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Research paper

Factors Affecting Bankruptcy in Malaysian Listed Companies

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Abstract

In a number of studies bankruptcy has been known to bring about the downfall and embarrassment of firms as well as destroying a lot of careers. On the other hand for bankruptcy of corporate institutions, factors such as accounting aspects that include, profitability, leverage as well as liquidity are mainly the core of this issue as mentioned by Boettcher, Cavanagh, and Xu (1). Nowadays corporate governance has been added into the mix. In order to support both affected and smoothly running firms, it is crucial for researchers to investigate all the aspects of the management of the firm as expressed in their annual reports. The methods focused on in this research includes the models such as, multicollinearity, polled least square model and finally the fixed effect model. The annual reports and indexes were used to get values in the measurements. This study found that corporate governance, firm size and profitability were not significant to the bankruptcy of the firm. However, Liquidity and leverage contributed to firm bankruptcy. In conclusion, this study is generally meant to explore the impact of different factors that probably contributed to bankruptcy among Malaysian firms.

Keywords: *Bankruptcy; corporate institutions; corporate Governance; size; profitability; leverage and liquidity*

1. Introduction

There had been several studies that explored different factors that affect the probability or the risk of bankruptcy as shown by Al-Kassar and Soileau (2). In their study, some these factors included profitability, level of debt and liquidity. In a study by Peat(3), it were mentioned that there was a lack of a theory to explain bankruptcy. However, researchers had resorted to statistical variable selection methods that had been derived from financial statements. In a recent study, Elshahat et al. (4), expressed that corporate governance could also possibly applied as a complete or full measure for some of the problems that affected the firm structure and its ability to survive directly. Researchers such as Daily (5), had recorded a distinct reduction in the number of outside directors in the years before a firm file for bankruptcy and also found that these studies showed that a notably large amount of progress had been made in setting up a relationship between board composition and bankruptcy.

Bankruptcy can generally be described as a legal status where an entity is unable to repay its creditors. In a recent study, Maere et al. (6), claimed that a firm's bankruptcy can greatly increase the costs incurred by shareholders, creditors, as well as the firm's own employees. According to Liang, Lu, Tsai and Shih (7), a combined set of internal and external control systems and processes will allow shareholders to oversee a firm to be able to optimize the firm's value in order to generate the planned return on each of their shareholdings.

1.1. Problem Statement

Corporate bankruptcy has become a distressing issue in the Malaysian corporate industry. According to statistics, the Central Bank reported that Malaysian bankruptcies had increased to 1668 companies in June from 1621 companies as of May 2015. The Star online reported that a lot of the incidents of bankruptcy in Malaysia came about due to the sale and purchase of vehicles and housing loans. However, it were also expressed by Jo-Lyn that out of the 101,537 cases handled by the Insolvency Department, from 2011 to 2015, 11,899 cases were due to business loans which then brings into question all internal aspects of these institutions.

This study needs to be done to find what factors and how much of an influence they had when dealing with financially distressed or bankrupt companies as indicated by Manzaneque, Priego and Merino (8). Recent research studies on this issue had been mainly carried out in the United States of America such as by Maere, Jorissen and Uhlaner (6), who suggested that successful overseeing of a firm's management may help in reducing the increasing cases of bankruptcy. Therefore, there is a definite need to study the different factors affecting the probability of bankruptcy in Malaysian firms.

Akbar, Poletti-Hughes, El-Faitouri and Shah (9), found that several corporate governance attributes had been linked to operating performance and the evidence found suggests that majority of these variables are strongly related to the probability of bankruptcy. Chan, Chou, Lin and Liu (10), considered that people in charge of making policies may consider setting up laws that help in the creating of a corporate firm's monitoring mechanisms which business men and companies may use to improve their own finances, governance and compensation techniques and mechanisms respectively, to evade financial bankruptcy. It were also expressed by Fich and Slezak (11), that equity ownership in firms may create motivation for management to draw in behaviour that decreases value the firm when in a distressed state.

Elshahat et al. (4), reported that variables that include, Board of Director's characteristics, internal control, board committee and auditing systems bring forth more awareness of the firms' corporate governance. Among the characteristics of corporate governance, Rauterkus, Rauterkus and Munchus, (12), suggested that companies that had just had a change in their CEO are not as likely to file bankruptcy. In addition to evidence, similarly Bonnier

and Bruner (13, 14), reported a notably positive price change to the retiring off of CEOs of firms that had been performing defectively for a while. In a recent study, Amedzro(15), mentioned that corporate governance of a company is represented by the Board of Directors and it is assumed that there is connection between it and the economic bankruptcy of a company. Finally, the evidence obtained shows that several studies had been done to explore the different factors that had an effect on the probability of bankruptcy and either increasing or reducing the risk of bankruptcy of corporate institutions as indicated by Al-Musali and Ismail (16).

1.2. Research Objectives

Main objectives of this study:

- To examine the effect of corporate governance on bankruptcy in Malaysian firms.
- To determine the effect of firm size, profitability, leverage and liquidity on bankruptcy in Malaysian firms.

1.3. Significance of Study

The research on bankruptcy assists in providing information to the investor to look out for while deciding when, how much and whether to invest in a particular firm. Chee, Ying, Chyi, Siang and Leong (17), concluded that a high bankruptcy rate may usually indicate a poor economic condition in a country, therefore the investors need as much information on the governance of the firms they are investing in so as not to make losses. Secondly, this study is expected to help policy makers and financial institutions by understanding the aspects of financial position and governance of a firm that may affect the financial performance of a firm through and lead to its bankruptcy as mentioned by Maher and Andersson (18). Due to understanding these aspects, the policy makers can make better decisions in offering credit to firms that may be in danger of becoming financially distressed in the near future.

2. Literature Review

2.1. Corporate Governance as a Factor that Affects Bankruptcy

Corporate governance has been increasingly included and become topic of study all over the world. Earlier studies such by Daily and Dalton (19), had mentioned that corporate governance structures were seldom included in empirical assessments of factors related to the successful reorganisation during or after bankruptcy.

In addition, it is mentioned that corporate governance is often connected or associated with the structure of boards of companies. A lot of the conversation has been aimed at of the responsibility of non-executives in a company, separate chairmen and remuneration, audit and nominating committees. Hilaire (15) who considered Board of Directors the cornerstone of corporate governance, developed a visual model for the analysis of the responsibility of boards of a company in corporate bankruptcy as expressed in the figure below.

As evidence, (7), identified some of these indicators such as board structure, cash flow rights, ownership structure, key person retained and many others. Fich and Slezak (11), and Shamsudin and Kamaluddin (20), stated that corporate governance may bring about possibly good effects on the possibility of bankruptcy occurrence given the degree of the firm's distress and these include that the odds the firm has of evading bankruptcy depends on the good response of the firm's management to a given level of distress as shown by Abdullah (21).

Another positive effect is identified by Noordin et al. (22), who state that since corporate boards mainly handle monitoring and advising, is that firms that had a larger number of external directors are less risky facing bankruptcy issue. This is because it were found that external directors are more superior in monitoring which is more important. In the same report, Darrat et al.(23) also found that companies that had more diverse boards are not as likely to file for bankruptcy due to a positive connection between the heterogeneity of boards and operating performance found in Adams and Ferreira's (24), study on women in the boardroom and their effect on governance and performance. However, Darrat et al (23) observed that the impact of corporate governance is not particularly constant across different firms and that universal governance may end up becoming counterproductive. In their study (23) found that non-bankrupt firms may not be able to explain the how some of the governance features play a role in situations in which there is a high possibility of a firm going bankrupt.

2.2. Firm Size as a Factor That Affects Bankruptcy

Trigueiros (25), concluded in a study that the seeking of an exact definition of firm size is judged by many as utopic, either because it is hypothesized that size may be multi-dimensional or because size is considered to be fundamentally an unclear concept. Wijn and Bijnen (26), added to this by stating that until now there has been no proof of the statement that the risk of bankruptcy is higher in smaller firms. However, there had been some recorded effects of firm size on bankruptcy found by several researchers and these a described below.

On the note of economic climate, Kim and Burnie (27), expressed that stock prices are heavily influenced by firms' future earnings and that with small firms having greater risks compared to larger firms their stock prices may be lower leading to attraction of less equity financing. In addition to this Gonzalez and Gonzalez (28), reported that the disagreements between creditors and shareholders had a worse effect on small firms compared to larger firms because the management team of these firms usually consists of large shareholders who are more likely to switch from one investment project to another. In a study, Chen and Chen (2011)(29), found that large firms often had better reputations due to their greater popularity and proportionally lower expected bankruptcy cost as a fraction of assets. On the other hand, Ni, Kwak and Cheng (30), and Pettengill and Lander (31), observed that smaller firms having smaller firms had a higher risk of going bankrupt due to not well established cumulative profits and the fact that they are not well known makes it harder for them to enter the stock market.

2.3. Profitability as a Factor That Affects Bankruptcy

In a report, Lopucki (32) developed a model which predicts that one of the factors that determine the outcome of the bankruptcy reorganization process is firm profitability. In addition, Daily and Dalton (33), and Campbell (34), also found past profitability to be an important factor distinguishing firms that successfully reorganize from those that liquidate. For instance, Altman (35), commented that a firm that has recorded a significantly poor profitability and solvency in its books for a given period of time may be regarded as a potential bankrupt.

A number of aspects and formulas in past studies had been used in measuring profitability of a firm. For instance, according to Campbell (34), asset profitability were measured by debtor's return on assets for the first month of operations. Back, Laitinen, Sere and Wezel expressed that the estimation of the company's debts being higher than the estimation of its assets, may lead to considering the company bankrupt. On the contrary, the company can keep its ongoing operations working even though this process does not lead always to a failure of a liquidated company, it is a clear indication of continuing operations of a company that is no longer profitable. The particular failure expressed here is considered as solidity bankruptcy.

2.4. Leverage as a Factor that Affects Bankruptcy

Soloski (36), contributed to the leverage formula through reporting that lenders use debt ratio as shown below to measure a company's ability to settle its debts over the long term and to evaluate the risk of a company not being able to pay its debts. A higher the ratio indicates that a company is more levered and thus a higher possibility of defaulting and increasing probability of bankruptcy.
There were emphasis in (37), research that the market value of a firm's equity is a more accurate estimation of its odds compared to the book value of equity. Therefore, market leverage's ability to foresee the risk of bankruptcy likely demonstrates the common knowledge that firms with lower debt financing are more able to pay off their debts. To add to this, when a firm has significantly high costs of bankruptcy, it has more motivation to reduce its bankruptcy risk by taking safety measures. For instance, adopting low target leverage or partaking in project of lower risk as mentioned George and Hwang's (38), report. Therefore, Tian et al. (37), concluded that book leverage has a negative relationship with the risk of bankruptcy probably because it is an alternative for preventative measures taken by firms to decrease their risk of going bankrupt.

2.5. Liquidity as a Factor that Affects Bankruptcy

Liquidity is one of the variables that were noted as a significant indicator of corporate bankruptcy problems in past research. These include Altman (1968)(35), who identified three different liquidity ratios to be used in evaluation, the most important being the Working Capital /Total Assets ratio which evaluates the net liquid assets of the firm relative to the total capitalization. Diamond (1991)(39), defined liquidity risk as the risk that a solvent but illiquid borrower firm is not able to get funds to finance his activities. He adds that liquidity risk surfaces from debt that has of shorter period to maturity than assets.
Bryan, Tiras and Wheatley (40), classified high long-term pressure as to companies that display a higher risk of solvency and classified short-term stress as to companies displaying a higher risk of liquidity. Together, Bryan et al. (40), noted that these two categories of risk are expected to represent the major basis of filing for bankruptcy and how much flexibility is offered to a firm once it becomes bankrupt. Working capital to total assets is considered by Bryan et al. (40), and Wu, Gaunt and Gray (41), to be the most widely used measure of liquidity, and that its explanatory power is evident in the existing bankruptcy literature. In their research Wu et al. , reported that the sample of bankrupt firms had lower working capital to total assets. The bankrupt firms also had higher current liabilities relative to current assets and were at a higher possibility of having negative net income over the 2 years. Bankrupt firms were also likely to have a lower number of funds from operations to total liabilities.
In more recent research, Karas and Reznakova (42), and Teador and Maria (43), described liquidity as the capability of a unit of the economy to fulfil its purpose at the time limit for the ratio between payment means and the due liabilities, with the funds that depend on its payment obligations. In this study, Teador and Maria (43), also identified the Quick ratio and Cash ratio also focused on to computing liquidity. The quick ratio emphasizes the capability of current assets with high liquidity to cover the current liabilities of the entity while the cash ratio involves a point at which liquid asset elements interact with short-term liabilities and it is as follows: In a nut shell, liquidity has been widely used and considered in bankruptcy based research studies as in Karas and Reznakova (42), and Jan and Marimuthi (44), who had all based on liquidity ratios such as the ones previously expressed an explained in order to gauge the effect liquidity may had had in bankruptcy cases.
The framework (Figure 1) for this research study includes 5 independent variables namely corporate governance, firm size, profitability, leverage and liquidity and the dependent variable being bankruptcy.

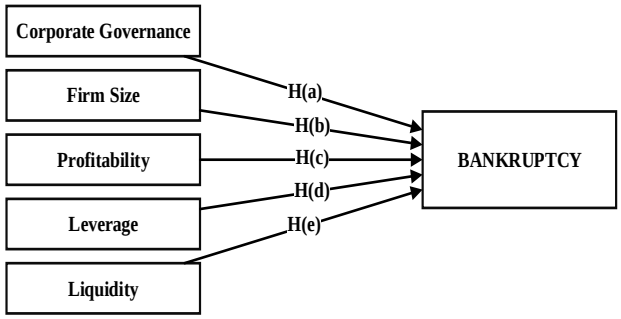

Fig. 1: Research Framework

3. Methodology

3.1. Data Specification

This section describes the data and its sources as well as the index of the variables. The data collected for analysis is for the period from 2006-2015 available for the chosen Malaysian firms. The corporate governance quality data will be extracted according to Malaysian Institute of Corporate Governance and the Minority Shareholder Watchdog Group from corporate governance survey reports Annual reports. Data for the independent variables profitability, leverage, firm size and liquidity will be got from the Annual Reports of the sample of companies listed in the Bursa Malaysia website.
To explore the different variables that affect bankruptcy the cross-sectional regressions take the following form:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$
$$BK = a + b_1CG + b_2FS + b_3PROFIT + b_4LEV + b_5LIQUID$$

Where:

BK	=	Bankruptcy as measured by Altman Z-Score
CG	=	Corporate Governance as measured by Number of BODs, Number of meetings and Ratio of executive to non-executive directors.
FS	=	Firm Size as measured by total assets.
PROFIT	=	Profitability as measured by Return on Assets.
LEV	=	Leverage as measured by the Debt ratio.
LIQUID	=	Liquidity as measured by the Current ratio.

The sample of firms focused on are the available 130 companies listed in Bursa Malaysia's Consumer Products Stock sector.

4. Findings

This section is meant to provide the logic behind the implementation of different procedures used in identifying and analysed the information related to comprehension of the research problem, therefore, allowing the critical evaluation of the research project's overall validity and reliability.

4.1. Descriptive Statistics

A brief description of each of the models to be used is provided in Table 1 below:

Table 1: Summary Statistics for All Variables

Variable	Mean	Std. Dev.	Min	Max
Altman Z-Score	160.965	411.846	-86.7653	5184.59
No. Of BODs	7.34303	1.94077	3.00000	17.0000
No of Meetings	4.98677	1.31016	1.00000	17.0000
Ratio of Exec to Non exec	3.35983	1.43075	0.110000	7.60000
Firm Size	18.6158	1.14453	12.2259	23.1863
ROA (%)	4.25612	57.7489	-1592.65	747.657

Debt ratio (%)	17.0499	38.0704	0.0120000	1052.94
Liquidity	84.2561	271.154	0.000000	4352.50

The above table represents the summary statistics using 119 observations in a period of 10 years i.e 2006-2015. The observations were originally 130, but 11 were deleted due to having more than 5 years of data missing from the reports to be used the analysis. All the observations are public listed companies listed in Bursa Malaysia's Consumer Products Stock sector. Below is an explanation of the results presented in the summary or descriptive statistics.

The dependent variable, bankruptcy, is represented in the Altman Z-Score. The average result for all companies were found to be 160.965 while the standard deviation were found to be 411.846. The minimum Z-score found were -86.7653 and the company found to had this score were Xinghe Holdings Berhad in the year of 2013. The maximum Z-score were found to be 5184.59 which were recorded by the company MSM Malaysia Holdings Berhad in the year of 2011.

Firstly, corporate governance were represented by three factors picked from the Malaysian Corporate Governance (MCG) Index. This included firstly, the Number of Board of Directors which had an average of 7.34303 and a standard deviation of 1.94077. The minimum number of BODs were found to be 3 which were recorded by Amtek Holdings Berhad (2006-2007) and Paragon Union Berhad (2009-2010). The maximum number of BODs were recorded as 17 which were recorded by Wang-Zheng Berhad (2006-2013). Secondly, the Number of meetings which had an average of 4.98677 and a standard deviation of 1.31016. The minimum number of meetings were 1, recorded by Xidelang Holdings Limited while the maximum number meetings were 17, recorded by UMW Holdings Berhad . Lastly, the ratio of Executive to Non-executive directors which had average of 3.35983 and a standard deviation of 1.43075. The minimum ratio were 0.11 recorded by Fraser & Neave Holdings Berhad (2013-2014) while the maximum ratio were 7.6 recorded by CCK Consolidated Holdings Berhad (2006-2010).

Secondly, firm size were measured by total assets which were expressed in the natural logarithm of the numbers. Where the average total assets were 18.6158 and the standard deviation were recorded as 1.14453. The minimum level of total assets were found to be 12.2259 recorded by Xinghe Holdings Berhad in 2013 while the maximum level of total assets were found to be 23.1863 recorded by PPB Group Berhad in the year 2012. Thirdly, profitability were represented by the Return on Assets (ROA) as shown in the above table 4.1. The average Return on Assets were found to be 4.25612% and the standard deviation were found to be 57.7489%. The minimum Return on Assets were found to be -1592.65% which were recorded by Xinghe Holdings Berhad in 2013 while the maximum level of total assets were found to be 747.657% recorded by C.I. Holdings Berhad in the year 2012. Fourthly, leverage were measured using the Debt ratio, i.e the percentage of Debt to Total assets. The average Debt ratio were found to be 17.0499% and the standard deviation were found to be 38.0704%. The minimum Debt ratio were found to be 0.012% recorded by MSM Malaysia Holdings Berhad in the year 2011 while the maximum Debt ratio were found to be 1052.94% recorded by Xinghe Holdings Berhad in the year 2013.

Finally, the liquidity were measured using Current ratio, i.e the ratio of current assets to current liabilities. The average current ratio were found to be 84.2561 while the standard deviation were recorded as 271.154. The minimum current ratio were found to be 0.000 which were recorded by Xinghe Holdings Berhad in the year 2013. The maximum current ratio were found as 4352.50 which were recorded by Magni-Tech Industries Berhad in the year 2015.

4.2. Correlation Analysis

The correlation analysis done among the independent variables in this study. This analysis will quantify the association between one independent variable with and another. If there are no variables above 0.7, all the independent are included in the analysis and in this case, all variables were included. Below is a description of the findings in the table.

The corporate governance variable as mentioned earlier were represented by Number of BODs, Number of meetings and ratio of executive to non-executive directors. The number of BODs having a correlation of 0.2410 with firm size, 0.1128 with ROA, -0.0711 with debt ratio and 0.0315 with liquidity. This suggests a positive relationship between with firm size, ROA and liquidity but a negative relationship with debt ratio. No. of meetings is shown to had a correlation of 0.0652 with firm size, -0.1509 with ROA, 0.1679 with debt ratio and -0.0463 with liquidity. This suggests a positive relationship with firm size and debt ratio while it has a negative relationship with ROA and liquidity. Ratio of executive to non-executive directors is seen to had a correlation of -0.0366 with firm size, 0.0391 with ROA, 0.0880 with debt ratio and 0.0732 with liquidity. This shows a positive relationship with ROA, debt ratio and liquidity but a negative relationship with firm size. According to these results corporate governance is seen to had a stronger positive relationship with all the other independent variables.

The firm size independent variable measured by total assets, found a correlation of 0.2787 with ROA, -0.0170 with debt ratio, -0.0507 with liquidity, 0.2410 with Number of BODs, 0.0652 with Number of meetings and -0.0366 with ratio of executive to non-executive directors. These results suggest a positive relationship with ROA and overall corporate governance, the strongest being with ROA while a negative relationship is suggested with debt ratio and liquidity, the weakest being with debt ratio.

The profitability independent variable measured by Net Income/Total assets, found a correlation of 0.1128 with Number of BODs, -0.1509 with Number Of meetings, 0.0391 with ratio of executive to non-executive directors, 0.2787 with firm size, -0.06850 with debt ratio and finally 0.0290 with liquidity. This all suggests a positive relationship with firm size, overall corporate governance and liquidity with the strongest being with firm size while a negative relationship were found with debt ratio.

The final variable being leverage measured by Total liabilities/Total Assets, found a correlation of -0.0711 with Number Of BODs, 0.1679 with Number of meetings, -0.0880 with ratio of executive to non-executive directors, -0.0170 with firm size, -0.6850 with ROA and finally -0.1318 with liquidity. This presents only a negative relationship between debt ratio and all the other independent variables, with the weakest relationship being with firm size and the strongest being with ROA. The liquidity independent variable represented by the current ratio, found a correlation of 0.0315 with Number of BODs, -0.0463 with Number of meetings, 0.0732 with ratio of executive to non-executive directors, -0.0507 with firm size, 0.0290 with ROA and finally -0.1318 with debt ratio. These suggest a positive relationship with corporate governance and ROA with the strongest relationship being with corporate governance while a negative relationship were found with firm size and debt, with the weakest being with firm size.

4.3. Ordinary Least Square

The Ordinary Least Square model is to be used to test the relationship between 2 variables consist of an independent and dependent variable. In this section the proof of the hypothesis stated in the methodology will be shown to find out the level of significance between each independent variable with the dependent variable, bankruptcy.

The P-value is found to be 1.1e-202 which is less than 1% significance level R-Squared value were 0.573023 which meant that approximately 57.30% of the variation in the bankruptcy could be explained by the variation in independent variables which are

corporate governance, firm size, profitability, leverage and liquidity. F (7,1124) value were found to be 215.4947 and finally Durbin-Watson value were 0.605218 according to the Pooled Ordinary Least Square model. Below is a description of the relationships represented by the values.

4.4. Pooled Least Square Analysis for Corporate Governance and Bankruptcy

Corporate governance represented by Number of BODs, Number of meetings and Ratio of executive to non-executive directors produced the following results. The number of BODs with coefficient 0.447404 is positively related to bankruptcy, No.of meetings with coefficient -5.39963 is negatively related to bankruptcy while Ratio of executive to non-executive directors with coefficient 4.24598 is positively related to bankruptcy. This means that an increase in Number of BODs and Ratio of executive and non-executive directors leads to an increase in probability of bankruptcy while a increase in Number Of meetings reduces the probability of bankruptcy and vice-versa. However, numerical results show p-value is 0.94383 for Number of BODs, 0.27500 for Number of meetings and 0.59127 for Ratio of executive to non-executive directors. These values are all shown to be well above a 10% significance level. Generally, this indicates that there is no statistically significant correlation between overall corporate governance and bankruptcy in Malaysian firms, therefore corporate governance does not significantly affect bankruptcy. The hypothesis rejected is:
H_1(a): Corporate governance significantly affects bankruptcy.
The hypothesis accepted in this case is:
H_0(a): Corporate governance does not significantly affect bankruptcy.

4.5. Pooled Least Square Analysis for Firm Size and Bankruptcy

Firm size represented by total assets produced the following results where the firm size were found to had a coefficient of 21.289 which shows that firm size is positively related to bankruptcy. This means that an increase in firm size (total assets) leads to an increase in the probability of bankruptcy. This positive relationship between firm size and bankruptcy were also mentioned in studies by Jovanic (1982)(45); Watson and Everett ; Farinas and Moreno (46), and finally Fich and Slezak (11). However, numerical results show firm size to had a p-value of 0.13944 which more than 10% significance level. This indicates that there is no statistically significant correlation between firm size and bankruptcy in Malaysian firms and firm size does not significantly affect bankruptcy. Therefore, hypothesis rejected in this case is:
H_1(b): Firm size significantly affects bankruptcy.
The hypothesis accepted is:
H_0(b): Firm size does not significantly affect bankruptcy.

4.6. Pooled Least Square Analysis for Profitability and Bankruptcy

Profitability represented by ROA produced the following results. The ROA were found to had a coefficient of -0.90521 which shows that profitability is negatively related to bankruptcy. This means that an increase in profitability (ROA) leads to a reduction in the probability of bankruptcy. This negative relationship between profitability and bankruptcy were also found in studies by Altman (35); Lennox (47); Beaver et al (48), and finally Abor (49). However, numerical results show ROA to had a p-value of 0.01501 which is at a 5% significance as represented in the table by the symbol (**). This indicates that there is a statistically significant correlation between profitability and bankruptcy in Malaysian firms, therefore profitability significantly affects bankruptcy because p-value is less than 10%. The hypothesis rejected in this case is:
H_0(c): Profitability does not significantly affect bankruptcy.
The hypothesis accepted is therefore:
H_1(c): Profitability significantly affects bankruptcy.

4.7. Pooled Least Square Analysis for Leverage and Bankruptcy

Leverage represented by Debt ratio produced the following results. The Debt ratio is seen to had a coefficient of -1.72131 which shows that leverage is negatively related to bankruptcy. This shows that an increase in leverage (debt ratio) leads to a decrease in the probability of bankruptcy in a firm. This negative relationship between leverage and bankruptcy were also shown in studies by, Kraus and Litzenburger (50); Miller (51), and finally Bongini et al (52). However, numerical results show Debt ratio to had a p-value of 0.00090 which is at a 1% significance as represented in the table by the symbol (***). This indicates that there is a statistically significant correlation between leverage and bankruptcy in Malaysian firms, therefore leverage significantly affects bankruptcy because p-value is less than 10%. The hypothesis rejected in this case is:
H_0(d): Leverage does not significantly affect bankruptcy.
The hypothesis accepted is therefore:
H_1(d): Leverage significantly affects bankruptcy.

4.8. Pooled Least Square Analysis for Liquidity and Bankruptcy

Liquidity, represented by the current ratio produced the following results. The liquidity is seen to had coefficient of 1.08802 which shows that liquidity is positively related to bankruptcy. This means that an increase in the liquidity of a firm leads to the increase in probability of bankruptcy. This positive relationship between liquidity and bankruptcy were also found in studies by John(53), and Barniv et al (54). However, liquidity were found to had a p-value of <0.00001 which is at a 1% significance as represented the table by symbol (***). This indicates that there is a statistically significant correlation between liquidity and bankruptcy in Malaysian firms, therefore liquidity significantly affects bankruptcy because p-value is less than 10%. The hypothesis rejected in this case is:
H_0(e): Liquidity does not significantly affect bankruptcy.
The hypothesis accepted is therefore:
H_1(e): Liquidity significantly affects bankruptcy.

4.9. Fixed Effect Analysis

Based on Table 2, the test for differing group intercepts P-value were found to be less than 1% therefore, null hypothesis which says Ordinary Least Square (OLS) model is appropriate, is rejected. Thus, Fixed Effect model is found to be more appropriate.
The fixed effect model is generally used to explore the relationship between dependent and independent variables within an entity. Each entity has its own individual characteristics that may or may not influence the dependent variable. The R-Squared value were found to be 0.78532 which meant that according to this model, approximately 78.53% of the variation in the bankruptcy could be explained by the variation in independent variables corporate governance, firm size, profitability, leverage and liquidity. F (125, 1006) value were 29.44051, Durbin-Watson value were 1.212775 and finally the overall P-value (F) were 3.9e-260 hence, ($p < 1\%$) according to fixed effect model. Below is a description of the results on the relationships found between each independent variable and the dependent variable presented using the coefficients and p-value.

Table 2: Fixed Effect Analysis Table

	Coefficient	Std. Error	t-ratio	p-value
const	207.81	334.495	0.6213	0.53457
No. Of BODs	-4.25204	11.9272	-0.3565	0.72154
No. Of Meetings	-5.45903	4.02515	-1.3562	0.17533
Ratio of Exec to non-exec	7.58602	17.5378	0.4326	0.66543
Firm Size	-5.11063	18.3197	-0.2790	0.78033
ROA	-0.206746	0.149611	-1.3819	0.16731
Debt ratio	-0.505303	0.272284	-1.8558	0.06378(
Liquidity	1.03661	0.111818	9.2704	<0.00001***
R-Squared	0.78532	**P-value(F)**		3.9e-260
F(125, 1006)	29.44051	**Durbin-Watson**		1.212775

* Significance at level of 10%
** significance at the level of 5%
*** significance at the level of 1%

Test for differing group intercepts -
Null hypothesis: The groups had a common intercept
Test statistic: F(118, 1006) = 8.43085
with p-value = P(F(118, 1006) > 8.43085) = 9.83689e-089

Hypothesis for the models

H_0 : Ordinary Least Square model is appropriate
H_1 : Fixed Effect model is appropriate

4.10. Fixed Effect Model Analysis for Corporate Governance and Bankruptcy

In this model, corporate governance represented by Number of BODs, Number of meetings and Ratio of executive to non-executive directors produced the following results. It were found that the Number of BODs with a coefficient -4.25204 is negatively related to bankruptcy, Number of meetings with coefficient -5.45903 is negatively related to bankruptcy while Ratio of executive to non-executive directors with coefficient 7.58602 is positively related to bankruptcy. Therefore according to this model, an increase in Ratio of executive to non-executive directors leads to an increase in probability of bankruptcy while a increase in Number of BODs and Number of meetings reduces the probability of bankruptcy and vice-versa. This result is evidenced by Yermack (55), and Eisenberg, Sundgren, and Wells (56), who reported a negative relationship between board size and the performance of a firm. However, numerical results show p-value is 0.72154 for Number of BODs, 0.17533 for Number of meetings and 0.66543 for Ratio of executive to non-executive directors. These values are all shown to be well above a 10% significance level. This provides an indication that there is no statistically significant correlation between overall corporate governance and bankruptcy in Malaysian firms, therefore corporate governance does not significantly affect bankruptcy. The hypothesis rejected is:

H_1(a): Corporate governance significantly affects bankruptcy.

The hypothesis accepted in this case is:

H_0(a): Corporate governance does not significantly affect bankruptcy.

4.11. Fixed Effect Model Analysis for Firm Size and Bankruptcy

Firm size represented by total assets produced the following results. The firm size were found to had a coefficient of -5.11063 which shows that firm size is negatively related to bankruptcy. This means that an increase in firm size (total assets) leads to a reduction in the probability of bankruptcy. This negative relationship between firm size and bankruptcy were also mentioned in studies by Weiss (57); Wijn and Bijn (26), and finally Beck et al (58). However, numerical results show firm size to had a p-value of 0.78033 which is more than 10% significance level. This indicates that there is no statistically significant correlation between firm size and bankruptcy in Malaysian firms and firm size does not significantly affect bankruptcy. Therefore, hypothesis rejected in this case is:

H_1(b): Firm size significantly affects bankruptcy.

The hypothesis accepted is:

H_0(b): Firm size does not significantly affect bankruptcy.

4.12. Fixed Effect Model Analysis for Profitability and Bankruptcy

Profitability represented by ROA produced the following results. The ROA were found to had a coefficient of -0.206746 which shows that profitability is negatively related to bankruptcy. This means that an increase in profitability (ROA) leads to a reduction in the probability of bankruptcy. This negative relationship between profitability and bankruptcy were also found in studies by Altman (35); Lennox (47); Beaver et al (48), and finally Abor (49). However, numerical results show ROA to had a p-value of 0.16731 which is more than a 10% significance. This indicates that there is no statistically significant correlation between profitability and bankruptcy in Malaysian firms, therefore profitability does not significantly affect bankruptcy because p-value is more than 10%. According to the Fixed Effect model, the hypothesis rejected in this case is:

H_0(c): Profitability significantly affects bankruptcy.

The hypothesis accepted is therefore:

H_1(c): Profitability does not significantly affect bankruptcy.

4.13. Fixed Effect Model Analysis for Leverage and Bankruptcy

Leverage represented by Debt ratio produced the following results. The debt ratio is seen to had a coefficient of -0.505303 which shows that leverage is negatively related to bankruptcy. This shows that an increase in leverage (debt ratio) leads to a decrease in the probability of bankruptcy in a firm. This negative relationship between leverage and bankruptcy were also shown in studies by, Kraus and Litzenburger (50); Miller (51), and finally Bongini et al (52). However, numerical results show Debt ratio to had a p-value of 0.06378 which is at a 10% significance as represented in the table by the symbol (*). This indicates that there is a statistically significant correlation between leverage and bankruptcy in Malaysian firms, therefore leverage significantly affects bankruptcy because p-value is less than 10%. The hypothesis rejected in this case is:

H_0(d): Leverage does not significantly affect bankruptcy.

The hypothesis accepted is therefore:

H_1(d): Leverage significantly affects bankruptcy.

4.14. Fixed Effect Model Analysis for Liquidity and Bankruptcy

Liquidity, represented by the current ratio produced the following results. According to Table 2, liquidity is seen to had coefficient of 1.03661 which shows that liquidity is positively related to bankruptcy. This means that an increase in the liquidity of a firm leads to the increase in probability of bankruptcy. This positive relationship between liquidity and bankruptcy were also found in studies by John (1993)(53), and Barniv et al (54). However, liquidity were found to had a p-value of <0.00001 which is at a 1% significance as represented the table by symbol (***). This indicates that there is a statistically significant correlation between liquidity and bankruptcy in Malaysian firms, therefore liquidity significantly affects bankruptcy because p-value is less than 10%. The hypothesis rejected in this case is:

H_0(e): Liquidity does not significantly affect bankruptcy.

The hypothesis accepted is therefore:
H_1(e): Liquidity significantly affects bankruptcy.
In conclusion, according to the Fixed Effect model only the independent variables leverage and liquidity were found to significantly affect bankruptcy while corporate governance, firm size and profitability did not significantly affect bankruptcy. It were also found that the only liquidity had a positive relationship with bankruptcy while other independent variables were found to be negatively related to bankruptcy.

5. Implications

In terms of implication for investors, the factors affecting the probability of bankruptcy are very important. This study gives a clear understanding of what aspects of a company that investors must explore before making a decision about where to put their money. This study also shows that investors should consider non-financial factors such as corporate governance in making investment decisions. This is because proper management and monitoring is key to the stability and growth of a firm's financial positions. This study has provided a framework for policy makers and financial institutions that provide debt financing for corporate firms to consider when setting benchmarks and laws or rules for lending. Based on the literature review, this study has found that there are definite links between liquidity policies pursued by managements of firms and probability of bankruptcy. The findings from this study had definite implications to the managements of corporate firm. Firstly, this study is able to provide the implication of the highs and lows of different aspects of a firm. For instance, managers are able to know a firm's probability of success or distress from watching the trend in profitability, liquidity, leverage and total assets and therefore making the appropriate decisions in their different sectors of the firm. The results from analysis found that liquidity had significant effect on bankruptcy therefore, managers should keep an eye on their levels of current assets and current liabilities at all times. This study can also provide managers with a starting point in creating risk management procedures and programs for respective firms.

6. Conclusion

Bankruptcy is a serious issue that has negatively affected a number of firms in Malaysia. The purpose of this study were to investigate factors that had effect on the probability of bankruptcy in Malaysian firms. The determinants included in this study had been, corporate governance, profitability, firm size, profitability, leverage and finally liquidity. All the data were collected from the year of 2006 to 2015 from the annual reports of sample companies listed in consumer products stock sector of Bursa Malaysia and various empirical analyses were carried out to support the theoretical framework.
The results revealed that according to the Ordinary Pooled Least Square model only three of the hypotheses were supported while only two hypotheses were supported according to the Fixed Effect model. The results also discovered that the independent variables had been able to explain 57.3% of the variance in bankruptcy in the first model and 78.53% of the variance in bankruptcy in second model substantially. In addition, this study found that liquidity had a larger influence on the probability of bankruptcy compared to the other variables. Based on findings, this study also found that corporate governance, firm size and profitability are not significant factors that affect the probability of bankruptcy. In a nutshell, the objective to identify the factors that affect the probability of bankruptcy in Malaysian firms had been met. This research has provided valuable information to the relevant parties such as policy makers, corporate managements, investors as well as financial institutions to increase their awareness towards the determinants leading to bankruptcy.

References

[1] Boettcher J, Cavanagh G, Xu M. Ethical Issues that arise in Bankruptcy. Business and Society Review. 2014;119(4):473-96.
[2] Al-Kassar TA, Soileau JS. Financial performance evaluation and bankruptcy prediction (failure) 1. Arab Economic and Business Journal. 2014;9(2):147-55.
[3] Peat M. Factors affecting the probability of bankruptcy: A managerial decision based approach. Abacus. 2007;43(3):303-24.
[4] Elshahat I, Elshahat A, Rao A. Does Corporate Governance Improve Bankruptcy Prediction? Academy of Accounting and Financial Studies Journal. 2015;19(1):107.
[5] Daily CM. Governance patterns in bankruptcy reorganizations. Strategic Management Journal. 1996:355-75.
[6] De Maere J, Jorissen A, Uhlaner LM. Board capital and the downward spiral: Antecedents of bankruptcy in a sample of unlisted firms. Corporate Governance: An International Review. 2014;22(5):387-407.
[7] Liang D, Lu C-C, Tsai C-F, Shih G-A. Financial ratios and corporate governance indicators in bankruptcy prediction: A comprehensive study. European Journal of Operational Research. 2016;252(2):561-72.
[8] Manzaneque M, Priego AM, Merino E. Corporate governance effect on financial distress likelihood: Evidence from Spain. Revista de Contabilidad. 2016;19(1):111-21.
[9] Akbar S, Poletti-Hughes J, El-Faitouri R, Shah SZA. More on the relationship between corporate governance and firm performance in the UK: Evidence from the application of generalized method of moments estimation. Research in International Business and Finance. 2016;38:417-29.
[10] Chan C-Y, Chou D-W, Lin J-R, Liu F-Y. The role of corporate governance in forecasting bankruptcy: Pre-and post-SOX enactment. The North American Journal of Economics and Finance. 2016;35:166-88.
[11] Fich EM, Slezak SL. Can corporate governance save distressed firms from bankruptcy? An empirical analysis. Review of Quantitative Finance and Accounting. 2008;30(2):225-51.
[12] Rauterkus A, Rauterkus S, Munchus G. Effect of board composition on firm bankruptcy: An empirical study of United States firms. International Journal of Management. 2013;30(2):767.
[13] White MJ. The corporate bankruptcy decision. The Journal of Economic Perspectives. 1989;3(2):129-51.
[14] Bonnier K-A, Bruner RF. An analysis of stock price reaction to management change in distressed firms. Journal of Accounting and Economics. 1989;11(1):95-106.
[15] Amedzro St-Hilaire WG. Regulation and corporate governance. Role of deficiencies of boards in the bankruptcy of industrial and commercial crown corporations. Revue Sciences de Gestion. 2011(80).
[16] Al-Musali MAKM, Ku Ismail KNI. Board diversity and intellectual capital performance: The moderating role of the effectiveness of board meetings. Accounting Research Journal. 2015;28(3):268-83.
[17] Ong ML, Cheang WC, Tsen EJY, Low HC, Ng HS. Factors of consumer bankruptcy: A case study in the United States: UTAR; 2015.
[18] Maher M, Andersson T. Corporate governance: effects on firm performance and economic growth. 2000.
[19] Daily CM, Dalton DR. Corporate governance and the bankrupt firm: An empirical assessment. Strategic Management Journal. 1994;15(8):643-54.
[20] Shamsudin A, Kamaluddin A. Impending Bankruptcy: Examining Cash Flow Pattern of Distress and Healthy Firms. Procedia Economics and Finance. 2015;31:766-74.
[21] Nahar Abdullah S. Board structure and ownership in Malaysia: The case of distressed listed companies. Corporate Governance: The international journal of business in society. 2006;6(5):582-94.
[22] Noordin N, Zakaria Z, Sawal MZHM, Ngah K, Hussin ZH. Bankruptcy among young executives in Malaysia. Insight. 2012;28:132-6.
[23] Darrat AF, Gray S, Park JC, Wu Y. Corporate governance and bankruptcy risk. Journal of Accounting, Auditing & Finance. 2016;31(2):163-202.
[24] Adams RB, Ferreira D. Women in the boardroom and their impact on governance and performance. Journal of financial economics. 2009;94(2):291-309.

[25] Triqueiros D, editor A Theoretical Definition and Statistical Description of Firm Size. Annual Conference of the British Accounting Association; 2000.
[26] Wijn MFCM, Bijnen EJ. Firm size and bankruptcy elasticity. Tilburg University, School of Economics and Management, 2001.
[27] Kim S-J. Corporate leverage, bankruptcy, and output adjustment in post-crisis East Asia. 1999.
[28] González VM, González F. Firm size and capital structure: evidence using dynamic panel data. Applied Economics. 2012;44(36):4745-54.
[29] Chen L-J, Chen S-Y. The influence of profitability on firm value with capital structure as the mediator and firm size and industry as moderators. Investment Management and Financial Innovations. 2011;8(3):121-9.
[30] Ni J, Kwak W, Cheng X, Gong G. The determinants of bankruptcy for Chinese firms. Review of Pacific Basin Financial Markets and Policies. 2014;17(02):1450012.
[31] Pettengill GN, Lander DM. Response of the Cost of Equity to Leverage: An Alternative Perspective. Journal of Business Strategies. 2015;32(2):110.
[32] LoPucki LM. The Debtor in Full Control--Systems Failure Under Chapter 11 of the Bankruptcy Code. Am Bankr LJ. 1983;57:99.
[33] Daily CM, Dalton DR. Bankruptcy and corporate governance: The impact of board composition and structure. Academy of Management journal. 1994;37(6):1603-17.
[34] Campbell SV. Predicting bankruptcy reorganization for closely held firms. Accounting Horizons. 1996;10(3):12.
[35] Altman EI. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. The journal of finance. 1968;23(4):589-609.
[36] Soloski J. Collapse of the US newspaper industry: Goodwill, leverage and bankruptcy. Journalism. 2013;14(3):309-29.
[37] Tian S, Yu Y, Guo H. Variable selection and corporate bankruptcy forecasts. Journal of Banking & Finance. 2015;52:89-100.
[38] George TJ, Hwang C-Y. A resolution of the distress risk and leverage puzzles in the cross section of stock returns. Journal of Financial Economics. 2010;96(1):56-79.
[39] Diamond DW. Debt maturity structure and liquidity risk. The Quarterly Journal of Economics. 1991;106(3):709-37.
[40] Bryan DM, Tiras SL, Wheatley CM. The interaction of solvency with liquidity and its association with bankruptcy emergence. Journal of Business Finance & Accounting. 2002;29(7-8):935-65.
[41] Wu Y, Gaunt C, Gray S. A comparison of alternative bankruptcy prediction models. Journal of Contemporary Accounting & Economics. 2010;6(1):34-45.
[42] Karas M, Režňáková M. Bankruptcy prediction model of industrial enterprises in the Czech Republic. International journal of mathematical models and methods in applied sciences. 2013;7(5):519-31.
[43] Teodor H, Maria AT. Aspects Concerning The Determination Of Bankruptcy Risk By Solvency And Liquidity Ratios In The Companies Listed On The Bucharest Stock Exchange. THE ANNALS OF THE UNIVERSITY OF ORADEA. 2014:630.
[44] Jan A, Marimuthu M. Bankruptcy and sustainability: A conceptual review on islamic banking industry. Global Business and Management Research. 2015;7(1):109.
[45] Jovanovic B. Selection and the Evolution of Industry. Econometrica: Journal of the Econometric Society. 1982:649-70.
[46] Farinas JC, Moreno L. Firms' growth, size and age: a nonparametric approach. Review of Industrial organization. 2000;17(3):249-65.
[47] Lennox CS. The accuracy and incremental information content of audit reports in predicting bankruptcy. Journal of Business Finance & Accounting. 1999;26(5-6):757-78.
[48] Beaver WH, McNichols MF, Rhie J-W. Have financial statements become less informative? Evidence from the ability of financial ratios to predict bankruptcy. Review of Accounting studies. 2005;10(1):93-122.
[49] Abor J. The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. The journal of risk finance. 2005;6(5):438-45.
[50] Kraus A, Litzenberger RH. A state-preference model of optimal financial leverage. The journal of finance. 1973;28(4):911-22.
[51] Miller BH. Sovereign bankruptcy: examining the United States bankruptcy system as a forum for sovereign debtors. Law & Pol'y Int'l Bus. 1991;22:107.
[52] Bongini P, Ferri G, Hahm H. Corporate bankruptcy in Korea: Only the strong survive? Financial Review. 2000;35(4):31-50.
[53] John TA. Accounting measures of corporate liquidity, leverage, and costs of financial distress. Financial Management. 1993:91-100.
[54] Barniv R, Mehrez A, Kline DM. Confidence intervals for controlling the probability of bankruptcy. Omega. 2000;28(5):555-65.
[55] Yermack D. Higher market valuation of companies with a small board of directors. Journal of financial economics. 1996;40(2):185-211.
[56] Eisenberg T, Sundgren S, Wells MT. Larger board size and decreasing firm value in small firms. Journal of financial economics. 1998;48(1):35-54.
[57] Weiss LA. Bankruptcy resolution: Direct costs and violation of priority of claims. Journal of Financial Economics. 1990;27(2):285-314.
[58] Beck T. Financial and legal institutions and firm size: World Bank Publications; 2003.