CORPORATE GOVERNANCE AND BANKRUPTCY

Master Thesis

Author : Hapsari Dhamayanti

Student Number : 431148

Supervisor : Dr. J. Yu

Accounting, Auditing, and Control

Accounting and Finance

Erasmus School of Economics

Erasmus University Rotterdam

ABSTRACT

The purpose of this paper is to investigate the debate regarding the influence of corporate governance structure on the probability of bankruptcy. Specifically, the effect of board size, proportion of female board of director, and proportion of independent board of directors, in the bankruptcy exposure. This paper uses sample of 190 bankrupt companies and healthy companies during the period of 2000-2014. The result shows that having smaller boards reduces the probability of bankruptcy. The result of this paper is consistent with the belief that these types of corporate governance structure lead to better monitoring.

ACKNOWLEDGMENT

First, I would like to say thank you to Dr. J. Yu, who has patiently given me feedbacks and motivation during my thesis completion process.

Next, I must express my gratitude toward my beloved parents and my sister who keep encourage and motivate me to do my best in this master thesis – I therefore dedicate this thesis to them.

Finally, I would also like to thank all my friends in Indonesia and Netherlands who have never stop to support me through the entire process of this master thesis.

TABLE OF CONTENT

Corporate Governance and Bankruptcy

Chapter 1: Introduction

1.1 Introduction

Bankruptcy is an impactful event that no firm ever wants to experience. Bankruptcy happens when a corporate is unable to fulfil its obligations and applies for a period of time of relief to reorganize its debs or to liquidate its assets to the federal court (Bryan, Fernando, and Tripathy, 2013). Bankruptcies can have negative consequences for the firm. Bryan et al. (2013) use the bankruptcy of General Motor as an illustration. They explain that after bankruptcy, the shareholders lost their share's value, bondholder got only small portion for their investment, and retired employee's health benefits were cut. Some units were closed, resulting in job cut off. From the bankruptcy consequences, it is important to identify the cause that leads to bankruptcy.

Bankruptcy has often been discussed and investigated in the recent years. While there has been attention related to corporate bankruptcy in the accounting and finance literature, focus has been mainly on predicting bankruptcy based on financial data (e.g. Beaver, 1966; Altman, 1986). Though this phenomenon having already been observed in recent high-profile bankruptcy events, there is only few research that includes the relation of corporate governance on the bankruptcy risk (e.g. Daily and Dalton, 1994; Fich and Slezak, 2008). Hence, it is an open empirical question how the relation of corporate governance to the likelihood of bankruptcy.

Cochran and Wartick (1998) in Maassen, (1999) explain that corporate governance is focuses on the connection between boards, stockholder, top management, regulators, auditors, and other stakeholders. Fich and Slezak (2008) argue that corporate governance has two potential effects on the probability of bankruptcy. The first reason is that after the recent scandal of Enron and WorldCom, it becomes clear that financial and accounting data can be manipulated to mask bad performance. Second, since firm's governance structure represents a nexus of incentive contracts, the efficacy of management response to distress will depend upon the characteristic of firm's governance structure. Therefore, although it may be harder to avoid bankruptcy the greater the distress, the likelihood of avoiding bankruptcy will also depend on the management's

respond to a given level of distress, which conceivably depends on the firm's governance structure.

Previous studies examine bankruptcy risk based on financial and accounting data, ignoring information about the firms' governance characteristics (Altman, 1968; Beaver, 1966). Based on Daily and Dalton (1994), boards with many outsider directors are more likely to take action to prevent further performance declines or, ultimately bankruptcy itself, while according to the previous study from Fich and Slezak (2008), larger and more independent boards are less likely to be associated with bankruptcy. However, only very few studies test the efficacy of governance structures within distressed firms, while this could have an influence on the probability to file for bankruptcy. Governance structures, more specifically characteristic and proportion of board directors may have an influence on the probability to file for bankruptcy because of their big role on the firm's strategy implementation and decision making. In order to better understand how characteristic and composition of board directors could affect the probability of a firm to go bankrupt, I conduct this study.

The purpose of this study is to investigate how the probability of bankruptcy is associated with board characteristics, as a proxy for corporate governance mechanism. Thus, research questions are as follows:

RQ1: Is the bankruptcy probability associated with the board size?

RQ2: Is the bankruptcy probability associated with the proportion of female director?

RQ3: Is the bankruptcy probability associated with the proportion of independent director?

Board size is measured by referring to the number of board. Proportion of female director is measured by the percentage of women director on board. Proportion of independent director is measured by the percentage of independent (that is, non-management) directors on the board.

The association of corporate governance and bankruptcy risk has received attention since Beaver (1966), which using univariate analysis along with a paired-

sampling method to distinguish the bankrupt and solvent firms. Extending the univariate model, Altman (1968) construct a multivariate model to predict the risk of bankruptcy, while other studies have also used Chapter 11 as representation of bankruptcy (Altman, 2000; Betker, 1995; Fich and Slezak, 2008; Gilson and Vestuypens, 1993). To distinguish this study from the previous studies, I collect only those firms that have filed for bankruptcy under Chapter 11. The choice to use the Chapter 11 bankruptcy is to ensure homogeneity in the bankruptcy amongst the firms, in other word, avoid selection bias.

Firms which have filed for bankruptcy under Chapter 11 are available through UCLA LoPucki Database. Data on corporate governance is available through the ISS. I also use SEC EDGAR to complete the corporate governance data that not available from the ISS. Financial statement variables for control variables are available through the COMPUSTAT Fundamentals Annual database. The sample period starts from 2000 through 2014, which is the latest year available from the WRDS.

1.2 Relevance and Contribution

This study contributes to the stream of bankruptcy which is still limited but growing in number. Following the finding of Bryan, Fernando, & Tripathy (2013) and Elloumi & Gueyie (2001), this study provides more evidence about the association of corporate governance on the probability of bankruptcy. Furthermore, this study also contributes to the stream of corporate governance especially board characteristics literature by providing the evidence that board size is associated with the probability of bankruptcy and reinforce the finding of prior literatures (Darrat, Gray, Park, and Wu, 2016; Fich and Slezak, 2008; Platt and Platt, 2012).

The results of this study will benefit financial analysts, investors and accounting professionals. The positive effect between board size and bankruptcy risk and probability of bankruptcy can help internal and external party to evaluate the bankruptcy risk. Furthermore, my result may also give guidance to company to reconstruct their board of directors in order to reduce their bankruptcy risk.

1.3 Summary Findings

As indicated earlier, there are two streams of literature related to this study. The first one is bankruptcy and the second one is corporate governance. There are four to six main studies and several other studies that help the development of the hypotheses to answer the research questions. Regarding the bankruptcy literatures, there are studies by Beaver (1966), Altman (1968), and Shumway (2001), while studies on corporate governance include those by Daily and Dalton (1994), and Fich and Slezak (2008). This section provides more insight into how prior studies form the basis for the hypotheses development of this thesis.

Table 1: Summary Findings

Authors	Objective of Study	Variables	Results
Beaver (1966)	Provide empirical verification of the usefullness of accounting data as predictor of failure of the firm	Cash-flow ratios, Net-income ratios, Debt to total asset ratios, Liquid asset to total asset ratios, Liquid asset to current debt ratios, Turnover ratios	Ratio analysis may provide useful information, but must be used with discretion: 1. Not all ratios predict equally well 2. The ratios don't predict failed and non failed firms with the same degree of success
Altman (1968)	Assess the quality of ratio analysis as an analytical technique with the prediction of corporate bankruptcy as illustrative case	Working capital/total asset, retained earning/total asset, EBIT/total asset, market value equity/book value of total debt, sales/total asset	combining multiple ratios unto a compound model provide better accuracy than traditional ratio analysis.
Shumway (2001)	Propose a model that uses both accounting ratios and market driven variable to produce more accurate bankruptcy forecast.	Altman's independent variables, Zmijewksi's variables, market driven variables	Market driven variables improves explanatory power of bankruptcy prediction model, and Hazard model outperform static model e.g MDA (Altman, 1968)
Daily and Dalton (1994)	Determine whether board composition and board leadership structure contributed to corporate bankruptcy	CEO/board chair structure, board composition, number of independent directors	Governance structure does contribute to the incidence of bankruptcy beyond financial and size consideration
Fich & Slezak (2008)	Document how governance characteristics affect firm's ability to avoid bankruptcy and the power of financial/accounting information to predict bankruptcy	Governance variable, general and firm specific economic condition variable, financial/accounting variable	Distressed firm's governance characteristics significantly affect its probability of bankruptcy, and governance characteristics enhances the power of financial accounting models in predicting bankruptcy

This table provides information regarding the previous studies that help the hypotheses development of this study.

1.4 Structure

The remainder of this thesis is structured as follows. The second chapter provides reference to prior literature review regarding bankruptcy and board of directors. This chapter discusses the prior literature regarding the bankruptcy and bankruptcy risk. Next, previous studies related to role of board of directors in the company are explained. The last part of this chapter reviews the correlation of board of directors with probability of bankruptcy.

The third chapter provides hypotheses development. This chapter discuss prior studies and describe the development of the hypotheses. First sub sub-chapter discloses the prior studies and hypothesis development of variables board size. Next, it explains the prior studies and hypothesis development of variables proportion of female director. Lastly, it explains the prior studies and hypothesis development of variables proportion of independent director.

The next chapter discusses the conceptual framework of this study, the data variables along with the theoretical reason, and the regression model used to test the hypotheses. The last section of this chapter discusses the sample used in this study and lists of the step that used to collect and process the data.

The fifth chapter describe the descriptive statistic of the research data, the logistic regression model and the assumption of the main finding, apart from elaborating the result and their comparison with prior literature, as well as how the result answer the research questions and examine the hypotheses. This chapter contains tables showing the regression results.

The last chapter explain the conclusions from derived from the regression results. It also provides an overview of previous studies related to the results and discussing the limitation of this research and the suggestion for the further research.

Chapter 2: Literature Review

2.1 Bankruptcy

Beaver (1966) defines failure as the inability of a company to pay its financial obligation. A company is considered to have failed when it faces bankruptcy, bond default, overdrawn bank account, or nonpayment of a preferred stock dividend. Bankruptcy has been an interesting topic for researcher to investigate, because it is an extreme event that can have far-reaching consequences for the firm as well as its stakeholders. The consequences of bankruptcy can be identified as reorganization of the management team, or reduced market share, and loss of trust from different stakeholders (Bryan, et al. 2013). Employees also face different costs when their firm faces bankruptcy; they could get fired from reorganization, their salaries are likely to drop and lose their pensions (Graham, et al., 2013).

Concluding from these consequences and costs, it is important to understand the causes of bankruptcy. During the past decades, several researchers have developed models to assess the likelihood of bankruptcy. These studies generally try to form a model by comparing matches samples of non-bankrupt and bankrupt firms, using publicly available information from financial statements in order to estimate the likelihood of these firms filing for bankruptcy at some point (Wu, et al., 2010).

An early study from Beaver (1966) uses financial-statement data as a predictor failure. This study finds that ratio analysis may provide useful information in predicting the likelihood of bankruptcy. However, ratio must be used with discretion, because not all ratios can predict equally well, and the ratios did not predict failed and non-failed company with the same rate of success. Further study from Altman (1968) attempts to use the quality of ratio analysis as an analytical technique to predict bankruptcy, known as Altman Z-score. He argues that traditional ratio analysis is no longer an important analytical technique because the unsophisticated manner in which it has been presented. He also explains that his model proved to be accurate in predicting bankruptcy by 94% of the initial sample.

In addition of prior bankruptcy literature, Daily and Dalton (1994) add the effect of corporate governance to the likelihood of company bankruptcy. They find that board

structure and leadership structure have an effect on the incidence of bankruptcy. The result shows that corporate governance, especially board of directors, serves as internal control tool in the company (Walsh and Seward, 1990).

2.2 Chapter 11 Bankruptcy

Company that become insolvent yet want to stay in operation may be able to file a Chapter 11 bankruptcy. Based on note from the US States Courts: "An individual cannot file under 11 or any other chapter if, during the preceding 180 days, a prior bankruptcy petition was dismissed due to the debtor's willful failure to appear before the court or comply with orders of the court or was voluntarily dismissed after creditors sought relief from the bankruptcy court to recover property upon which they hold liens. In addition, no individual may be a debtor under chapter 11 or any chapter of the Bankruptcy Code unless he or she has, within 180 days before filing, received credit counseling from an approved credit counseling agency either in an individual or group briefing. There are exceptions in emergency situations or where the U.S. trustee (or bankruptcy administrator) has determined that there are insufficient approved agencies to provide the required counseling. If a debt management plan is developed during required credit counseling, it must be filed with the court"

Similar to personal reorganization, Chapter 11 lets company to obtain protection from their creditors meanwhile they assemble a repayment plan. In a reorganization under Chapter 11, the existing managers of the company usually remains in control and the firm continue to operate. As White (1989) argues, reorganization plan must be adopted to settles the claims of all pre-bankruptcy creditors. To give a company more chance at achieving profitability, liabilities can be reduced and restructured.

2.3 The Role of Board of Directors

According to Cochran and Wartick (1998), corporate governance is an umbrella term that contain many aspects related to the theories and practices of board of directors and their executive and non-executive directors. They explain that corporate governance is a nexus of contracts between boards, stockholder, top management, regulators, auditors, and others stakeholder (Maassen, 1999). Maassen (1999) explains that boards of directors are essential in most definition of corporate governance. There are numerous of previous literature that use boards of directors as the proxy of their studies (Yermack,

1996; Sharma, 2004; Elloumi and Gueyie, 2001), considering the important role of the boards of directors. Hillman and Dalziel (2003) state that boards of directors have two roles, monitoring role and provision of resource role. First, monitoring role refers to the responsibility of directors to monitor managers on behalf of shareholders, such as monitoring the CEO (Daily, 1996), monitoring strategy implementation (Pitcher, Chreim, and Kisfalvi, 2000), and evaluating and rewarding the CEO of the firms (Conyon and Peck, 1998). Second, provision of resource role refers to the ability of the board to bring resource to the firm, such as providing expertise (Baysinger and Hoskisson, 1990), administering advice and counsel (Lorsch and MacIver, 1989), and assisting in the formulation of strategy or other important firm decision (Judge and Zeithaml, 1992).

An early study by Baysinger and Butler (1985) analyze the relation between board directors and firm value. They test the relationship between the percentage of independent directors and a relative measure of return on equity. They find that boards with more outsiders outperformed other firms but that a majority of independent directors was not necessary to insure above average value. Study from Yermack (1996) shows that small board of director is more effective. Companies with smaller board also has more favorable values for financial ratio, has stronger CEO performance incentives from compensation and threat of dismissal. He explains that smaller board has better communication, coordination and decision-making process than the larger board, study from Eisenberg, Sundgren and Wells (1998) also justify these finding. Years later, Carter, Simkins, and Simpson (2003) examines the association between board diversity and firm value. They find positive relation between fraction of women and firm value. They provide evidence that diverse board promotes better understanding of the marketplace, increase creativity and innovation, produce effective problem-solving, enhance the effectiveness of corporate leadership, and promotes global relationship (Robinson and Dechant, 1997).

Besides numerous studies examining the relation between board of directors and firm performance, there is also a study that discovers the association between board director and the likelihood of corporate fraud. Study from Beasley (1996) result shows that the percentage of independent or outside directors significantly reduces the likelihood of fraud, study from Sharma (2004) also justify these finding. She finds that the likelihood of corporate fraud has negative relation with the percentage of independent directors on

board of directors. She also finds that the likelihood of corporate fraud is negatively related to institutional shareholder. She indicates that strong corporate governance plays a role in monitors and controls function in reducing fraud.

Another study in the board of director streams is Elloumi and Gueyie (2001). They want to determine whether board structure and board composition lead to an explanation of company's financial distress status in Canadian company, more specifically percentage of board member who are considered outside directors, and board duality. They find that board of directors has a role in company's financial distress.

This all together emphasizes again the important role of the board of directors in a firm and that they have indeed an influence on the wellbeing of a firm.

2.4 Board of Directors and Bankruptcy

The boards of directors serve as a firm's internal monitoring mechanisms in a corporate governance process (Walsh and Seward, 1990). Mizruchi (1983) claims that the board of director is the ultimate center of control of a firm. Further, Louden and Zusman (1982) argues that as highest decision-making body in the firms, the board is responsible to maintain the long-term health and survival of the firm. The association between corporate governance structure and financial distress that lead to bankruptcy exists because financial distress is not a discrete event, rather it is a late stage of a ''protracted process of decline'' and a ''downward spiral'' (Hambrick and D'Aveni, 1988). Daily and Dalton (1994b) show that in the year of bankruptcy filing, financial indicators (profitability, liquidity and leverage) explain 95.54 percent of their bankruptcy model. Thus, a stronger board should be able to devise appropriate strategies to correct the downward trends faced by the firm.

An effective board of directors should have led and monitored companies appropriately and designed the risk management mechanisms to ensure the companies are not exposed to excessive financial risks that could lead to it becoming financially distressed. Fich and Slezak (2008) believe that smaller and more independent boards induce more effective monitoring. They examine the relation of corporate governance and bankruptcy by estimating hazard model conditional on accounting information for both conditions, with and without corporate governance. They indicate that, firms in poor

governance are less able to make necessary adjustment to avoid bankruptcy. Another study from Chan, Chou, Lin, and Liu (2016) incorporate additional variables representing internal and external corporate governance mechanism to improve the current predictive power of the financial bankruptcy. From the result of their empirical analysis, they suggest that corporate governance proxy, the size of compensation committee, and executive compensation should be included as bankruptcy prediction model.

Study from Darrat, Gray, Park, and Wu (2016) find that larger board reduces the likelihood of bankruptcy on complex firm. It implies that larger board provides more networks, knowledge, more experience and expertise. They also find that CEO tenure, more diverse board, and firm that recently replaced their CEO are less likely to file for bankruptcy, while firms with more powerful CEOs are more likely to file for bankruptcy. Their empirical analysis suggests that the additional explanatory power from corporate governance variables becomes stronger as the time to bankruptcy is increased, implying that even though corporate governance variables are important as predictors, governance change are likely to be too late to save the company on the verge of bankruptcy.

Another perspective that explains the association of board directors on bankruptcy risk is resource dependency that sees board directors, specifically outside director as provider of external resource (Burt, 1983). Assigning representatives from significant outside constituencies as outside directors is viewed as ‘‘. . . a strategy for managing organizations’ environmental relationships’’ (Daily and Dalton, 1994b). Hence, these outside directors are expected to play active roles in making sure the firm not to face bankruptcy risk.

Chapter 3: Hypotheses Development

3.1 Board size and Bankruptcy

Board size refers to the number of member in the board of directors. Board size is a characteristic of board structure that has been covered in numerous literatures. It is considered to have an important impact on the performance of the board. Prior research shows that large board is beneficial for their firms. First, the more board of director in the company, the better connected the firm is to critical resources (Pfeffer and Salancik, 1978: 172). Second, larger board is likely to reduce the probability of bankruptcy. They believe that larger board brings wider knowledge and better expertise to the company (Darrat, Gray, Park, and Wu, 2016). Other scholars suggest that the size of a board may have implications for the level of board independence (Muth and Donaldson, 1998; Zahra and Pearce, 1989), as a smaller group of directors may be more easily influenced by the CEO as a result of social cohesion. By contrast, a larger board is less easily dominated by the CEO as it may require more time and effort on the part of the CEO to build consensus.

However, other papers argue that smaller board is more effective than larger boards. The first reason is that smaller board of directors associated with better firm performance, due to reduced coordination, communication and free-rider problems (Yermack, 1996). Secondly, smaller boards are more competent at improving value of company in the time of distress (Fich and Slezak, 2008). Large boards may also develop coalitions that lead to group conflicts which make it more difficult to reach consensus (Goodstein, Gautam, and Boeker, 1994). During a crisis, a tendency to react indecisively might threaten the existence of firms (Daily and Dalton, 1994). Another implication of large boards is concerned with social loafing. Social loafing refers to a decrease in efforts exerted by directors as board size increases (Kidwell and Bennett, 1993). Furthermore, Mintzberg (1983) suggests that large fragmented diverse boards are easily manipulated and dominated by the CEO.

Thus, it is difficult to predict whether and how board size is associated with the bankruptcy likelihood. Thus, my hypothesis is stated in a null form.

H1: board size does not have association with the probability of bankruptcy

3.2 Proportions of Female Director and Bankruptcy

Proportion of Female Director refers to percentage of female director in the board. There are growing studies that examined the notion of having female director inside the boards. The arguments that lies behind the idea that board diversity improves a competitive advantage of a firm are based on intuitive reasoning and are articulated by Robinson and Dechant (1997). First, it is argued that the more diverse board, the better the understanding of consumers preference by matching the diversity of a firm's directors to the diversity of its potential customers and employees. Second, it is argued that diverse board increase creativity and innovation because these characteristics are not randomly distributed among the population but tend to vary systematically with demographic variables such as gender. Third, it is argued diverse board can enhance the capacity for problem-solving as the variety of perspectives that emerge from a more diverse board allow more alternatives to be observed.

However, there are other research that point out that the female directors may not necessarily result in more effective monitoring if women directors are marginalized and conclude that there is no reason to expect greater female director enhance board monitoring. There are also arguments that stating that greater female directors may reduce firm performance. Earley and Mosakowski (2000) suggest that members of homogeneous groups communicate more frequently as they are more likely to share the same opinions. Williams and O'Reilly (1998) agree with the previous finding, they argue that homogenous groups are more cooperative and face less emotional conflicts. Lau and Murnighan (1998) explain that when greater female director among board members generates more conflicting opinions, decision-making will be more time-consuming and less effective.

The previous arguments cover both positive and negative relation between female board appointments and firm performance. The current empirical evidence is also inconclusive because of the diverse methodologies and proxies. For example, Erhardt et al. (2003) and Adams and Ferreira (2009) find that female director has a positive effect, while Jehn and Bezrukova (2003) and Bøhren and Strøm (2005) accomplish the opposite. Finally, the studies of Shrader et al. (1997), Du Rietz and Henrekson (2000), and Rose (2007) are inconclusive on the issue. Prior studies show that it is difficult to predict the

relation between female director and firm performance. Nevertheless, these studies provide theories for this study as bankruptcy is an indication (or an outcome) of firm performance. Since there is no adequate number of studies that examine the effect having female director inside the board on the likelihood of corporate bankruptcy, it is worthwhile to examine this association. I propose a hypothesis in a null-form.

H2: proportion of female director does not have association with the probability of bankruptcy

3.3 Proportion of Independent Board and Bankruptcy

Proportion of independent board refers to the percentage of independent directors in the board. Based on Clarke (2007), the definition of independent director is: "one who has no need or inclination to stay in the good grace of management, and who will be able to speak out, inside and outside the boardroom, in the face of management's misdeeds in order to protect the interests of shareholder". Independent director has two roles inside the board, monitoring roles and provision of resources roles, according to their role, their supposed to increase the monitoring effectiveness and support the company with advices (Hillman and Dalziel, 2003).

There are numbers of study that support the existence of independent directors, for example, Nguyen and Nielsen (2010) investigate the reaction of stock price to sudden deaths and conclude that independent directors are generally viewed as being beneficial to the firm. Byrd and Hickman (1992) show that independent directors are more likely to remove CEO with bad performance. Fich and Slezak (2008) investigate the association between independent director and the filing of Chapter 11 bankruptcy. They lead to the conclusion that independent director has negative association with bankruptcy, which means independent directors decrease the likelihood of corporate bankruptcy. They argue that a company with more independent directors have more effective business adjustment while under distress rather than a company with more inside directors.

On the contrary, there are evidence of independent director ineffectiveness. Perry (1995) finds that independent directors may adversely impact the board cohesiveness because they play the roles of decision makers and monitors at the same time, which could lead to a conflict of interest. Chaganti & Sharma (1985) and Abdullah (2006) also find

that there is no relation between the board independence and the likelihood of bankruptcy. Chaganti & Sharma (1985) believe the result of their study happen because they only deal with one type of industry. They argue that proportion of independent director is not an important determinant of bankruptcy in the retailing industry. Prescriptions which universally recommend boards comprised of a majority of independent directors, therefore, overlook the inter-industry differences and their implications for board structure and performance.

Despite prior research on the association between board independence and bankruptcy likelihood, prior research is quite limited. For example, Chaganti & Sharma (1985) just focuses one industry, retail industry, so their results may not be generalized to other industries. Fich and Slezak (2008) use 508 distressed firms, but only 25 firms filed for bankruptcy, which may make the power of the research low to the point of unreliably showing the traits that are sought by the researcher. Thus, it is worthwhile re-examining this association. Given the mixed evidence of the prior research, I propose a hypothesis in a null-form.

> H3: proportion of independent director does not have association with the probability of bankruptcy

From the argument that stated above, the mixed results regarding the effect of corporate governance proxies to the bankruptcy suggest that further study is necessary.

Chapter 4: Research Design & Data

4.1 Conceptual Framework

The predictive validity framework or known as the Libby boxes is given below to show the conceptual relation tested in this research will be operationalized in the research design.

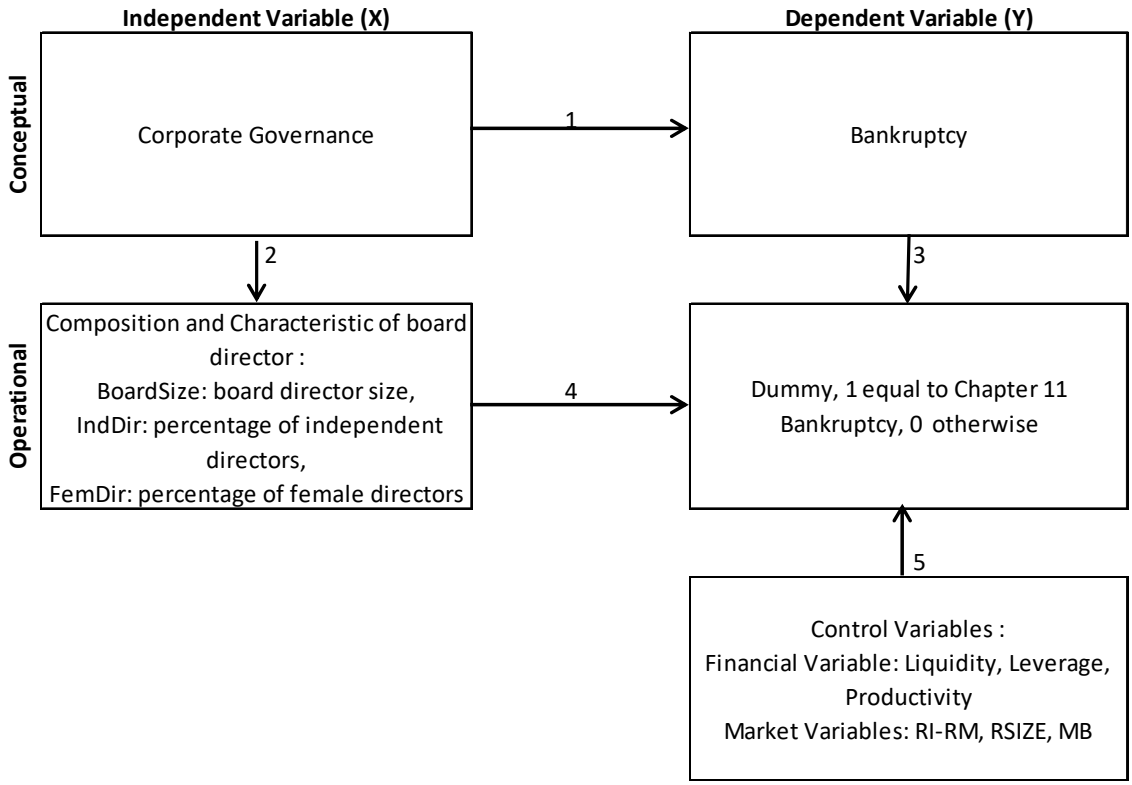

Figure 1: Predictive Validity Work (Libby Boxes)

The purpose of Libby Boxes is to help researchers make a framework that captures the concept and illustrate the research process (Libby, 1981). The Libby boxes contains of the following variables: conceptual, operational, independent, dependent, and control variables. It also has five arrows that define the relationship between each variable. The relation between the variable will be explained by the construct, internal, and external validity.

Libby, Bloomfield, & Nelson (2002) explain that Libby box starts with the construct validity that attempts to operationalize the abstract idea that can be measured. Arrow two and three in the figure one shows the construct validity. Arrow two operationalize corporate governance as a conceptual independent variable to an

operational independent variable, which is characteristic and proportion of board director. The variables corporate governance will be measured by the size of board, the proportion of female director, and proportion of independent director. The same for the conceptual dependent variable bankruptcy is captured by the operational dependent variable the filing for Chapter 11 bankruptcy. This is illustrated by arrow three in figure one. The arrow four shows the internal validity of the research. Internal validity is related to how well the study captures the relationship between the operationalized dependent and independent variable (Libby et al, 2002).

To measure why Chapter 11 bankruptcy happened, it is associated with corporate governance through the size of the board, the proportion of independent director, and the proportion of female director. Arrow five shows that there are some other factors that might impact the reason why Chapter 11 bankruptcy happen. Those variables are used as control variables to better understand the relation between Chapter 11 bankruptcy and corporate governance. Control variables might increase the internal validity, on account of the higher validity results in in better causal-effect relationship between Chapter 11 bankruptcy and corporate governance.

External validity shows how well the result of the research can be generalized beyond specific tasks, measurement method, and participant employed in the research (Libby et al,. 2002). The external validity is illustrated by arrow one in figure one that is represented by arrow four.

4.2 Variables

Following several previous studies, we regard failed firms as those that have filed for bankruptcy under Chapter 11 (Betker, 1995; Brockmann et al., 2004; Gilson & Vestuypens, 1993). This research uses dichotomous dependent variable, which is 1 for the company that files bankruptcy under Chapter 11, and 0 otherwise.

Board size, proportion of female director, and proportion of independent directors are the variable interest of this research. Board size is measured by the number member of the board, proportion of female director is measured by the percentage of women director on board, and proportion of independent director is measured by the percentage of independent director in the board director.

Additionally, two control variables are added in the research, Financial variables and Market-based variables. These control variables are used to control for other factors that might create a spurious association between some of the board director characteristics and bankruptcy. The financial variables reflect liquidity, leverage and productivity (Altman, 1968, Daily and Dalton, 1994). Liquidity, leverage and productivity are seen as the common financial causes of bankruptcy (Altman, 1968). Liquidity measured by dividing current asset and current liabilities. If a firm has a large amount of cash and current asset compared to its total assets, it is expected to be able to pay its short-term debts and it is less likely that it has to file for bankruptcy (Uhrig-Homborg, 2005). Therefore, this variable is expected to have negative association with the likelihood of bankruptcy. The next financial variable is leverage, which is the amount of total liabilities divided by total asset. If the amount of debt is relatively large, the probability that the firm will face liquidity issues and end up in financial distress is bigger (Uhrig-Homborg, 2005; Graham, et al. 2013). Hence, it is assumed that the relation between the stakeholder bankruptcy risk score and this control variable is positive. The last financial variable is productivity. Productivity is measured by dividing earning before interest and tax (EBIT) with total assets. Higher productivity enables companies to produce output by utilize less inputs, resulting in a cost savings. This savings can be passed onto customers in the form of lower prices, which lead to greater market share or retained within the company in order to enjoy greater margins (Bryan, Fernando and Tripathy, 2013). Based on the argument above, it can be assumed that higher productivity has negative relation with bankruptcy risk.

The market-based variables are adopted from Shumway (2001). He argues that his market-driven model can improves the predictive power of bankruptcy forecast. The first market-based variable is firm size (RSIZE). Firm size is important in predicting the likelihood of bankruptcy, because of the market equity of firms are close to bankruptcy is typically discounted by traders. Firm size is measured with the logarithm of each firm's size divided by size of the NYSE/AMEX market size. Firms with larger size have a lower probability of filing for bankruptcy (Shumway, 2001), so this variable is expected to have a negative influence on the bankruptcy risk. The second market-based variable is the annual excess return (RIRN). RIRN is measured by detract the return for the companies and the value weighted NYSE/AMEX index returns. If traders discount the equity of

firms that are close to bankruptcy, then a firm's past excess returns should predict bankruptcy as well as its market capitalization. Shumway (2001), argue that firms with lower annual excess return have bigger risk to face bankruptcy. Thus, it is assumed that the association between this control variable and bankruptcy risk is negative. The last market-based variable is market to book ratio. Market to book ratio capture the relative value placed of the company's equity by stockholders and by accountants (Darrat, Gray, Park, and Wu, 2016). A lower market to book ratio could mean that the stock is undervalued. Finding from Fama and French (1995) argue the market to book ratio is one of an indicator of distress. They explain that company with a low stock price relative to book value tend to be persistently distressed. Contrarywise, high stock price relative to book value is associated with sustained strong profitability. Consistent with prior research, it can be expected that the lower market to book ratio, the lower the bankruptcy risk.

4.3 Models

The purpose of this research is to estimates the effect of corporate governance to the likelihood of bankruptcy. To confirm the hypotheses, a statistical model is required to test the association between the dependent and the independent variable. This research uses dichotomous dependent variable, which is 1 for the company that file bankruptcy under Chapter 11, and 0 otherwise. From the nature of the dependent variable, this research uses Logit regression analysis because it is the appropriate procedure where disproportionate sampling from two different populations is used (Maddala, 1991). The Logit regression model is used to test the relation between the independent variables and control variables and the dependent variable. The independent variables are board's size, proportion of female director and proportion of independent board. Additionally, two control variables are added in the research, financial variables and market-based variables.

Based on the information above, the empirical model is constructed as follow

$$Bankruptcy = \alpha + \beta_1 * BoardSize_{it-1} + \beta_2 * FemDir_{it-1} + \beta_3 * IndDir_{it-1} + \beta_4 * FinancialVariable_{it-1} + \beta_5 * MarketVariable_{it-1} + \varepsilon$$

For company i in the year t, if they filed for Chapter 11 bankruptcy, Bankruptcy = 1 and if the company did not file the Chapter 11 bankruptcy, Bankruptcy = 0. All variables are listed in Appendix 1 in which the BoardSize is the number member of the board, FemDir is the percentage of women director on board and IndDir is percentage of independent director in the board director.

The financial variables reflect liquidity, leverage and productivity. Liquidity is measured by dividing current asset and current liabilities. Leverage is the amount of total liabilities divided by total asset, while productivity is measured by dividing earning before interest and tax to total asset. The market-based variables represent firm size, annual excess return and market to book ratio. Firm size is measured with the logarithm of each firm's size divided by size of the NYSE/AMEX market size. Annual excess return is measured by detract the return for the companies and the value weighted NYSE/AMEX index returns. Market to book ratio is the amount of market value equity divided by book value equity.

4.4 Sample & Data

Failed companies considered as those that have filed Chapter 11 bankruptcy. Data for the companies that have filed for Chapter 11 bankruptcy between 2000 and 2014 are collected from UCLA Lo-Pucki Bankruptcy Research Database. This database contains data on all large, public company bankruptcy cases filed in the United States Bankruptcy from October 1, 1979 (LoPucki, 2014). Financial companies are excluded from this research because they have different financial structure from the rest of the companies in our samples (Shumway, 2001).

The selecting process of sample is shown in Table 2 Panel A. After the dataset of bankrupt companies collected, data for corporate governance were selected from the Institutional Shareholder Services (ISS), if data is unavailable from the ISS, I manually retrieved it from the EDGAR database. Financial data were obtained from COMPUSTAT Fundamentals Annual database to calculate the liquidity and leverage, and market data were gathered from CRSP. Next, observations that do not have proper data of corporate governance characteristics and control variables were dropped. Then, this research gathered the matched company by the size of the companies and year. The final sample consists of 94 observations. Meanwhile, Panel B shows the sample times period for the

bankrupt company and the matched company based on the size and the year from 2000 to 2014.

Table 2: Sample Overview

Panel A: Sample Selection			
Total samples obtained from UCLA Lo-Pucki from the year 2000-2014	404		
Less observations with missing data from Institutional Shareholder Service (ISS)	(175)		
Less observations with missing data from Compustat	(88)		
Less observations with missing data from CRSP	(46)		
Total number of bankrupt firms	95	Total number of matched firms	95
Total samples	190		

Panel B: Samples Time Period Table		
Year	**Healthy Company**	**Bankrupt Company**
2000	8	8
2001	15	15
2002	13	13
2003	12	12
2004	8	8
2005	7	7
2006	2	2
2007	4	4
2008	5	5
2009	8	8
2010	2	2
2011	3	3
2012	3	3
2013	4	4
2014	1	1

This table provides information on the sample distribution by year, specifically the distribution for healthy company and bankrupt company

Chapter 5: Result

5.1 Descriptive Statistics

Table 3 describes the summary statistics of the healthy and bankrupt company sample. The sample consist of 95 healthy companies and 95 bankrupt companies, with total of 190 companies. The overview in the table provides the intuitive result that healthy company has a higher mean for all the variable mentioned, except Leverage. The higher value of Leverage on bankrupt company is aligned with the assumption that bankrupt company have a higher leverage ratio.

The average board size of healthy company 8,453, a minimum of 3 board members and a maximum of 15. The maximum number of board members in healthy company is relatively the same with the bankrupt companies. Most boards for both healthy and bankrupt companies are dominated by men and on average the proportion of female board members are 0,083 and 0,081, with minimum of 0 for both companies, and maximum of 0,6 and 0,429, consecutively. The independent directors form about 0,769, and 0,718 for healthy and bankrupt companies; this implies that the board of directors are dominated by independent directors. From the table it can be conclude that there is only a slight difference in the governance variables between the healthy company and bankrupt company. It explains that both healthy and bankrupt companies have relatively the same number of board, proportion of female directors, and proportion of independent directors.

For the financial variable, results show that bankrupt company has lower level of liquidity (1.243 versus 3,197 for healthy company). While the level of leverage in bankrupt company is significantly higher than the healthy company. The last financial variable is productivity, it can be concluded that the productivity value of healthy company is higher with 0.103 than the bankrupt company with -0,058. These results are in line with the general assumption that healthy company has higher liquidity, lower leverage and higher productivity than bankrupt company. The result of market-based variable shows that bankrupt company has lower past stock return (RIRN), lower level of relative size of a company (Rsize) and lower market to book ratio (MB) than the healthy company.

Table 3: Descriptive Statistics

Variables		N	Mean	Standard Deviation	Minimum	Maximum
BoardSize	Healthy	95	8,453	2,355	3	15
	Bankrupt	95	8,232	2,180	4	14
	Total	190	8,342	2,266	3	15
FemDir	Healthy	95	0,083	0,102	0,000	0,600
	Bankrupt	95	0,081	0,106	0,000	0,429
	Total	190	0,082	0,104	0,000	0,600
IndDir	Healthy	95	0,769	0,142	0,400	1
	Bankrupt	95	0,718	0,203	0,000	1
	Total	190	0,744	0,177	0,000	1
Liquidity	Healthy	95	3,197	2,356	0,564	13,884
	Bankrupt	95	1,243	0,981	0,034	5,419
	Total	190	2,220	2,049	0,034	13,884
Leverage	Healthy	95	0,497	0,247	0,045	1,690
	Bankrupt	95	0,974	0,306	0,002	1,785
	Total	190	0,736	0,366	0,002	1,785
RI-RN	Healthy	95	0,267	1,090	-2,399	6,305
	Bankrupt	95	-1,264	3,332	-13,681	6,568
	Total	190	-0,498	2,589	-13,681	6,568
Rsize	Healthy	95	0,172	0,243	0,013	1,624
	Bankrupt	95	3,620	11,457	0,013	75,279
	Total	190	1,896	8,264	0,013	75,279
Market	Healthy	95	2,494	2,886	-14,198	11,864
	Bankrupt	95	0,303	3,530	-19,363	25,940
	Total	190	1,398	3,398	-19,363	25,940
Productivity	Healthy	95	0,103	0,111	-0,302	0,446
	Bankrupt	95	-0,058	0,187	-1,252	0,190
	Total	190	0,022	0,173	-1,252	0,446

This table provides the descriptive statistics for variables in the main analyses. All variables are defined in the Appendix.

5.2 Pearson Correlation

Table 4 presents the Pearson correlation between the variables that are used in this research. The Pearson correlation is a measure of the strength of the linear relationship between two variables. If the relationship between two variables is not linear, then the correlation coefficient does not adequately represent the strength of the relationship between the variables (Lane, "Values of the Pearson Correlation", n.d.)

From this table, it can be seen that the correlation between size of board of director and proportion of female director to bankruptcy are small and insignificant. This means that large board and higher percentage of female directors do not necessarily tend to have correlation to bankruptcy. On the contrary, the variable InDir has significant correlation to bankruptcy with negative sign. The negative sign explains that company with higher proportion of independent director will have lower probability of bankruptcy. This outcome is in line with study from Fich and Slezak (2008) which argue that a company with more independent directors have more effective business adjustment while under distress rather than a company with more inside directors.

The coefficient on the Liquidity, Leverage, RIRN, and Rsize variables all have the expected sign, while MB has the opposite sign with negative sign. Liquidity are negatively related to bankruptcy, since company with higher liquidity have large amount of cash and current asset and expected to be able to pay their debt and less likely to face bankruptcy. Consistent with Uhrig-Homborg (2005), the leverage are also positive, considering the bigger the amount of debt in the company, the probability that the company will face financial distress is bigger. As expected RIRN, Rsize and MB variables are negatively correlated to bankruptcy.

Table 4: Pearson's Correlation

	BoardSize	FemDir	IndDir	Liquidity	Leverage	RI-RN	Rsize	MB	Poductivity	Bankruptcy
BoardSize	1,000									
FemDir	0,138	1,000								
IndDir	0,110	0,165*	1,000							
Liquidity	-0,243**	-0,019	-0,011	1,000						
Leverage	0,019	-0,094	-0,129	-0,539**	1,000					
RI-RN	0,019	0,035	0,310**	0,122	-0,233**	1,000				
Rsize	-0,018	-0,076	0,105	-0,164*	0,011	0,104	1,000			
MB	0,086	0,081	-0,003	0,125	-0,386**	0,115	-0,044	1,000		
Poductivity	-0,056	0,006	0,281**	0,168*	-0,353**	0,333**	-0,115	0,349**	1,000	
Bankruptcy	-0,049	-0,010	-0,143*	-0,478**	0,654**	-0,296**	-0,209**	-0,323**	-0,467**	1,000

Variables are defined in the appendix.
***,**,and *denote significance at the 1% ,5%,and 10% levels, respectively, based on two-tailed t test.

5.3 Logit Regression

The mean comparison analysis and the Pearson's correlation serve as preliminary analysis for this study's prediction on influence of board characteristics on probability of bankruptcy. The mean comparison analysis shows that the bankrupt companies have

different value characteristics from the explanatory variables. The Pearson's correlation also presents the correlation between the variables that are used in this research.

Following Shumway (2001), this research examines whether the board characteristics are associated with probability of bankruptcy by using logit model. The research question will be measured with the following logit regression model:

$$Bankruptcy = \alpha + \beta_1 * BoardSize_{it} + \beta_2 * IndDir_{it} + \beta_3 * FemDir_{it} + \beta_4 * FinancialVariable_{it} + \beta_5 * MarketVariable_{it} + \varepsilon_{it}$$

The model is estimated using samples of 95 bankrupt companies and 95 healthy companies, with total of 190 companies.

This research put the explanatory variables in the regression analysis, with the dependent variables. As seen on table presented below, the dependent variable (Bankruptcy) is regressed against board characteristics, financial variables and market variables of companies. Different regressions are performed with the governance variables and control variables, and also the regression of Bankruptcy against all variables in one model. Bankruptcy has binary outcome, 1 if the company is filing for chapter 11 of Bankruptcy, and 0 otherwise. The variable used in all model are the size of the board (BoardSize), the percentage of female director on the board (FemDir), the percentage of independent director on board (IndDir), financial and market-based control variables.

Table 5 : Logistic Regression Result

	Bankruptcy Model 1	Bankruptcy Model 2	Bankruptcy Model 3	Bankruptcy Model 4
BoardSize	-0,032	-0,323	0,082	-0,257
	0,632	0,017**	0,844	0,088*
FemDir	0,375	4,382	1,786	4,658
	0,795	0,113	0,357	0,200
IndDir	-1,681	-1,166	1,251	-2,387
	0,058*	0,550	0,114	0,306
Liquidity		-1,460		-1,142
		0,000***		0,000***
Leverage		5,626		6,769
		0,000***		0,000***
RI-RN			0,233	-1,304
			0,001***	0,007***
Rsize			0,700	1,762
			0,200	0,306
Productivity		-21,386		-0,044
		0,000***		0,724
MB			0,114	-20,725
			0,000***	0,000***
Constant	1,485	2,612	1,685	1,022
	0,070*	0,201	0,106	0,711

All variables are defined in Appendix 1.
*, **, *** denotestatistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Model one shows the regression of all governance variables, namely BoardSize, FemDir, and IndDir without the control variables. The result shows that the variable of IndDir is negatively significant toward the risk of bankruptcy in the level of 10%, while the other two variables are not. These results are in line with previous literature that the higher the proportion of independent director, the lower the risk of bankruptcy (Fich and Slezak, 2008).

The second logit regression model explain the regression of all governance variables and the financial variables, namely Liquidity, Leverage, and Productivity. The result shows by regressing the governance variables with the financial variables, the IndDir variable become insignificant, and in return, the BoardSize variable become statistically significant with beta of -0,323 at the level of 5%. Beside BoardSize, Liquidity and Productivity are also negatively correlated with the probability of bankrupt.

The third model include governance variables and market-based variables, namely RIRN, Rsize and MB. The regression result of this model indicates the insignificant correlation of all governance variables towards the bankruptcy risk, while the market-based variables, specifically RIRN and MB are significantly associated to the probability of bankruptcy.

Finally, Model four show the result of logistic regression of corporate governance variables including all of the control variables. As presented on the table above, when all variables regressed together, the variable of BoardSize is statistically significant at the level of 10%. The beta value of board size (BoardSize) is negative, which indicates that company with higher number of board of director has lower probability of being bankrupt. This result is consistent with study from Darrat, Gray, Park, and Wu, (2016). They argue that more members in the board of directors will bring more knowledge and better expertise towards the company. The enhanced advisory capacity of a larger board appears to be relatively more beneficial to company when they are under serious financial pressure. This outcome indicate that corporate governance structure partially has effect on company bankruptcy.

Meanwhile, the proportion of female director and proportion of independent director are not statistically significant. The proportion of female director is statisfically insignificant with positive beta value. This outcome is in line with the prior studies of of Shrader et al. (1997), Du Rietz and Henrekson (2000), and Rose (2007). They show that it is difficult to predict the relation between female director and firm performance. The proportion of independent director (IndDir) has a negative beta value and has insignificant relation towards bankruptcy risk. The possible explanation of this insignificant result is related to the level of information about the company that an independent director can have. Based on that possible explanation, independent directors are unable to make decision that can have good influence to the company since they are not fully involved in the company's day-to-day affairs. Hence, lack of company's information could lead to inadequate monitoring and decision making. The insignificance of InDir implies that the null hypothesis is accepted. This result is in line with the result of Chaganti & Sharma (1985) which also find that there is no relation between independent board and bankruptcy. Kumar & Sivaramakrishan (2008) also argue that as directors become less

dependent on CEO, the efficiency of monitoring decrease, resulting in worse financial outcome which could lead to bankruptcy.

In line with prior research, the Liquidity, Leverage, and RIRN are significant and have the predicted sign, while MB has the opposite sign with negative sign. Variable Liquidity (the ratio of total cash and current assets relative to total assets) proves to be statistically significant and have negative beta value at 1% level. This outcome suggests that company with large amount of cash and current asset has smaller chance of bankruptcy. The next variable is Leverage, which is the amount of total liabilities divided by total asset with a very high positive β value of 6,769 at 1% level. These statistic result suggest that leverage ratio of a company is positively correlated and has great impact on this probability. In line with the expectation and the trade-off theory, great level of leverage increases the probability of bankruptcy in the company. The variable RIRN refers to annual excess return (RIRN). RIRN is measured by detract the return for the companies and the value weighted NYSE/AMEX index returns. RIRN is significant and has high negative beta value of -1,304 at 1% level. This result suggests that RIRN has inverse relationship with probability of bankruptcy. The last significant variable is MB ratio. MB ratio (market-to-book ratio) has the opposite sign as expected, suggesting that the variable is negatively related to the probability of bankruptcy.

On the other hand, this study finds insignificant association between company's relative size towards the probability of bankruptcy. Previous studies found significant relation between annual excess return and the risk of bankruptcy. Shumway (2001) argues company with large, less volatile are saver than small, volatile company. However, this study finds there is no relation between company relative size and the risk of bankruptcy. Lastly, this study finds insignificant association between productivity and risk of bankruptcy as well. This result is very unexpected because there has been a number of studies that link productivity to the risk of bankruptcy (Altman, 1968; Altman, et al., 1977).

5.4 Additional Test using Backward Elimination

Since there are numerous of predictors are found to be insignificant, some additional fine-tuning is needed to accomplish at a cleaner model. This study uses backward elimination to remove insignificant predictor from Model four. Backward

elimination begins with all variables and proceeds to remove the variables one by one until an optimal model is reached. This is the opposite of forward elimination which begins with zero variables and then adds them one by one.

Table 6: Result of Backward Elimination Model

	Bankruptcy Model 4	Bankruptcy Model 5	Bankruptcy Model 6	Bankruptcy Model 7	Bankruptcy Model 8
BoardSize	-0,257	-0,254	-0,341	-0,352	-0,319
	0,088*	0,091*	0,017**	0,013**	0,021**
FemDir	4,658	4,574	4,827	4,649	-
	0,200	0,205	0,118	0,136	-
IndDir	-2,387	-2,268	-1,455	-	-
	0,306	0,322	0,501	-	-
Liquidity	-1,142	-1,114	-1,405	-1,405	-1,356
	0,000***	0,000***	0,000***	0,000***	0,000***
Leverage	6,769	6,968	5,868	5,857	5,546
	0,000***	0,000***	0,000***	0,000***	0,000***
RI-RN	-1,304	-1,282	-0,979	-0,980	-0,977
	0,007***	0,007***	0,002***	0,002***	0,002***
Rsize	1,762	1,545	-	-	-
	0,306	0,352	-	-	-
Productivity	-0,044	-20,998	-23,948	-23,950	-22,377
	0,724	0,000***	0,000***	0,000***	0,000***
MB	-20,725	-	-	-	-
	0,000***	-	-	-	-
Constant	1,022	0,696	2,766	1,741	1,937
	0,711	0,787	0,212	0,271	0,212

Model 4 are restated in this table as a reference
All variables are defined in Appendix 1.
*, **, *** denotestatistical significance at the 0.10, 0.05, and 0.01 level, respectively.

Model five through eight show the process of the backward elimination, with Model 8 as the final outcome. Model five eliminate one variable from the model four. The excluded variable is MB or Market to Book ratio. The sixth model exclude Rsize variables while on the seventh model, IndDir is erased. Model 8 shows the best fit.

Among the governance variables, the variable BoardSize remain statistically significant while the other governance variables are eliminated. BoardSize is statistically significant (-0,319) at the level of 5%. The significantly positive beta for BoardSize in model eight support the view that boards with more members has better chance to survive bankruptcy risk. The financial and market-based control variables for model eight are again, statistically significant with the same direction as the model four.

Chapter 6: Concluding Remarks

6.1 Conclusion

This purpose of this study is to provide evidence that board director's characteristics have impact on the probability of corporate bankruptcy. Board size, proportion of female directors and proportion of independent directors are used as the board of director characteristic indicators. The study also includes the classical financial ratios e.g. leverage, liquidity and productivity (Altman, 1968), and market-value driven variables, such as annual excess return, relative size of firm and market-to-book ratio as control variables (Shumway, 2001. Altman, 1968). The difference with the earlier literature is the fact that this study only collects those company that have filed for bankruptcy under chapter 11. Dummy variables are used to capture the chapter 11 bankruptcy: 1 if the company is filing the chapter 11 bankruptcy, and 0 otherwise. The study covers the period 2000-2014, by analyzing 95 companies that went bankrupt and 95 viable companies, with total of 190 companies.

The following logit regression model examined the research question. The model fits the data and is significant, where one of three variables are significant. The control variable liquidity, leverage, annual excess return, productivity and market-to-book ratio are found statistically significant. The other control variables are insignificant, therefore are not associated with the probability of bankruptcy.

The results show that overall, board director's characteristics have some influence on the probability of bankruptcy, board size is likely to be associated with probability of bankruptcy in the company, while proportion of female director and proportion of independent director is not. Hence, the result rejects the hypotheses 1, and accept the hypotheses 2 and 3. The significant correlation of board size is in line with study from Fich and Slezak (2008), which indicated smaller board are more effective at avoiding bankruptcy once the company becomes distressed. These results prove that the board director serve as internal control mechanism in the corporate governance, and that governance structures do partially contribute to the probability of bankruptcy.

6.2 Limitations and Suggestion for further Research

The biggest limitation of this study was the lack of available data from the Institutional Shareholder Services (ISS) for board characteristic information. Due to the lack available data, a more complex approach was taken to identify the board characteristic information used in the sample of this study. The SEC filing namely EDGAR database was used to manually collect the data. However, some amount of data points could not be retrieved, due to incomplete information in the EDGAR database. As a result of this complication, the sample of this study is relatively small. A smaller sample size makes it harder to generalize the result of this study. Considering this limitation, further researcher could avoid the small sample size by selecting much longer timespan, thereby possibly increase the validity and improve the result.

In addition of the limitation is the matching procedures of the bankrupt samples with the healthy samples. The matching process in this study has been done manually and includes reasonable measures, such as similar size of company and similar year. Nevertheless, the use of a matching algorithm could improve the process further by including more variables and increasing the accuracy.

References

Adams, R. B., and D. Ferreira, (2009). Women in the Boardroom and their Impact on Governance and Performance. *Journal of Financial Economics 94*(2): 291-309.

Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance 23*(4): 589-609.

Altman, E. I. (1986). Bankruptcy and Reorganization. *Handbook of Corporate Finance (John Wiley & Sons, New York)*

Altman, E. I., Haldeman, R. G., & Narayanan, P. (1977). ZETATM analysis A new model to identify bankruptcy risk of corporations. *Journal of Banking & Finance*, *1*(1), 29-54.

Baker, M., and P. A. Gompers. (2003). The Determinants of Board Structure at the Initial Public Offering*. *Journal of Law and Economics*,*46*(2): 569-598.

Bart, C., & McQueen, G. (2013). Why women make better directors. *International Journal of Business Governance and Ethics*, *8*(1), 93.

Baysinger, B. D., and H. N. Butler. (1985). Corporate Governance and the Board of Directors: Performance Effects of Changes in Board Composition. *Journal of Law, Economics, & Organization*, *1*(1): 101-124.

Baysinger, B., and Hoskisson, R. E. (1990). The Composition of Boards of Directors and Strategic Control: Effects on Corporate Strategy. *Academy of Management review*, *15*(1): 72-87.

Beasley, M. S. (1996). An Empirical Analysis of the Relation between the Board of Director Composition and Financial Statement Fraud. *Accounting Review*: 443-465.

Beaver, W. H. (1966). Financial Ratios as Predictors of Failure. *Journal of Accounting Research*, 71-111.

Betker, B. L. (1995). Management's Incentives, Equity's Bargaining Power, and Deviations from Absolute Priority in Chapter 11 Bankruptcies. *Journal of Business 68:* 161–183.

Bøhren, Ø., and R. Ø. Strøm, (2007, February). Aligned, Informed, and Decisive: Characteristics of Value-Creating Boards. In *EFA 2007 Ljubljana Meetings Paper*.

Brockmann, E. N., J. J. Hoffman, D. D. Dawley, and C. J. Fornaciari. (2004). The Impact of CEO Duality and Prestige on a Bankrupt Organization. *Journal of Managerial Issues 16:* 178–196.

Bryan, D., G. D. Fernando, and A. Tripathy, (2013). Bankruptcy Risk, Productivity and Firm Strategy. *Review of Accounting and Finance*,*12*(4): 309-326.

Byrd, J. W., and K. A. Hickman, (1992). Do Outside Directors Monitor Managers?: Evidence from Tender Offer Bids. *Journal of financial economics*,*32*(2): 195-221.

Campbell, K., and A. M. Vera. (2010). Female Board Appointments and Firm Valuation: Short and Long-Term Effects. *Journal of Management & Governance*, *14*(1): 37-59.

Carter, D. A., B. J. Simkins, and W. G. Simpson, (2003). Corporate Governance, Board Diversity, and Firm Value. *Financial review*, *38*(1): 33-53.

Chaganti, R. S., V. Mahajan, and S. Sharma. (1985). Corporate Board Size, Composition and Corporate Failures in Retailing Industry [1]. *Journal of Management Studies*, *22*(4): 400-417.

Chan, C.Y., D. W. Chou, J. R. Lin, and F. Y. Liu. (2016). The Role of Corporate Governance in Forecasting Bankruptcy: Pre- and Post- SOX Enactment. *North American Journal of Economics and Finance 35:* 166–188

Chapter 11 - Bankruptcy Basics. (n.d.). Retrieved from http://www.uscourts.gov/services-forms/bankruptcy/bankruptcy-basics/chapter-11-bankruptcy-basics.Last accessed 05 March 2018

Clarke, C. J. (2005). The XX Factor in the Boardroom: Why Women Make Better Directors. *Directors Monthly 24*: 8-10

Clarke, D. C. (2006). Setting the Record Straight: Three Concepts of the Independent Director. *SSRN Electronic Journal*.

Conyon, M. J., and Peck, S. I. (1998). Board Control, Remuneration Committees, and Top Management Compensation. *Academy of Management Journal*, *41*(2): 146-157.

Cox, D. R. (1972). Regression Models and Life Tables. *Journal of the Royal Statistical Society Series 34:* 187–220.

Burt, R.S. (1983), Corporate Profits and Cooptation, Academic Press, New York, NY.

Daily, C. M., and D. R. Dalton. (1994). Corporate Governance and the Bankrupt Firm: An Empirical Assessment. *Strategic Management Journal*,*15*(8): 643-654.

Daily, C. M., and D. R. Dalton, (1994b). Bankruptcy and Corporate Governance: The Impact of Board Composition and Structure. *Academy of Management journal*, *37*(6): 1603-1617.

Dalton, D. R., C. M. Daily, A. E. Ellstrand, and J. L. Johnson. (1998). Meta-Analytic Reviews of Board Composition, Leadership Structure, and Financial Performance. *Strategic Management Journal 19*(3): 269-290.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney, (1996). Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC. *Contemporary accounting research*, *13*(1): 1-36.

Du Rietz, A., and M. Henrekson, (2000). Testing the Female Underperformance Hypothesis. *Small Business Economics*, *14*(1): 1-10.

Darrat, A. F., S. Gray, J. C.Park, and Y. Wu. (2014). Corporate Governance and Bankruptcy Risk. *Journal of Accounting, Auditing & Finance 31(1):* 163-202

Earley, C. P., and E. Mosakowski, (2000). Creating Hybrid Team Cultures: An Empirical Test of Transnational Team Functioning. *Academy of Management Journal*, *43*(1): 26-49.

Eisenberg, T., S. Sundgren, and M. T. Wells, (1998). Larger Board Size and Decreasing Firm Value in Small Firms. *Journal of financial economics*, *48*(1): 35-54.

Elloumi, F., and J. P. Gueyie, (2001). Financial Distress and Corporate Governance: an Empirical Analysis. *Corporate Governance: The international journal of business in society 1*(1): 15-23.

Erhardt, N. L., J. D. Werbel, and C. B. Shrader, (2003). Board of Director Diversity and Firm Financial Performance. *Corporate governance: An international review*, *11*(2): 102-111.

Fama, E. F., & French, K. R. (1995). Size and Book-to-Market Factors in Earnings and Returns. *The Journal of Finance*, *50*(1), 131

Fich, E. M., and A. Shivdasani. (2006). Are Busy Boards Effective Monitors?. *The Journal of finance*, *61*(2): 689-724.

Fich, E. M., and S. L. Slezak, (2008). Can Corporate Governance Save Distressed Firms from Bankruptcy? An Empirical Analysis. *Review of Quantitative Finance and Accounting 30(2):* 225-251.

Gales, L. M., and I. F. Kesner (1994). An Analysis of Board of Director Size and Composition in Bankrupt Organizations. *Journal of business research*, *30*(3): 271-282.

Gilson, S. C. (1990). Bankruptcy, boards, banks, and blockholders. *Journal of Financial Economics*, *27*(2), 355-387.

Gilson, S. C., and M. R. Vetsuypens, (1993). CEO Compensation in Financially Distressed Firms: An Empirical Analysis. *The Journal of Finance 48(2):* 425-458.

Goodstein, J., K. Gautam, and W. Boeker, (1994). The Effects of Board Size and Diversity on Strategic Change. *Strategic management journal*,*15*(3): 241-250.

Graham, J. R., H. Li S. Kim, and J. Qiu, (2013). Human Capital Loss in Corporate Bankruptcy. *US Census Bureau Center for Economic Studies Paper No. CES-WP-13-37*.

Hambrick, D. C., and R. A. D'Aveni. (1988). Large Corporate Failures as Downward Spirals. *Administrative Science Quarterly*, 1-23.

Hillman, A. J., and T. Dalziel. (2003). Boards of Directors and Firm Performance: Integrating Agency and Resource Dependence Perspectives. *Academy of Management review*, *28*(3): 383-396.

Huse, M., and A. Grethe Solberg, (2006). Gender-Related Boardroom Dynamics: How Scandinavian Women Make and can Make Contributions on Corporate Boards. *Women in Management Review 21*(2): 113-130.

Jehn, K. A., and K. Bezrukova, (2004). A Field Study of Group Diversity, Workgroup Context, and Performance. *Journal of Organizational Behavior*,*25*(6): 703-729.

Johnson, J. L., C. M. Daily, and A. E. Ellstrand. (1996). Boards of Directors: A Review and Research Agenda. *Journal of management*, *22*(3): 409-438.

Judge, W. Q., and C. P. Zeithaml. (1992). Institutional and Strategic Choice Perspectives on Board Involvement in the Strategic Decision Process. *Academy of management Journal*, *35*(4): 766-794.

Kidwell, R. E., and N. Bennett, (1993). Employee Propensity to Withhold Effort: A Conceptual Model to Intersect Three Avenues of Research. *Academy of management review*, *18*(3): 429-456.

Kumar, P., & Sivaramakrishnan, K. (2008). Who Monitors the Monitor? The Effect of Board Independence on Executive Compensation and Firm Value. *Review of Financial Studies*, *21*(3), 1371-1401.

Lane, D. M. (n.d.). Online Statistics Education: A Multimedia Course of Study. Retrieved February 24, 2018 from http://onlinestatbook.com/

Lau, D. C., and J. K. Murnighan, (1998). Demographic Diversity and Faultlines: The Compositional Dynamics of Organizational Groups. *Academy of Management Review*, *23*(2): 325-340.

Libby, R. (1981). Accounting and Human Information Processing: Theory and Applications. Englewood Cliffs: Prentice-Hall.

Libby, R., R. Bloomfield, and M. W. Nelson. (2002). Experimental Research in Financial Accounting. *Accounting, Organization and Society 27(8)*: 775-810.

Lorsch, J., and MacIver, E. (1989). Pawns and Potentates. *Boston: Harvard Business School*.

Louden, J. K., and J. Zusman. (1982). *The director: A Professional's Guide to Effective Board Work*. American Management Associations.

Lynn M. LoPucki. (n.d.) UCLA-LoPucki Bankruptcy Research Database (BRD) | A window on the world of big-case bankruptcy. Retrieved Febuary 15, 2018 from http://lopucki.law.ucla.edu/

Maassen, G. F. (1999). *An International Comparison of Corporate Governance Models* (Vol. 31). Gregory Maassen.

Maddala, G. S. (1991). A Perspective on the Use of Limited-Dependent and Qualitative Variables Models in Accounting Research. *The Accounting Review 66*(4): 788-807.

McConnell, J. J., and H. Servaes, (1990). Additional Evidence on Equity Ownership and Corporate Value.*Journal of Financial economics*, *27*(2): 595-612.

McInerney-Lacombe, N., D. Bilimoria, and P. F. Salipante, (2008). Championing the Discussion of Tough Issues: How Women Corporate Directors Contribute to Board Deliberations. *Women on Corporate Boards of Directors: International Research and Practice*: 123-139.

Mintzberg, H. (1983). The Case for Corporate Social Responsibility. *Journal of Business Strategy*,*4*(2): 3-15.

Mizruchi, M. S. (1983). Who Controls whom? An Examination of the Relation between Management and Boards of Directors in Large American Corporations. *Academy of management Review*,*8*(3): 426-435.

Muth, M., and L. Donaldson, (1998). Stewardship Theory and Board Structure: A Contingency Approach. *Corporate Governance: An International Review*, *6*(1): 5-28.

Morck, R., A. Shleifer, and R. W. Vishny, (1988). Management Ownership and Market Valuation: an Empirical Analysis. *Journal of financial economics*,*20*, 293-315.

Nahar Abdullah, S. (2006). Board structure and ownership in Malaysia: the case of distressed listed companies. *Corporate Governance: The international journal of business in society*, *6*(5), 582-594.

Nguyen, B. D., and K. M. Nielsen, (2010). The Value of Independent Directors: Evidence from Sudden Deaths. *Journal of Financial Economics*, *98*(3): 550-567.

Ohlson, J. A. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 109-131.

Perry, J.P. (1995). The Cadbury Committee and corporate governance in UK. *The CPA Journal*, May, pp. 24-8.

Pfeffer, J., & Salancik, G. R. (1978). The External Control of Organisations. *New York*, *175*.

Pitcher, P., S. Chreim, and V. Kisfalvi. (2000). CEO Succession Research: Methodological Bridges over Troubled Waters. *Strategic Management Journal*: 625-648.

Platt, H., & Platt, M. (2012). Corporate board attributes and bankruptcy. *Journal of Business Research*, *65*(8), 1139-1143.

Robinson, G., and K. Dechant, (1997). Building a Business Case for Diversity. *The Academy of Management Executive*, *11*(3): 21-31.

Rose, C. (2007). Does Female Board Representation Influence Firm Performance? The Danish Evidence. *Corporate Governance: An International Review*,*15*(2), 404-413.

Santomero, A. M., and J. D. Vinso. (1977). Estimating the Probability of Failure for Commercial Banks and the Banking System. *Journal of Banking & Finance 1*(2): 185-205.

Sharma, V. D. (2004). Board of Director Characteristics, Institutional Ownership, and Ffraud: Evidence from Australia. *Auditing: A Journal of Practice & Theory 23*(2): 105-117.

Shrader, C. B., V. B. Blackburn, and P. Iles, (1997). Women in Management and Firm Financial Performance: An Exploratory Study. *Journal of managerial issues*, 355-372.

Shumway, T. (2001). Forecasting Bankruptcy More Accurately: A Simple Hazard Model*. *The Journal of Business74*(1):101-124.

Simpson, W. G., and A. E Gleason,. (1999). Board Structure, Ownership, and Financial Distress in Banking Firms. *International Review of Economics & Finance*, *8*(3): 281-292.

Stephenson, C. (2004). Leveraging Diversity to Maximum Advantage: The Business Case for Appointing more Women to Boards. *Ivey Business Journal 69*(1): 1-5.

Walsh, J. P., and J. K. Seward. (1990). On the Efficiency of Internal and External Corporate Control Mechanisms. *Academy of management review*,*15*(3): 421-458.

White M,J.. (1989). The Corporate Bankruptcy decision. *The Journal of Economic Perspectives*. 3 (2), 129-151.

Williams, K. Y., and, C. A. HI. O'Heiliy, (1998). Demography and Diversity in Organizations: A Review of 40 years of Research. *Research in Organizational Behavior*, *20*, 7.

Wu, Y., C. Gaunt, and S. Gray. (2010). A Comparison of Alternative Bankruptcy Prediction Models. *Journal of Contemporary Accounting & Economics*, *6*(1): 34-45.

Yermack, D. (1996). Higher Market Valuation of Companies with a Small Board of Directors. *Journal of Financial Economics 40*(2): 185-211.

Zahra, S. A., and J. A. Pearce, (1989). Boards of Drectors and Corporate Financial Performance: A Review and Integrative Model. *Journal of management*, *15*(2): 291-334.

Appendix 1: Variable Definition Table

Appendix I. Variable Definition

Dependent Variable	**Definition**
Bankruptcy	Dummy variable: 1 for company that files for Chapter 11 bankruptcy, 0 otherwise
Independent Variables	**Definition**
BoardSize	Number of Board Director
IndDir	Percentage of Independent Director in the Board Director
FemDir	Percentage of Female Director on Board
Control Variables	**Definition**
Liquidity	Cash and Current Asset : Current Liabilities
Leverage	Total Liabilities : Total Asset
Productivity	EBIT : Total Asset
RIRN	Return for the Companies - Value Weighted NYSE/AMEX Index Returns
RSize	Firm's Size : Total of the NYSE/AMEX Market Size
MB	Market Value Equity : Book Value Equity