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Earnings management, corporate governance, and auditor's opinions: a financial distress prediction model

Abstract

This study sets out to examine three issues: whether financially distressed firms are more likely to manipulate their earnings, whether the board of directors of these firms has a low level of independence, and whether the opinion of their auditors reflects the possibility of financial distress. This study uses a dataset of listed and de-listed firms from 1997 to 2007 to examine various factors and conditions before a firm's financial distress, including the variables of earnings management, corporate governance, and audit opinions. This study is unique in its combination of these three variables to build a financial distress prediction model, which is used to verify whether financial distress has occurred in a firm recently. The prediction model may help countries or firms to predict and prevent the likelihood of a financial distress.

Keywords: financial distress, financially distressed firms, earnings management, corporate governance, auditor's opinion.

JEL Classification: G34.

Introduction

Due to the current adverse conditions in the entire international financial community and the effect of the US subprime mortgage crisis, many corporations have committed abuses one after the other. For instance, in Taiwan the Rebar and Procomp scandals associated with Wang You-Zeng were caused by business management problems, insider trading that hollowed out the firm's assets, as well as accountants' irresponsibility. The subprime mortgage crisis is perhaps one of the causes of unsound corporate governance and this article aims to investigate further the primary reason that leads to such practices.

September 15, 2008 became an unforgettable day in the world's financial history when Lehman Brothers Holdings Inc., the fourth largest investment bank in the U.S., went out of business and applied for bankruptcy protection. This was followed by Bank of America's acquisition of Merrill Lynch. The impact of these events was strongly felt in the stock market of every nation. Every market crashed like a set of dominoes, resulting in a global financial storm that lasted for more than one year and a half. The healing and restoration of the global financial system is expected to be costly and would take a long time. Furthermore, this proves the fact that financial markets worldwide are closely linked and the fates of the global members are strongly interconnected.

As far as business managers are concerned, the breadth and depth of the US crisis effects have been exceptionally huge. Corporate funding was inevitably affected. Due to lack of confidence, bank credits became more conservative so that corporate financing became more difficult to improve. Adding to this there is the financial turmoil that dampened the

stock market and tightened business cash flows. As soon as the banks tightened the money supply, firms in relatively tight financial situation were considered to be in financial distress.

With regard to Taiwan's financial industry, the scale of its exposure to Lehman Brothers shares, bonds, and derivatives amounted to NT\$400B based on the statistics provided by the Executive Yuan's Financial Supervisory Commission. This figure is smaller than a single bank's non-performing loans due to the financial storm. This means that Taiwan was not severely affected mainly because of the low level of internationalization of its financial industry. However, although the country was not directly and harshly hit, the effects of the crisis do exist and are especially apparent in gold trading, higher risks in consumer loans, and freezing of nascent wealth management businesses. At the same time, this wave of global financial tsunami accelerated the economic degradation leading to adverse effects upon market demands. This is a serious challenge that the financial industry must face.

According to the corporate governance framework stated by the OECD, an integrated framework must include internal and external management systems. Corporate governance has been a popular topic in the past few years, often discussed by our local business, academic, and political circles. In January 2006, Taiwan amended the Securities Exchange Act to address corporate governance issues. The concept of corporate governance has spread vigorously because of its universality. Its principal goal is to find an effective solution especially in nations where financial crisis outbreaks have prevailed in the past few years. Major international organizations such as the OECD, World Bank, APEC, and IOSCO strongly promote the importance of corporate governance.

This article is based on the current status of corporate governance in Taiwan. By collecting and compiling past studies and case discussions on corporate governance and Board of Directors, it aims to determine the full dimensions of corporate governance and to provide a self-assessment tool for corporate governance as well as the best model to prevent the occurrence of financial distress in the firms. In other words, this study examines the corporate governance issues from a firm-level perspective.

Recently, numerous financial disasters leading to corporate bankruptcies have taken place both in local and foreign markets due to poor corporate governance systems. Thus, governments from around the world began to stress the importance of corporate governance. This study shall attempt to analyze the complete corporate governance structure for the purpose of providing various opinions and methods that will help companies prevent financial distress. This study also aims to address the following issues:

1. Based on a review of financial reports, this study shall examine whether a company manipulated its book surplus prior to a financial distress outbreak, and determine whether the manipulation is more severe than that by a distress-free company.
2. Based on the firm's internal governance, this study shall examine whether the Board of Directors of a financially distressed company had a low level of independence prior to a financial distress outbreak, which indicates that its insufficient governance systems are more serious than that of a distress-free company.
3. Based on a firm's external supervision, this study shall classify the auditor's opinion on the financially distressed company prior to the financial distress outbreak as qualified opinion, modified unqualified opinion, or disclaimer of opinion and show whether the auditor's report reflected the possibility of a financial distress.
4. Finally, this study shall identify the causes of financial distress and test the accuracy of forecast.

This study uses a dataset of listed and de-listed firms from 1997 to 2007 to examine the factors and conditions before a firm's financial distress, including the variables of earnings management, corporate governance, and auditor's opinions. This study is unique in its combination of these three variables to build a financial distress prediction model, which is used to verify whether a financial distress has occurred in a firm in recent years. The prediction model may help countries or firms to predict and prevent the likelihood of a financial distress.

1. Review of literature

1.1. Effect of earnings manipulation on a financially distressed company. *1.1.1. Definition of financial distress.* In summarizing local and international empirical studies related to corporate financial distress, it is found that no unified standard exists with regard to the definition and causes of financial distress given by scholars. However, we consider the definition given by Beaver (1966) – firms with huge bank overdrafts, corporate bonds in default, non-payment of preferred stock dividends, and those that declare bankruptcy comprise financially distressed companies.

1.1.2. Earnings management prior to the financial distress outbreak. Taiwan researches show that two years prior to a financial distress outbreak, a huge discrepancy exists between financially distressed companies and distress-free firms on how they manipulate their book surplus, implying that management authorities of financially distressed firms may have substantially manipulated their book surplus.

Beneish (1999) discovers that in reviewing financial reports, the management authorities of firms that have deliberately and substantially manipulated the book surplus sell their shares in advance. But as soon as their actions are exposed, the stock prices of these firms drop significantly. As a result, shareholders who invested in these companies immediately suffer huge losses. The conclusion of this study reveals that there are two scenarios which will prove that management may have possibly jacked up the firm's book surplus, and these are: (1) the firm is suspected of deliberately raising the book surplus prior to its financial distress outbreak; and (2) the supervisory and management level were engaged in unusual activities in the stock exchange.

1.1.3. A model on how company performance affects financially distressed companies. The research done by Tam and Kiang (1992) on banks in Texas from 1985 to 1987 is used as a reference to understand better how company performance affects financially distressed firms. Their study gathered 59 banks that had undergone financial distress and used them as "failure" observations. Paired observations were taken. Several analytical tools like linear discriminant analysis (LDA), artificial neural network, K Nearest, Logit, and Decision Tree were used to establish the forecasting model and to compare the empirical results. Their findings show that one year before the financial distress outbreak, the artificial neural network has a better and more accurate discrimination rate of 85.2%. Two years prior to the financial distress outbreak, the forecasting model established using Logit analysis proved to be better

with 92.5% accuracy. However, the probability of classification errors with the Jackknife method served as unbiased estimates. The artificial neural network model produced better results than the Logit analysis model with accuracy rates of 89.5% and 89.2%, respectively.

By using financial structure variables, corporate governance variables, default rate measurement variables, and economic variables, this study explores the different causes of financial distress and predicts the probability of a corporate financial distress.

1.2. Effect of corporate governance on financially distressed companies. *1.2.1. Ratio of inside and outside directors and corporate performance.* Buchholtz and Ribbens (1994) define outside directors as those who do not belong to the internal representatives and are not directly employed as “non-management directors” of the company. From the standpoint of corporate governance, Cadbury (1993) states that outside directors normally have higher professional independence and are more capable of attaining supervisory functions. This reduces possible collusion and misuse of company assets by higher management and improves corporate performance.

With regard to inside directors, Rechner (1989) defines inside director as a director who actually participates in the firm’s operations and does administrative work.

1.2.2. Effect of corporate governance. (I) Inside shareholders and governance mechanisms.

1. Stock ownership of managers and corporate performance show a positive correlation.

Convergence-of-interest hypothesis. Jensen and Meckling (1976) both underline the convergence-of-interest hypothesis. Their view is that when managers hold more shares, more benefits become closely related to the shareholders. Moreover, it reduces the misuse of company assets. Because of their personal interests, each of them carries more responsibilities as they hold more shares. This somehow indicates that management is less likely to execute policies that will prove unfavorable to the shares and therefore, improve corporate performance as a result.

2. Number of managers with stock ownership and corporate performance show a negative correlation.

Entrenchment hypothesis. Jensen and Ruback (1983) express that increasing the stock ownership ratio of managers will grant enough voting power

that will tempt their personal interests and damage the value of the company. Similarly, Shleifer and Vishny (1997) state that when management authorities seize the corporate funds by force, their actions will not be limited to misappropriation of funds, but also include means that will benefit themselves while bringing down the firm’s value.

(II) Outside shareholders and governance mechanisms.

1. Percentage of institutional investors.

Shleifer and Vishny (1986) consider major shareholders as a form of oversight mechanism and may even monitor effectively the behavior of management. In the process, they strive to upgrade the efficiency of operations and thus, enhance the overall value of the company.

2. Institutional investors monitoring incentive hypothesis.

From the point of view of institutional investors, Pound (1988) developed several hypotheses based on monitoring incentive.

Efficient monitoring hypothesis. According to Oviatt (1988), institutional investors possess more specialized skills and knowledge that make it easier to access information; thus, they would have relatively lower monitoring costs compared to other investors. In this case, institutional investors would be able to monitor the firm more effectively than the smaller investors and consequently raise the overall value of the firm. Since institutional investors have more equity and specialized knowledge, they are in the position to ascertain the soundness of policies implemented by managers. Their monitoring costs prove lower than those of general investors. Therefore, the effective monitoring by institutional investors has a direct proportional relationship with corporate performance.

Conflict-of-interest hypothesis. This hypothesis suggests that institutional investors may also be plagued with agency problems. They themselves may have conducted other business dealings with the company and support management’s plan because of vested interests (even if the plan may produce adverse effects on the shareholders) or support their entry into the Board of Directors. These may violate the rights and interests of the shareholders and also limit the effects of monitoring the investment company managers.

(III) Concentration of equity shares and corporate governance.

Large-scale enterprises were considered to be dispersed ownership before the ‘70s. However, the

research done by La Porta et al. (1988) on the concentration of equity shares in 49 countries show that ownership structure is quite centralized in a global scope. Furthermore, Claessens et al. (2000) analyzed the market entry of firms in nine East Asian countries. Results of the study show that a 20% stake is the ultimate control for the differentiating standard in Taiwan. The study also shows that 73.8% of the firms have ultimate control which indicates that the stocks in the country are highly concentrated, while 48.2% of the controlled stocks rest in the hands of family clans.

When the concentration of equity shares is controlled by management or when they depend on operations, the management is said to have higher stakes. Thus, increasing the proportion of shares will facilitate their full access to decision-making and shield them from outside shareholders.

1.3. Auditor and the financially distressed company.

1.3.1. Auditor's opinion. The auditor's opinion is the ultimate result of the accountant's investigative work. Whether the auditor reports the deficiencies of the client depends on some considerations such as the fact that improper opinions may affect the costs (Raghunandan and Rama, 1995). Therefore, the quality of audit opinions must be assessed.

1.3.2. Effect of auditor's independence. In the past, auditor opinions were used to measure the independence of auditors in a firm. The general focus was on the auditor's possible misgivings about the continuing operations of the financially distressed firm since this could mean that the firm may suddenly face issues about the continuity of its operations. However, Hopwood et al. (1989) noted that based on previous researches, more than 50% of the firms do not receive negative auditor opinions regarding their continuing operations before experiencing bankruptcy. Perhaps it is because the auditor is incapable of identifying problems on continuing operations or the auditor's independence is not quite effective.

DeFond et al. (2002) state that the misgivings of auditors on a firm's continuing operations is a way of deliberating the company's financial situation and as a response to the client's request not to hold back on their opinions. Therefore, if auditors are given more independence, it would be more likely for financially distressed companies to receive the auditor's misgivings on their continuing operations. Lee et al. (2003) used the auditor's misgivings on continuing operations as the acting variable for auditor independence. Their study shows that the concentration of shares held by the Board of Directors affects the auditor's independence.

2. Research methods

2.1. Research hypothesis. Based on the study of Beneish (1999), the financial statement is a good indication whether a deliberate posting of a surplus entry was done by a firm about to experience a financial distress. The behavior of the management level especially in their participation in the stock exchange likewise indicates whether a firm's management level is responsible for deliberately posting a surplus entry or is engaged in unusual behavior. Generally speaking, firms that are about to go bankrupt often manipulate their profits. Some even resort to embezzlement or other stealthy activities so as to cover up the firm's financial situation. Odd circumstances may be detected through the following entries: accounts receivable, inventory, buildings, machinery and equipment, sales, accruals from networking capital, and cash flow. They also reveal whether the firm in financial distress manipulated its profits in order to delay imminent explosion of the distress. For that reason, this article ascertains that the probability of financially distressed firms manipulating their book surplus prior to a distress outbreak is likely to increase, with results that could be far more serious than those of their distress-free counterparts. Thus, the first hypothesis is formed:

Hypothesis 1: The rate by which financially distressed firms would manipulate book surplus prior to a distress outbreak is increasingly high, and the gravity of which is far more serious than that with distress-free firms.

Kesner (1987) states that board directors may not give an objective assessment on the performance of higher managers when they are family relatives. In addition, their direct or indirect vested interests in the firm also affect the independence of the Board. In cases when the Chairman of the Board concurrently serves as Managing Director, Fuerst and Kang (2000) emphasize that this adoption of concurrent posts causes a positive correlation with a financial distress occurrence. In other words, when the Chairman of the Board is also the Managing Director, this will definitely interfere with how board meetings are conducted and undermine the Board's independence. Ultimately, the situation may affect the firm's supervisory management functions. Patton and Baker (1987) think otherwise. For them, the operating performance proves much better in firms where the Board has a high ratio of family members. Also, a low level of independence can actually raise the firm's performance and management governance. From the above argument, the second hypothesis is, therefore, established.

Hypothesis 2: The independence of the Board in a financially distressed firm is weaker prior to the distress outbreak which indicates that the lack of governance system in a financially distressed firm is more serious than its distress-free counterpart.

As a reaction to the Enron incident, the Sarbanes-Oxley Act of 2002 was passed. This particular law underlines the issue of auditor's independence and clearly states that auditors of public firms must be appointed by the Reviewing Board. The Reviewing Board is a committee responsible for appointing certified accountants, determining auditor's fees, and resolving differing opinions arising from financial reports between management authorities and auditors. The audit opinion is the final outcome of an auditor's job. Whether the audit opinion reports the possible problems of the client firm depends on some considerations such as the fact that some additional costs may arise if improper opinions are issued (Raghunandan and Rama, 1995). The audit opinion is, thus, often used as the measure of audit quality. In the past, audit opinions were used to measure the independent role of accountants in firms. The general focus was given to the auditor's misgivings about continuing operations, and this may abruptly cause the financially distressed firm to confront issues on continuing operations. DeFond et al. (2002) claim that the auditor's misgivings on continuing operations is a result of examining the firm's financial situation and of the client's request to provide categorical opinions. Therefore, this study presumes that financial reports are more likely to reveal the actual operational problems of financially distressed firms when auditors are allowed more auditing independence particularly before the

financial distress erupts. These arguments bring about the third hypothesis.

Hypothesis 3: In view of a firm's financial worries, the auditing report is more likely to reveal operational problems when the auditor is granted a higher level of independence.

2.2. Measuring variables. 2.2.1. *Measuring earnings management.* Recent accounting literature (Butler et al., 2004; Kothari et al., 2005; Tucker and Zarowin, 2006) has changed the Jones model which is deemed to be an inappropriate tool for measuring earnings management because it fails to consider future operating performance factors like the ROA. This article cites discretionary accruals in addition to ROA factors as proposed by Kothari et al. (2005) and as represented by the following model:

$$TAC_{i,t} = \frac{ONI_{i,t} - CFO_{i,t}}{A_{i,t-1}}, \quad (1)$$

where $TAC_{i,t}$ = Total accruals of i firm on the t year, $ONI_{i,t}$ = Income from continuing operation of i firm on the t year, $CFO_{i,t}$ = Cash flow from operations of i firm on the t year, $A_{i,t-1}$ = Year-end capital of i firm on year $t-1$.

The two-year period before the financial distress outbreak is referred to as the "event period", and the four-year period prior to the event period is referred to as the "evaluation period" (please, refer to Figure 1). We suppose that no financial distress occurred during the event period and evaluation period, and no manipulation of earnings is said to have taken place during the evaluation period.

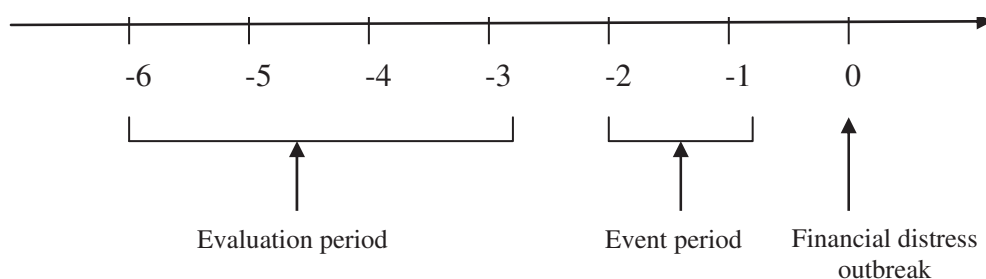


Fig. 1. A diagram of the manipulation period

Supposing the accounts receivables are discretionary accruals, then the accounts receivables during the evaluation period are dealt with control entries such as total assets, change in sales revenue minus change in accounts receivable, and total fixed assets. These are added to the return on

assets ($ROA_{i,t}$) to control the operating performance and evaluate non-discretionary accruals ($\hat{TAC}_{i,t}$ is regular accruals). The regression equation obtained from the evaluation period data is as follows:

$$\hat{TAC}_{i,t} = \alpha + \beta_0 \left(\frac{1}{A_{i,t-1}} \right) + \beta_1 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + \beta_2 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \beta_3 ROA_{i,t}, \quad (2)$$

where $\Delta REV_{i,t}$ = Change in sales revenue of i firm on year t and $t-1$, $\Delta REC_{i,t}$ = Change in accounts receivable of i firm on year t and $t-1$, $PPE_{i,t}$ = Plant, equipment, and other fixed assets of i firm on year t ,

$ROA_{i,t}$ = Return on assets of i firm on year t .

In equation (2), α , β_0 , β_1 , β_2 , and β_3 are regression coefficients. In this study, non-discretionary accruals are calculated by substituting the estimated coefficient into the model. The difference resulting from the subtraction of the estimated value of non-discretionary accruals from the yearly total accruals is the discretionary accrual ($DA_{i,t}$), such that

$$DA_{i,t} = TAC_{i,t} - \hat{TAC}_{i,t}. \quad (3)$$

At this point, the discretionary accruals during the event period and evaluation period are validated for any discrepancies with the authorized capital increase by using dummy variables. The regression model is as follows:

$$DA_{i,t} = \hat{\alpha}_i + \hat{\beta}_i PART_{i,t} + e_{i,t}, \quad t = -6, -5, \dots, -1, \quad (4)$$

$$\text{where } PART = \begin{cases} 1 & \text{Event period} \\ 0 & \text{Evaluation period} \end{cases}$$

The null hypothesis H_0 : $b_1 = 0$ means that the DA during the event period and the DA during the evaluation period do not have any systematic discrepancy. To reject H_0 indicates that a systematic discrepancy exists between the DA during the event period and the DA during the evaluation period, and suggests that the firm may have manipulated the book surplus two years prior to the financial distress outbreak. This determines if a verifiable hypothesis is established.

2.2.2. Examining the features of the Board of Directors. The ratio of the stock ownership of directors ($Bod\%$) represents the shareholding of directors, Managing Director, Chairman of the Board, etc. The pledged shares of directors ($Pled\%$) represent the number of pledged shares of the firm directors divided by the total stock ownership of directors. The ratio of independent directors ($N_ind\%$) represents the ratio of directors who have not served concurrent positions in the firm. The Chairman of the Board who concurrently acts as Managing Director ($Dual$) serves as the dummy variable. If concurrent positions exist, then the value is 1; otherwise, the value is 0. Examining the features of the firm's Board of Directors determines whether the second hypothesis is established.

2.2.3. Audit opinion. Considering the persistent financial distress of domestic and foreign firms in recent years, the question remains as to whether

accountants can maintain a detached and independent position, and whether accountants can convey proper opinions that will arouse public concern before the financial distress takes place. Audit opinions may be classified as: (1) standard unqualified opinion; (2) modified unqualified opinion; (3) qualified opinion; (4) adverse opinion; and (5) disclaimer of opinion. Several issues and applications from the Statement of Financial Accounting Standards (SFAS) are used in this study. However, the use of the new SFAS produces accounting principles which are inconsistent with qualified opinions or modified unqualified opinions, and has no relation with continuing operation issues. In this regard, if the firm merely adopts the new SFAS and receives qualified or modified unqualified opinions, then this would be classified as an unqualified opinion. On the other hand, if the firm receives a qualified or modified unqualified opinion with misgivings on continuing operations, then this would be regarded as an uncertainty about the firm's continuing operations. Hence, if a firm receives an unfavorable audit opinion, such as a modified unqualified opinion, qualified opinion, adverse opinion, and disclaimer of opinion with misgivings on continuing operations, the value of the opinion is 1; otherwise, the value is 0. The opinion of the CPA verifies the establishment of hypothesis 3.

2.3. Empirical model of the research. This article adopts the Logit statistical model used to solve unreasonable probability prediction values arising from linear problems and determines whether the assumed incident complies with the Logistic distribution. It does not require the data to conform to regular distribution. For instance, Ohlson (1980) uses Logistic regression analysis for financial distress projections. The binary output of y can either be 0 or 1, which are values that represent two different groups. 1 refers to a firm undergoing a financial distress, while 0 represents the firm that is not undergoing a financial distress.

$p(y = 1 | X) = X$ belongs to the probability of non-occurrence of financial distress = $F(Z) = \frac{e^Z}{1 + e^Z}$,

where Z denotes a linear equation, such as

$$Z = \beta_0 + \beta_1 \times X_1 + \beta_2 \times X_2 + \dots + \beta_n \times X_n. \quad (5)$$

The value of $F(Z)$ is from 0 to 1. When a positive correlation exists between the Z -value and financial distress probability p , the Logistic function is transformed. A p -value between 0 and 1 signifies that it falls within the financial distress probability rate. Logit transformation is the log obtained from dividing the probability value of X in Group 0 by the probability value of X in Group 1. The linear regression model formed is as follows:

$$g(X) = \log \left[\frac{p(y=1|X)}{1-p(y=1|X)} \right] = \beta_0 + \beta_1 \times X_1 + \beta_2 \times X_2 + \dots + \beta_n \times X_n. \quad (6)$$

The probability of default and the estimated coefficients for the sample firms are established using the binary Logit regression model. Based on the variable, the positive or negative sign of the estimated factor is determined to see if it conforms to the projections before deciding on the final model.

The objective of this article is to establish a forecasting model for financial distress through the use of earnings management indicators, corporate management variable, and CPA opinion variable. These three variables are used to construct the model.

$$FAIL_{i,t} = \beta_0 + \beta_1 DA_{i,t-1} + \beta_2 DA_{i,t-2} + \beta_3 DUAL_{i,t-1} + \beta_4 DUAL_{i,t-2} + \beta_5 BOD_{i,t-1} + \beta_6 BOD_{i,t-2} + \beta_7 PLED_{i,t-1} + \beta_8 PLED_{i,t-2} + \beta_9 N_IND_{i,t-1} + \beta_{10} N_IND_{i,t-2} + \beta_{11} Auditor_{i,t-1} + \beta_{12} Auditor_{i,t-2}, \quad (7)$$

where *FAIL* is a dummy variable for distressed firms (1 represents financially distressed firm, while 0 represents regular firm). Internal financial information variable includes a discretionary accrual entry (*DA_{i,t}*) that measures the manipulation performed by management authorities. Corporate governance variables include *DUAL* which refers to the Chairman of the Board acting concurrently as the Managing Director, *BOD* which refers to the stock ownership of directors, *PLED* which represents the ratio of pledged shares by the corporate directors, and *N_IND* which represents the percentage of independent directors. External oversight variables include *Auditor* which represents the dummy variable for auditor opinion (1 represents the certified modified unqualified opinion or qualified opinion, and the rest is 0).

2.4. Research sample and source of data. 2.4.1.

Scope of research. This article initially examines the period before a corporate financial distress occurs and how the firm tries to conceal the distress. The time period covered in this research is between 1999 and 2005. The observations to be included in the sample were based on the following criteria:

1. Considering the nature of the financial insurance industry, the financial data structure is different from the other industries. Added to this there are the related policies and accounting system that must be complied with as instructed by the Ministry of Finance. These form the basis for elimination of observations.
2. Firms which do not provide data covering the 6-year period prior to their respective corporate financial distress were eliminated.

2.4.2. *Data.* The observations in this research are listed firms from 1999 to 2005. The data sources are:

This study differentiates the one-year and two-year periods prior to the financial distress and substitutes these variables in the model. 50% of the probability rate represents the segmentation point. The projected probability for financial distress is 0.5 higher in financially distressed firms, but 0.5 lower in financially sound firms. These figures are used to distinguish the appropriate projected probability for financially distressed firms and financially sound firms. The model is as follows:

1. The financial information of the sample firms were taken from the financial data archives of Taiwan Economic Journal.
2. Corporate prospectus of the sample firms.

As regards previous studies related to financial distress prediction models, most financially distressed firms and regular firms use 1:1 paired observations. This article has added observations of financially sound firms to reduce choice-based sampling biases caused by over-sampling, to lessen and eliminate the effects arising from different industries, accounting periods, firm size, and other factors, and to reinforce the suitability of the model. There are 93 observations for financial distresses and corporate governance in this study, and 186 observations of financially sound firms. Financially distressed firms and regular firms have a ratio of 1:2.

Panel A of Table 1 shows that the most distressed firms are those from the construction industry and are traditional domestic-oriented firms that are not directly affected by changes in the international economy. However, the increasing globalization has caused the mutual exchange of capital, technology, and labor. Moreover, Taiwan has been very much affected by the global economy. Considering the overall factors, the global economy produced significant effects on the construction industry.

Panel B shows that most corporate financial distresses occurred from 2000 to 2001, and might result from the sluggish global development. The entire global economy was badly hit following the dot-com bubble burst and 9/11 terrorist attacks in the USA. In addition, the successive storm floods in Taiwan inflicted heavy losses on business firms. Taiwan was certainly affected by both domestic and international factors during this pe-

riod, which produced adverse effects on the foreign trade of manufacturers. Domestic spending and investment followed a conservative trend.

Local industries and the local economy were in the doldrums. As a result, financial disasters were taking place everywhere.

Table 1. Distribution of firms in distress

Panel A. Industry distribution of firms in distress									
Number	Food	Textiles	Electric machinery		Electric and cable	Biotechnology and medical car		Chemistry	
	2	8	3		1	5		2	
Number	Chemistry	Glass and ceramics	Automobile		Electronics	Building material and construction		Shipping and transportation	
	2	11	1		23	16		2	
Number	Trading and consumer goods	Plastics	Stocks in custody		Rubber	Others		Total	
	1	1	5		1	9		93	
Panel B. Yearly distribution of firms in distress									
Number	1999	2000	2001	2002	2003	2004		2005	Total
	15	17	19	6	7	10		19	93

3. Empirical results

3.1. Examining whether distressed firms manipulated their book surplus prior to financial distress outbreak. This article compares firms with financial distress from those regular firms. Considering the 3- to 6-year period prior to the event period, the Panel Data estimates the values of the coefficients α , β_0 , β_1 , β_2 , and β_3 for non-discretionary accruals as shown in Table 2. Afterwards, the coefficient values

are substituted in the regression equation (2) to estimate the non-discretionary accruals two years before the financial distress occurred. The value of discretionary accruals is obtained by subtracting the yearly accruals from non-discretionary accruals during the 6-year period prior to the financial distress outbreak. This facilitates the investigation of whether the distressed firm manipulated its book surplus prior to the financial distress outbreak.

Table 2. Estimated coefficient of the estimated discretionary accruals for distressed firms and regular firms

$$TAC_{i,t} = \alpha + \beta_0 \left(\frac{1}{A_{i,t-1}} \right) + \beta_1 \left(\frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + \beta_2 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \beta_3 ROA_{i,t}$$

	Distressed firms	Regular firms
α	0.0774*** (0.0215)	4.8187 (324.7548)
β_0	893.9268 (679.3500)	-0.6955*** (0.0255)
β_1	0.1036*** (0.0015)	0.6242*** (0.0283)
β_2	-0.0872*** (0.0309)	0.0371*** (0.0065)
β_3	0.0059*** (0.0020)	0.0335*** (0.0055)

Notes: Standard errors in (). * at 10%, ** at 5%, *** at 1% significance level.

Table 3 shows that two years prior to the financial distress outbreak, a clear discrepancy exists between the breadth of earnings manipulation demonstrated by financially distressed firm and that of its sound counterpart. This implies that management authorities of the distressed firm may have exercised substantial manipulation of the firm's earnings. Prior to facing bankruptcy, firms would often resort to earnings manipulation to the extent of carrying out fraudulent acts in order to conceal their critical financial situation and to make the public

believe that it remains a profitable firm. The main objective is to satisfy their obligations to the stakeholders or to conceal the truth from participating investors in the stock market. Some management authorities would also use discretionary accounts receivable and discretionary inventory to increase and enhance the firm's earnings, or enhance the book earnings through overvalued assets. All these are ways to cover up the financial turmoil at hand. Therefore, the result of this study is similar to that of Beneish (1999).

Table 3. Identifying systematic discrepancies in the discretionary accruals ($DA_{i,t}$) during the event period and evaluation period

	Distressed firms	Regular firms
A	0.0070 (0.0150)	-6.9973 (628.7539)
B	-0.0584*** (0.0200)	629.1752 (733.3960)

Notes: Standard errors in (). * at 10%, ** at 5%, *** at 1% significance level.

3.2. Evaluating the corporate governance and auditor independence prior to the financial distress outbreak. Panel A in Table 4 shows the firms that underwent financial distress before 2005. A year before the distress occurred, the Board Chairman serving concurrently as the Managing Director (*DUAL*), rate of pledged shares by directors (*PLED*), and unfavorable audit opinion (*Auditor*) were significantly greater in financially distressed firms. On the other hand, firms in financial turmoil indicate a lower ratio of stock ownership of directors (*BOD*) due to the fact that the board of directors is keeping more classified information from the staff and is no longer optimistic about the firm's prospects. This results in reducing their shares in order to minimize loss in the event that the distress erupts. This contradicts the statement of Leland and Pyle (1977) which asserts that any increase in the stock ration by the firm staff conveys a positive message and enhances the overall value of the firm. Conversely, the overall value of the firm may run the risk of being questioned should the directors reduce the stocks percentage and eventually suffer a disastrous decline. The number of independent directors in a regular firm (*N_IND*) is not as significant as in financially distressed firms. On the other hand, a higher rate of pledged shares by the directors may indicate looming financial pressures. The pledged shares may also be used to promote and build up the firm's stocks. Later on, the directors may be confronted with cash flow problems. Therefore, a higher rate of pledged shares means that the business operation is far from being promising. Moreover, an increasing lack of governance mechanisms also manifests in the diminishing independence of the directors. The reasons stated above may result

in problems related to the corporate governance system, the results of which confirm hypothesis 2: the independence of the Board in a financially distressed firm is weaker prior to the distress outbreak and shows that the lack of governance system in a financially distressed firm is more serious than that in distress-free firms. Similarly, Jensen and Meckling (1976) state that shares of directors hold a positive correlation with corporate performance. That is, when directors possess more shares and their interests are more consistent with the firm's objectives, each of them cannot afford to formulate policies that will harm either the stakeholders or the firms themselves. Furthermore, this argument corresponds to the opinion raised by Shleifer and Vishny (1997) which states that funds obtained by the directors for the sake of their own interests may not be limited to cash but may also include other forms detrimental to the firm. With regard to the auditor's opinion, the rate of certified qualified opinion is higher than that of regular firms. This implies that the firm is already experiencing financial distress which may likely affect the firm. This result verifies hypothesis 3: in view of the firm's financial misgivings, the audit report is more likely to reveal operational problems when the auditor is granted a higher level of independence. In other words, the more independent an auditor is, the easier it is for a financially distressed firm to receive the opinion regarding continuing operations and the harder it would be for the firm to pursue operations. This echoes the opinion of DeFond et al. (2002) which states that if the auditor can provide impartial and objective opinions, then the examination result is able to withstand the pressure of the client and is not compromised at all. Furthermore, the audit checklist is based on whether the firm's internal financial situation is capable of pursuing operations and aims to enlighten the users of the report. Panel B shows that the difference in the corporate governance of firms in distress and regular firms two years before the outbreak is similar to that of the year before the outbreak, except for the insignificant result with regard to the Board Chairman serving concurrently as Managing Director (*DUAL*).

Table 4. Corporate governance and auditor opinion prior to the financial distress outbreak

Firms in distress			Regular firms			
	Mean	Standard deviation	Mean	Standard deviation	t-value	P-value
Panel A. One year before the financial distress outbreak						
<i>DUAL</i>	0.4301	0.4978	0.3387	0.4745	-1.4919	0.0684*
<i>BOD</i>	22.9184	17.5646	34.2669	44.7315	2.3316	0.0102**
<i>PLED</i>	30.6344	33.4803	13.0616	22.6258	5.1643	0.0000***
<i>N_IND%</i>	0.0396	0.1123	0.0566	0.1236	1.1107	0.1338
<i>Auditor</i>	0.6237	0.4871	0.3333	0.4727	-4.7873	0.0000***

Table 4 (cont.). Corporate governance and auditor opinion prior to the financial distress outbreak

Firms in distress			Regular firms			
	Mean	Standard deviation	Mean	Standard deviation	t-value	P-value
Panel B. Two years before the financial outbreak						
<i>DUAL</i>	0.3441	0.0495	0.3495	0.0351	0.0886	0.5353
<i>BOD</i>	26.3789	2.1667	33.2861	2.3471	1.8819	0.0305**
<i>PLED</i>	34.2018	3.5793	12.8015	1.6447	-6.2361	0.0000***
<i>N_IND%</i>	0.0329	0.0114	0.0354	0.0077	0.1892	0.4250
<i>Auditor</i>	0.4839	0.0521	0.3065	0.0339	-2.9350	0.0018***

Notes: * at 10%, ** at 5%, *** at 1% significance level.

3.3. Establishing a financial distress prediction model. The logistic regression model is used in this article to establish a financial distress prediction model with the following variables: earnings management indicator, corporate governance variable, and auditor opinion variable.

First of all, Table 5 shows that the list of financially distressed firms and regular firms from 1999 to 2005 establishes the predictive factors which are used to predict financially distressed firms for the year 2006. In Model 2, the 1996-2006 data were used to build a distress prediction model to forecast financially distressed firms in 2007.

Table 5. Building a financial distress prediction model in the sample

	Model 1	Model 2
Cons	-2.1361*** (0.4037)	-2.0036*** (0.4071)
<i>DA_{t-1}</i>	-1.1070** (0.5432)	-0.9840* (0.6053)
<i>DA_{t-2}</i>	1.2578** (0.6172)	1.1180* (0.6053)
<i>DUAL_{t-1}</i>	1.1025** (0.5166)	1.4291*** (0.4870)
<i>DUAL_{t-2}</i>	-0.6169 (0.5288)	-0.9147* (0.4971)
<i>BOD_{t-1}</i>	0.0003 (0.0004)	0.0003 (0.0004)
<i>BOD_{t-2}</i>	-0.0015 (0.0067)	-0.0053 (0.0081)
<i>PLED_{t-1}</i>	0.0093 (0.0088)	-0.0895 (0.0951)
<i>PLED_{t-2}</i>	0.0183** (0.0089)	0.1130 (0.0952)
<i>N_IND%</i> _{0t-1}	-1.0165 (2.5814)	-0.0157 (2.0743)
<i>N_IND%</i> _{0t-2}	2.4235 (2.6949)	0.6933 (2.1676)
<i>Auditor_{t-1}</i>	0.8364** (0.3430)	1.0985*** (0.3195)
<i>Auditor_{t-2}</i>	0.4615 (0.3496)	0.2607 (0.3209)
<i>Pseudo R-squared</i>	0.1909	0.1881

Notes: Standard errors in (). * at 010%, ** at 5%, *** at 1% significance level.

In Table 6, Panel A shows the analysis of financial distress forecast probability for 1999 to 2005, while Panel B presents the analysis of financial distress forecast probability for 1999 to 2006. The analyses equally indicate a 40% probability for the segmentation point which is a rather high accuracy rate. Thus, for the 2006 and 2007 forecasts, firms with a financial distress prediction probability rate higher than 0.4 are classified as financially distressed ones, while those obtaining lower than 0.4 are classified as regular firms.

Table 6. Financial distress prediction segmentation point probability analysis and accuracy rate

Segmentation point probability	Accuracy rate of regular firms	Accuracy rate of distressed firms	Total accuracy rate
Panel A. Analysis of financial distress prediction probability from 1999 to 2005			
0.2	50%	88.17%	62.72%
0.4	80.65%	61.29%	74.19%
0.5	85.48%	45.16%	72.04%
0.6	91.94%	34.41%	72.76%
0.8	98.92%	9.68%	69.18%
Panel B. Analysis of financial distress prediction probability from 1999 to 2006			
0.2	53.40%	84.47%	63.75%
0.4	83.01%	59.22%	75.08%
0.5	86.89%	39.81%	71.20%
0.6	93.20%	30.10%	72.17%
0.8	99.03%	7.77%	68.61%

The model in Table 5 serves as a projection factor in this study. Experimental verification in Panel A is done by using data from 2006 and adopts the overall sampling method. The number of observations for financial distress occurrence for 2006 is 10 and 1188 for regular firm observations. The variables substituted in each of the models are distinguished into 1 and 2 years prior to the financial distress outbreak. The segmentation point is set at 40% probability rate which is used to classify the accurate probability of prediction for financially distressed firms and financially sound firms. In Table 7, Panel A classifies the collective accuracy rate in the financial distress prediction model. The accuracy rates are estimated as follows. An independent variable of 1 represents a distressed firm, while a variable of 0 represents a regular firm. The classification accuracy rate in the financial distress prediction model refers to when the firm is predicted to be a distressed

firm (= 1) and a financial distress does occur based on actual observation (= 1), then it means the classification of the financially distressed firms is correct. On the other hand, when the firm is predicted to be a regular firm (= 0) and a financial distress does not occur based on actual observation (= 0), then it means the classification of the regular firm is correct. The classification accuracy rates of both kinds of firms are then calculated. For example, the classification accuracy rate of 10 financially distressed firms in the financial distress prediction model is 70% [$7/(3+7)=8/10$], and 70% [$828/(828+369)=828/1188$] for 1188 regular firms in the financial distress prediction model. The entire classification accuracy rate is 69.70% [$(828+7)/(828+360+3+7)=835/1198$]. The 2007 forecast of financial distress probability rate and accuracy rate in Panel B reached more than half. The result proves that corporate governance, CPA, and earnings manipulation variables can be used as reference factors in the financial distress model.

Table 7. Financial distress accuracy rate for 2006 and 2007 forecast (data pertaining to the 1-year and 2-year period prior to the financial distress)

Actual \ Forecast	Regular firm	Distressed firm	Percentage of accuracy
Panel A. 2006 Forecast			
Regular firm	828	3	69.70%
Distressed firms	360	7	70%
Number of firms	1188	10	69.70%
Panel B. 2007 Forecast			
Regular firm	747	4	59.76
Distressed firms	503	4	50%
Number of firms	1250	8	59.70%

Conclusion

The effect of the US financial turmoil is both broad and deep. Added to this fact there is the tightening of funds by banks and the public's lack of confidence. All these will inevitably affect corporate funding and give rise to cash flow difficulties. This type of financial situation makes hard-pressed firms fearful of a financial distress. Thus, the soundness of the corporate governance system is a key to sustaining a successful financial market. Based on the current corporate governance prevailing in this country, this article collects, classifies, and discusses all related local and foreign literature on corporate governance, functions of the board of directors, and

auditor opinion. Afterwards, the article aims to formulate a set of complete corporate governance models for the purpose of providing more diverse opinions and methods that would allow firms to prevent the occurrence of a financial distress.

This study uses Logit statistical model to examine the relevance of earnings management indicator, corporate governance, and auditor opinion variables on predicting the fundamental problems that cause a financial distress. The actual results reveal the following. With regard to earnings management standard, the range of earnings manipulation executed by a financially distressed firm is significantly different from that of a regular firm two years prior to the occurrence of financial distress. This implies that the management authorities of distressed firms may have substantially manipulated the earnings. As regards corporate governance and accounting opinion, directors concurrently serving as Managing Directors (*DUAL*), rate of pledged shares by the directors (*PLED*), and unfavorable audit opinion (*Auditor*) are greater than those of regular firms one year prior to the occurrence of financial distress.

The logistic regression model is used to build a financial distress prediction model by using earnings management indicator, corporate governance, and auditor opinion variables. These three variables make up the model. The actual facts reveal that shareholdings of directors and auditor opinion have the best forecast ability. The financial distress prediction model classification shows an accuracy rate of 70% for 2006 and 59.70% for 2007. These empirical results fit the three hypotheses of this research. The objective in building a financial distress prediction model in this study is to provide more diverse opinions and methods that would allow firms to prevent the likelihood of a financial distress. Furthermore, it aims to serve as an investment reference for both the public and business firms so that huge amounts of bad debts that will affect their respective operations may be avoided. Lastly, it is hoped that the study will assist the government agencies in issuing warnings and regulations to avoid becoming a victim of business cycles and financial distresses.

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