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Full Length Research Paper

Management ownership and corporate performance

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This paper primarily used statistical methods to establish financial early-warning models that made it possible to predict in advance the probability of a company experiencing financial distress, and raised corporate performance. In the empirical analysis, there may be the first study that attempted to use financial ratios and non-financial ratios such as ratio of director and supervisor ownership stakes after pledging of shares <5, 5 - 25, >25% as variables to analyze cross-holding groups. The study used the K-S, M-U tests and Logit regressions model. When the ratio was less than 5%, the main indicators showing the impact of dispersion of equity ownership upon corporate performance were the following factors, financial structure, solvency, and operating performance indicators. At 5 - 25%, the significant variables were ROS, ROE, and EPS influenced the corporate performance, while ownership stake of directors and supervisors was concentrating, ownership stake of executive officers would increase. To increase ownership stake of institutions, and avoid switch of CPAs and establishing independent directors and supervisors, may strengthen corporate governance. Beyond 25%, establishing independent directors and supervisors may strengthen corporate governance. At 5 - 25%, ownership stake of directors and supervisors, and ownership stake of executive officers were concentrating, establishing independent directors and supervisors may be lower to the likelihood of financial distress, and raised the corporate performance. Empirical test of a managerial implication on non-financial variable acted as an observation corporate performance. It can provide a reference for stockholders to observe corporate performance, and then to decide investment strategies. Corporate ownership and management changed, the mean contribution of this paper was that switch of CPAs and establishing independent directors and supervisors may be lower the likelihood of financial distress. This paper would be useful to researchers or practitioners who were focusing on management ownership and corporate governance implementation.

Key words: Corporate ownership, corporate governance, corporate performance, financial risk management.

INTRODUCTION

The objectives of most firms are market value added and for-profit firms, and limited liability is the best structure for large firms to have (Peslak, 2008). A company limited by shares is characterized by a separation between the managerial control of a professional CEO and the ownership rights of shareholders (Louise et al., 2007). This is intended to improve business performance (N'dri Konan Léon, 2007). However, this change in the form of ownership has given rise to agency problems (Chuang, 2007), including a family enterprise (Kleczyk, 2008), the fact that management and ownership are both in the same hands (a single person acts as both chairman of the board and CEO) can reduce agency costs (Boland, 2007). For an increasing concentration of large institutional shareholders (Azevedo et al., 2009), Cross-holdings, which indicate an increasing ownership stake held by major shareholders.

In the USA, when most companies in the early period were limited by the right of shares, and markets were not controlled by large corporations, but today this situation is changing. The present study primarily uses ratio of director and supervisor ownership stakes after pledging of shares, investigates the relation between the management ownership and corporate performance, considers

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endogenous variable. Following (Rafael et al., 1999) the largest firms in the richest economies precisely because, for these firms, the likelihood of widely dispersed ownership is to find wherever possible the identities of the ultimate owners of capital and of voting rights in firms, so when shares in a firm are owned by another company, presented the existence of pyramid structures and cross-holdings.

Yu (2009) indicated that the great company ownerships with managing the right nearly separates. Shareholders did not appoint or supervise a company manager directly, elect board committee think board committee choose and supervise a company manager. The company controls the right in manager's hand, and is supervised by the board committee. As ownership and management is separates, cause and act for the agency problems, it is as the manager and director take action run in the opposite direction with shareholder's benefit, or and the manager's incentive conflicts and contracts, or information asymmetry, produce and act the agency cost.

Rafael et al. (1999) used data on ownership structures of large corporations in 27 wealthy economies to identify the ultimate controlling shareholders of these firms found that, except in economies with very good shareholder protection, relative few of these firms are widely held, in contrast to Berle and Means (1932) image of ownership of the modern corporation. Rather, these firms are typically controlled by families or the State. It is business groups adopt diversification strategy, including pyramid structures and cross-holdings, monopoly or oligopoly.

Equity control by financial institutions is far less common (Smith, 2008; Gholamreza et al., 2009). The controlling shareholders typically have power over firms significantly in excess of their cash flow rights, primarily through the use of pyramids and participation in management. The present study builds on work done by Lieu et al. (2008), emphasize that the corporate governance and financial risk management, and study the direction in future is agency problems, can control the present shareholder in the business group, a few shareholders, specially the group shareholder.

In its empirical analysis, this is first study that attempts to use financial ratios and non-financial ratios, as ratio of director and supervisor ownership stakes after pledging of shares less than 5% (<5%),5 - 25%,beyond 25% (variable to analyze cross-holding groups, and the present study uses the K-S tests, and M-U tests and Logit regressions model.

This is the first study that attempts to use financial ratios and non-financial ratios as variables to analyze business groups, focusing on exchange-listed, OTC-listed, and emerging stock companies from Taiwan that experienced financial distress during a sampling period covering the years 2002 - 2007. More specifically, we carry out matched-pair analysis on 116 companies, selecting 58 pairs consisting of one distressed company and one non-distressed company that are similar in size and operating in the same industry. We employ Logit regression to establish an early-warning model, and made multiple discoveries. There are significant differences between corporate ownership and management changes.

(1) Ratio of director and supervisor ownership stakes after pledging of shares less than 5%, the stockholders right is dispersed it was found that financial structure, solvency, operating performance indicators influence the corporate performance.
(2) Between 5 - 25%, the significant variables is ROS, ROE, EPS influence the corporate performance, while ownership stake of directors and supervisors is concentrating, ownership stake of executive officers is increasing. Increase ownership stake of institutions, avoid switch of CPAs and establishing independent directors and supervisors, can strengthen corporate governance.
(3) Beyond 25%, establishing independent directors and supervisors can strengthen corporate governance.
(4) Beyond 5 - 25%, ownership stake of directors and supervisors, and ownership stake of executive officers is concentrating; establishing independent directors and supervisors can lower the likelihood of financial distress, and raise the corporate performance.

Generally, the Logit regression model has significant predictive power and is thus useful and effective in predicting distress. Predictive accuracy for distressed enterprises is above 90% over all time frames, ratio of director and supervisor ownership stakes after pledging of shares less than 5, 5 - 25%, beyond 25% with accuracy readings of 94.74, 90.91, 93.55%, one year prior to the occurrence of distress, 94.74, 90.32, 100% at two years prior, and 100, 90, 94.44% at three years prior.

LITERATURE REVIEW

The connection between ownership structure and performance has been the subject of an important and ongoing debate in the corporate finance and strategy literature. The empirical studies about the relation between both variable seem to have yielded conflicting results. Demsetz (1983) assess the validity of the Berle and Means's (1932) thesis, A linear regression of an accounting measure of profit rate on the fraction of shares owned by the five largest shareholding interests, gives no evidence of a relation between profit rate and ownership concentration. Deserts and Len (1985) provide evidence of the endogenous variable of a firm's ownership structure, in which ownership structure is treated as an endogenous variable, gives no evidence of a relation between profit rate and ownership structure. Morck et al. (1988) ignore the endogenous issue altogether and re-examine the relation between corporate ownership structure and performance. Like Demsetz and Lehn (1985), find no significant relation in the linear regressions. They

estimate using Tobin's Q and accounting profit rate as alternative measures of performance, and they also estimate a piecewise linear regression of Tobin's Q on insider ownership, and this does provide evidence of a non-monotonic relation. The estimated piecewise regression is positive for management holdings of shares between 0 and 5% of outstanding shares, negative for management holdings between 5 and 25%, and positive once more for management holdings greater than 25%.

Have Followed the Morck et al. (1988) study, included among these are McConnell and Servaes (1990); Hermalin and Weisbach (1988); Loderer and Martin (1997); Cho (1998) Himmelberg et al. (1999); Holderness et al. (1999); Demsetz and Villalonga (2001) and Chang (2003). All rely chiefly on Tobin's Q as a measure of firm performance, although a few also examine accounting profit rate, and all emphasize managerial shareholdings as a measure of ownership structure.

Differences abound across these studies, in measurements and sample used, in estimating technique applied, in whether and how they account for the endogenous variable of ownership structure, and in results obtained. The noteworthy one is the company take the exam of portion people hold by difference benefit by stock, investor different to hold bursts of policy decision different too position. The company shareholder mainly has outside shareholder, directors and supervisors, and the manager.

Because directors and supervisors and have more complicated relation people manager, this paper try and hold one distinguishes inside shareholders. As ratio of director and supervisor ownership stakes after pledging of shares less than 5, 5 - 25, beyond 25% variable to analyze ownership stake of directors and supervisors is concentrating, ownership stake of executive officers is increasing, the entrenchment incentive and inside monitoring power influence corporate performance, and suppose the two is endogenous and plausibly determined, among other factors, by firm performance itself. Oluwatoyin et al. (2009) used OLS method unable to express the three relations (Chang, 2003; Demsetz and Villalonga, 2001; Cho, 1998) used simultaneous equations and two-stage-least squares (2SLS), deal with and influence each other estimates of the ownership structure and corporate performance.

In this study we first use Pearson correlation tests on the 25 variables to eliminate collinear pattern carried out stepwise regression, and, finally, selected the significant variables instant of 2SLS (Lieu, et al. 2008), study result offer newly closing some and direction on ownership structure and corporate governance relevant research. Berle and Means (1932) call attention to the prevalence of widely held corporations in the United States, in which ownership of capital is dispersed among small shareholders, yet control is concentrated in the hands of managers. For at least two generations, their book has fixed the image of the modern corporation as one run by professional managers unaccountable to shareholders. The book stimulated an enormous "managerialist" literature on the objectives of such managers, including the important work of Baumol (1959), Marris (1964); Penrose (1959), Williamson (1964); Galbraith (1967); Jensen and Meckling (1976), and Grossman and Hart (1980). The Berle and Means image has clearly stuck.

In recent years, several studies have begun to question the empirical validity of this image. Eisenberg (1976); Demsetz (1983); Demsetz and Leh (1985); Shleifer and Vishny (1986) and Morck et al. (1988) show that even among the largest American firms, there is a modest concentration of ownership. Holderness and Sheehan (1988) have found in the United States several hundred publicly traded firms with majority, greater than 51% shareholders.

Kroszner and Sheehan (1999) have found, moreover, that management ownership in the United States today is higher than it was when Berle and Means (1932) wrote their study. Studies of other rich countries reveal more significant concentration of ownership in Germany, Edwards and Fisher (1994); and seven OECD countries (European Corporate Governance Network, 1997). La Porta et al. (1998) have found in developing economies, ownership is also heavily concentrated. This research suggests that in many countries large corporations have large shareholders and, further, that these shareholders are active in corporate governance (e.g., Kang and Shivdasani 1995), in contrast to the Berle and Means (1932) idea that managers are unaccountable.

In this paper we carry out a two-stage filtering of the variables, first use Pearson correlation tests and carried out stepwise regression, and, finally, selected the significant variables instant of 2SLS (Lieu et al. 2008).

METHODOLOGY

This session we will describe the methodology of the paper, such as sources of data, measurement of variables, and empirical model hypotheses. The present study primarily uses financial and non-financial information on listed business groups and other public companies, as obtained from the Taiwan Economic Journal, the Market Observation Post System web site, and the Taiwan Stock Exchange. This information is classified into two main groups based on whether the companies are distressed or not, and matched-pair analysis is performed. Based on five main aspects of financial statements, plus non-financial information relating to ownership structure and corporate governance, we select 36 ratios (28 key financial ratios and 8 non-financial ratios) and use them to perform independent variable analysis.

Sources of data

The range of the time period covered by the present study, 2002 - 2007, is based on the times when the research samples entered into distress. The sample research time period, 1999 - 2006, counts back from the time companies entered into distress, to one year prior, two years prior, and three years prior. We select 58 business groups that experienced distress during that time period, and use them as failed company samples, then carry out 1:1 matched-pair sampling using Beaver's matched-pair principle and perform non-random sampling. We select 58 non-distressed companies, thus

coming up with a total of 116 companies on which to perform normality K-S tests and M-U tests. We additionally select 41 non-distressed business groups with a total of 99 affiliates, plus 58 distressed companies, for a total of 157 companies, on which we performed Logit regression based on a matching principle of 1:1.7069.

Measurement of variables

The present study uses financial ratios and non-financial information (ownership structure and status of corporate governance) to establish a financial distress early-warning model. The financial variables used are financial ratios of five types that are often used in financial statement analysis, while our non-financial ratios are selected from information on individual companies, including their basic identifying information, CPA audit opinions, ownership structure, and ownership stakes of directors and supervisors. We select a total of 36 independent variables (28 financial variables and 8 non-financial variables), as shown here below in Table 1.

Statistical methods

The present study uses Logit regression to build a financial distress early-warning model for Taiwanese business groups.

Normality test (K-S test)

Employing a non-parametric Kolmogorov-Smirnov (K-S) test and assuming a significant level $\alpha = 0.05$, the present study tests each variable for normality given the following hypothesis:

H_0: Distribution of financial ratios is normal.
H_1: Distribution of financial ratios is abnormal.

If we obtain P-value < 0.05 significance level, we reject the null hypothesis H_0 and accept the alternative hypothesis H_1 that the distribution of the financial variables is abnormal.

M-U test of distressed and non-distressed companies

Employing a non-parametric Mann-Whitney-Wilcoxon Test (M-U) and assuming a significant level of $\alpha = 0.05$, the present study tests using the following hypotheses:

H_0: Parametric of financial ratios for the two subject groups are identical.
H_1: Parametric of financial ratios for the two subject groups are different.

If we obtain P-value < 0.05 significance level, we reject the null hypothesis H0 and accept the alternative hypothesis H1 that the parametric distribution of the two subject group financial variables is different.

EMPIRICAL RESULTS

Normality test for sample data

Examining the 36 variable ratios from one to three years prior to distress, we find that normality testing yields non-significant results (meaning acceptance of the null hypothesis H0 of a normal distribution) for all three years prior to distress only for EPS(X21), cash flow per share(X27), while the null hypothesis H0 is rejected for all other variable ratios, which led to the assumption of abnormal distribution. Accordingly, the present study employed a Logit model that assumed abnormal distribution to avoid bias and establish a better early-earning model for corporate financial distress (Table 2).

Test results

The M-U testing of financial and non-financial ratios of distressed and non-distressed companies is shown as follows.

1. The test results in Table 3 show that 25 of the variables used in the present study reached significance level, thus indicating that the financial and non-financial ratios selected for the present study are highly representative.
2. The test results also show that 25 of the variables exhibit significant differences in each of the three years prior to the occurrence of financial distress, while the null hypothesis H_0 is rejected for all other variable ratios, which led to the assumption of financial ratios for the two subject groups is different.

Accordingly, there are variables that can be used during the three years prior to the occurrence of financial distress to distinguish between companies that are likely to enter into financial distress and companies that are not, and raise the achievement result of the company.

Selection of variables

The test results in Table 3 show that 25 of the variables used in the present study exhibit significant differences in each of the three years preceding the occurrence of financial distress. The present study further analyzes the Pearson correlation coefficients of independent variables and eliminates highly correlated variables. P-values are used as the criterion for determining significance, with P < 0.05 denoting significant correlation. We carry out a two-stage filtering of the variables. We used

(1) The results of a normality test on financially distressed companies.
(2) The results of M-U testing on the financial ratios of financially distressed and non- distressed companies; and eliminate non-significant variables, which leaves 25 variables.

In step 2 we first use Pearson correlation tests on the 25 variables to eliminate collinear pattern carried out stepwise regression, and, finally, selected the significant variables.

Table 1. Variables, definitions and optimums.

Type	Name of variable	Definition	Optimum
Financial structure indicators	X_1 Debt ratio	Total debt / total assets	<50%
	X_2 Long-term funds	(Equity + long-term debt) / fixed assets	>100%
	X_3 adequacy ratio Own funds ratio	Net worth / total assets	>50%
Solvency indicators	X_4 Liquidity ratio	Current assets / current liabilities	>100%
	X_5 Quick ratio	Quick assets / current liabilities	>100%
	X_6 Times interest earned	(Earnings before tax + interest expenses)/ interest expenses	Higher the better
	X_7 Interest expense ratio	Cash from operating activities before interest and tax / interest expenses	>100%
Operating performance indicators	X_8 Receivables turnover	Net sales / Average receivables	3 times or higher
	X_9 Inventory turnover	Cost of sales / Average inventory	4 times or higher
	X_{10} Fixed asset turnover	Net sales / Average total fixed assets	3 times or higher
	X_{11} Equity turnover	Net sales / Average net worth	3 times or higher
	X_{12} Total assets turnover	Net sales / Average total assets	1.5 times or higher
	X_{13} Cash flow adequacy ratio	Net cash flow from operating activities / total debt	
	X_{14} Cash flow reinvestment ratio	(Net cash flow from operating activities– cash dividends) / gross fixed assets + Long term investments +other assets + working capital)	Higher the better
Profitability indicators	X_{15} Gross margin	Gross profit on sales / Net sales	Higher the better
	X_{16} Operating expense ratio	Operating expenses / Net sales	Lower the better
	X_{17} Operating margin	Operating income / net sales	Higher the better
	X_{18} ROS	Earnings before tax / net sales	Higher the better
	X_{19} After-tax margin	Net profit after tax / net sales	Higher the better
	X_{20} ROE	Net income / average net equity	Higher the better
	X_{21} EPS	Net profit after tax / weighted average share	Higher the better
	X_{22} Ratio of non-operating	Net non-operating revenue and expenses revenue and expenses/ net operating revenue	Higher, the Bigger the impact
	X_{23} Financial leverage	Total debt / total equity	Raising debt; Advantageous when leverage >1
	X_{24} ROA	(Net profit after tax + interest expenses (1 – income tax rate)) / Average total assets	Higher the better
	X_{25} Retention ratio	Earnings after distribution / net profit after tax	Higher, more stable
Cash flow indicators	X_{26} Cash flow ratio	Net cash flow from operating activities / current liabilities	
	X_{27} Cash flow per share	Net cash flow from operating activities / Weighted average shares outstanding	
	X_{28} Debt/equity ratio	Net cash flow from debt financing activities / (total debt + equity)	

Table 1. Contd.

	X_{29} Switch of CPAs	If the company has switched CPAs during the three years before entering into distress, the dummy variable is 1; if not, 0.
Corporate		If a CPA has given a qualified audit opinion audit
Governance	X_{30} CPA gives a qualified opinion	during the three years before the company enter distress, the dummy variable is 1; if not, 0
Indicators	X_{31} Chairman serves as CEO	If the chairman of the board serves as CEO, the dummy variable is 1; if not, 0.
.	X_{32} Establishment of independent directors and supervisors	If the company has no independent directors or supervisors, the dummy variable is 1; if it does, the variable is 0.
	X_{33} Ownership stake of	Shares owned by directors and supervisors / directors and supervisors shares outstanding
Ownership	X_{34} Ownership stake of Institutions	Shares owned by institutions / shares outstanding
Structure	X_{35} Ownership stake of	Shares owned by executive officers / shares executive officers outstanding
Indicators	X_{36} Share pledge ratio of directors and supervisors	Shares pledged by all directors and supervisors / shares held by directors and supervisors

Logit regression analysis

As Lieu et al. (2008) indicates ratios of director and supervisor ownership stakes after pledging of shares differ significantly between financially distressed and non-distressed companies. This study go a step, as ratio of director and supervisor ownership stakes after pledging of shares <5%, 5 to 25%, >25% variable to analyze cross-holding groups, The results of this analysis are shown in Tables 4, 5 and 6.

Ratio of director and supervisor ownership stakes after pledging of shares <5%

Using a goodness-of-fit method for our regression model, we found a *p*-value of -2 Log likelihood (deviation), which reached significance level and showed goodness-of-fit for our regression model at one year prior to the occurrence of financial distress (Table 4 and 5). Individual factors reaching significance level included debt ratio (X_1) and liquidity ratio (X_4) at one year prior, debt ratio (X_1) and total assets turnover (X_{12}) at two years prior, fixed asset turnover (X_{10}) at three years prior. When the ratio of director and supervisor ownership stakes after pledging of shares is less than 5 %, we observe fixed asset turnover (X_{10}; an operating performance indicator) at three years prior to distress and find that when an enterprise derives a good return on fixed assets, it shows that the frequency of turnover is high, which makes the company less likely to experience financial distress. We further observe total assets turnover (X_{12}; an operating performance indicator) at two years prior to distress and find that when an enterprise's ability to manage assets on behalf of its shareholders and creditors (i.e. it has too many idle assets, or sales revenues are too low), then the company is more likely to experience financial distress.

At the same time, we also observe the debt ratio (X_1; a financial structure indicator) and find that when the debt ratio is raised by an appropriate degree, if the company has good borrowing capacity and its financial structure is good, then the availability of a source of capital can improve the company's solvency and make it less likely that the company will experience financial distress. Observation at one year prior to distress shows that an excessively low debt ratio (X_1) makes a company unable to employ leverage, which increases the likelihood of the company experiencing financial distress. At the same, we also observe that appropriately raising the current ratio (X_4; a solvency indicator) strengthens the company's solvency and lowers the likelihood of the company experiencing financial distress.

Ratio of director and supervisor ownership stakes after pledging of shares 5 - 25%

Using a goodness-of-fit method for our regression model, we find a P-value of -2 Log likelihood (deviation), which reaches significance level and shows goodness-of-fit for our regression model at one, two, and three years prior to the occurrence of financial distress (Tables 5 and 7). Individual factors reaching significance level at one year prior

Table 2. Normality test (K-S test).

Code	Name of variable	One year prior	Two years prior	Three years prior
		p-value	*p*- value	*p*-value
X_1	Debt ratio	00.000**	0.000**	0.001**
X_2	Long- term funds adequacy ratio	00.000**	0.000**	0.000**
X_3	Own funds ratio	00.000**	0.000**	0.001**
X_4	Liquidity ratio	00.009**	0.004**	0.000
X_5	Quick ratio	00.046*	0.003**	0.000**
X_6	Times interest earned	00.000**	0.000**	0.000**
X_7	Interest expense ratio	00.000**	0.000**	0.000**
X_8	Receivables turnover	00.000**	0.000**	0.000**
X_9	Inventory turnover	00.000**	0.000**	0.000**
X_{10}	Fixed asset turnover	00.000**	0.000**	0.000**
X_{11}	Equity turnover	00.049*	0.162	0.088
X_{12}	Total assets turnover	00.007**	0.139	0.119
X_{13}	Cash flow adequacy ratio	00.000**	0.000**	0.000**
X_{14}	Cash flow reinvestment ratio	00.000**	0.018*	0.016*
X_{15}	Gross margin	00.005**	0.002**	0.264
X_{16}	Operating expense ratio	00.000**	0.000**	0.002**
X_{17}	Operating margin	00.001**	0.000**	0.000**
X_{18}	ROS	00.000**	0.000**	0.000**
X_{19}	After-tax margin	00.000**	0.000**	0.007**
X_{20}	ROE	00.131	0.014*	0.284
X_{21}	EPS	00.070	0.064	0.497
X_{22}	Ratio of non-operating revenue and expenses	00.000**	0.000**	0.000**
X_{23}	Financial leverage	00.000**	0.000**	0.000**
X_{24}	ROA	00.009**	0.061	0.457
X_{25}	Retention ratio	00.022*	0.076	0.022*
X_{26}	Cash flow per share	00.071	0.146	0.358
X_{28}	Debt/equity ratio	00.005**	0.227	0.283
X_{29}	Switch of CPAs	00.000**	0.000**	0.000**
X_{30}	CPA gives a qualified audit opinion	00.000**	0.000**	0.000**
X_{31}	Chairman serves as CEO	00.000**	0.000**	0.000**
X_{32}	Independent directors and supervisors	00.000**	0.000**	0.000**
X_{33}	Ownership stake of directors and supervisors	00.011*	0.007**	0.004**
X_{34}	Ownership stake of Institutions	00.000**	0.000**	0.000**
X_{35}	Ownership stake of executive officers	00.000**	0.000**	0.000**
X_{36}	Share pledge ratio of directors and supervisors	00.021*	0.016*	0.015*

*and **represent statistical significance at $p<0.05$, and $p<0.01$, respectively.

prior to distress include debt ratio (X_1), times interest earned (X_6), interest expense ratio (X_7), equity turnover (X_{11}), ROS (X_{18}), and after-tax margin (X_{19}). Factors reaching significance level at two years prior to distress include cash flow adequacy ratio (X_{13}), ROE(X_{20}), retention ratio (X_{25}), switch of CPAs (X_{29}), establishment of independent directors and supervisors (X_{32}), and ownership stake of executive officers (X_{35}). Factors reaching significance level at three years prior to distress include own funds ratio (X_3), inventory turnover (X_9), cash flow adequacy ratio (X_{13}), EPS (X_{21}), establishment of independent directors and supervisors (X_{32}), ownership stake of institutions (X_{34}), and share pledge ratio of directors and supervisors (X_{36}).

When a company's directors and supervisors hold a combined equity stake of 5 to 25%, individual factors reaching significance level at three years prior to distress include one financial structure indicator (own funds ratio, [X_3]), two operating performance indicators (inventory turnover [X_9] and cash flow adequacy ratio [X_{13}]), one profitability indicator (EPS [X_{21}]), and one ownership structure indicator (share pledge ratio of directors and supervisors [X_{36}]). We find upon observation that when indicators for the company's financial structure, operating

Table 3. M-U test on the distressed and non-distressed companies.

Variable		One year prior	Two years prior	Three years prior
Code	**Name of variable**	***p*-value**	***p*- value**	***p*-value**
X_1	Debt ratio	0.000**	0.000**	0.000**
X_2	Long- term funds adequacy ratio	0.000**	0.001**	0.011**
X_3	Own funds ratio	0.000**	0.000**	0.000**
X_4	Liquidity ratio	0.000**	0.000**	0.001**
X_5	Quick ratio	0.000**	0.000**	0.001**
X_6	Times interest earned	0.000**	0.000**	0.000**
X_7	Interest expense ratio	0.000**	0.000**	0.213
X_8	Receivables turnover	0.071	0.007**	0.000**
X_9	Inventory turnover	0.031*	0.046*	0.059
X_{10}	Fixed asset turnover	0.000**	0.001**	0.001**
X_{11}	Equity turnover	0.408	0.298	0.145
X_{12}	Total assets turnover	0.000**	0.001**	0.001**
X_{13}	Cash flow adequacy ratio	0.000**	0.000**	0.000**
X_{14}	Cash flow reinvestment ratio	0.002**	0.018*	0.255
X_{15}	Gross margin	0.000**	0.005**	0.037*
X_{16}	Operating expense ratio	0.000**	0.000**	0.001**
X_{17}	Operating margin	0.000**	0.000**	0.000**
X_{18}	ROS	0.000**	0.000**	0.000**
X_{19}	After-tax margin	0.000**	0.000**	0.280
X_{20}	ROE	0.000**	0.000**	0.000**
X_{21}	EPS	0.000**	0.000**	0.000**
X_{22}	Ratio of non-operating revenue and expenses	0.000**	0.000**	0.000**
X_{23}	Financial leverage	0.000**	0.000**	0.001**
X_{24}	ROA	0.000**	0.000**	0.000**
X_{25}	Retention ratio	0.000**	0.000**	0.000**
X_{26}	Cash flow ratio	0.000**	0.000**	0.000**
X_{27}	Cash flow per share	0.000**	0.000**	0.010*
X_{28}	Debt/equity ratio	0.000**	0.000**	0.000**
X_{29}	Switch of CPAs	0.000**	0.000**	0.000**
X_{30}	CPA gives a qualified audit opinion	0.000**	0.000**	0.000**
X_{31}	Chairman serves as CEO	0.118	0.118	0.118
X_{32}	Establishment of independent directors and supervisors	0.000**	0.000**	0.000**
X_{33}	Ownership stake of directors and supervisors	0.003*	0.124	0.839
X_{34}	Ownership stake of Institutions	0.148	0.943	0.437
X_{35}	Ownership stake of executive officers	0.044*	0.282	0.014*
X_{36}	Share pledge ratio of directors and supervisors	0.035*	0.084	0.053

*,and **represent statistical significance at $p<0.05$, and $p<0.01$,respectively.

performance, and profitability decline in conjunction with a real increase in the share pledge ratio of directors and supervisors increases, appropriately increasing the ownership stake of institutions (X_{34}, an ownership structure indicator) can improve the company's supervisory capacity, otherwise the company's likelihood of experiencing financial distress increases.

At two years prior to financial distress, a lowering in the cash flow adequacy ratio (X_{13}; an operating performance indicator), ROE (X_{20}; a profitability indicator), or the retention ratio means a higher likelihood of financial distress. At this point, corporate governance performance can be improved by raising the ownership stake of executive officers (X_{35}; an ownership structure indicator), avoiding a switch of CPAs (X_{29}; a corporate governance indicator), establishing independent directors and supervisors (X_{32}; a corporate governance indicator), and strengthening oversight by outsiders of the company's operations. The improvement in corporate governance performance lowers the likelihood of financial distress, and

Table 4. Logit early-warning model: ratio of director and supervisor ownership stakes after pledging of shares < 5%.

Year to distress	Variable	Estimated β parameter	p-value	Indicators
One year prior	Intercept (Constant)	-0.920	0.566	
X_1	Debt ratio	-0.059	0.042*	Financial structure
X_4	Liquidity ratio	0.027	0.068	Solvency
Two years prior	Intercept (Constant)	-30.657	0.241	
X_1	Debt ratio	0.124	0.065	Financial structure
X_{12}	Total assets turnover	-30.262	0.077	Operating performance
Three years prior	Intercept (Constant)	-30.413	0.005**	
X_{10}	Fixed asset turnover	0.312	0.045*	Operating performance

*,and **represent statistical significance at $p<0.05$ and $p<0.01$, respectively.

Table 5. Logit early-warning model: ratio of director and supervisor ownership stakes after pledging of shares 5 to 25%.

Year to distress	Estimated		
	Variable	β Parameter	p-value indicators
One year prior Intercept (Constant)	7.465	0.006**	
X_1 Debt ratio	-0.064	0.009**	Financial structure
X_6 Times interest earned	0.125	0.030*	Solvency
X_7 Interest expense ratio	0.065	0.060	Solvency
X_{11} Equity turnover	-1.586	0.045*	Operating performance
X_{18} ROS	-0.011	0.084	Profitability
X_{19}After-tax margin	0.76E-05	0.024*	Profitability
Two years prior Intercept (Constant)	-9.088	0.004**	
X_{13} Cash flow adequacy ratio	-0.016	0.038*	Operating performance
X_{20} ROE	-0.117	0.019*	Profitability
X_{25} Retention ratio	0.051	0.048*	Profitability
X_{29} Switch of CPAs	2.859	0.032*	Corporate governance
X_{32} Establishment of independent directors and supervisors	5.039	0.001**	Corporate governance
X_{35}Ownership stake of executive officers	2.012	0.006**	Ownership structure
Three years prior Intercept (Constant)	2.818	0.150	
X_3 Own funds ratio	-0.064	0.056	Financial structure
X_9 Inventory turnover	-0.044	0.094	Operating performance
X_{13} Cash flow adequacy ratio	-0.026	0.004**	Operating performance
X_{21} EPS	-0.322	0.093	Profitability
X_{32} Establishment of independent directors and supervisors	3.823	0.001**	Corporate governance
X_{34} Ownership stake of Institutions	0.624	0.002**	Ownership structure
X_{36} Share pledge ratio of directors and supervisors	-0.822	0.085	Ownership structure

*and **represent statistical significance at $p<0.05$, and $p<0.01$, respectively.

can improve corporate performance.

At one year prior to financial distress, the likelihood of financial distress increases if there is a decrease in the debt ratio (X_1; a financial structure indicator), equity turnover (X_{11}; an operating performance indicator), and receivables turnover (X_8; a profitability indicator). At the same time, however, an appropriate increase in times interest earned (X_6; a solvency indicator), interest expense ratio (X_7; a solvency indicator), and after-tax margin (X_{19}; a profitability indicator) lowers the likelihood of financial distress, which will improve corporate performance.

Table 6. Logit early-warning model: ratio of director and supervisor ownership stakes after pledging of shares > 25%.

Years to distress	Estimated		
	β Parameter	*p*-value	Indicators
One year prior intercept (Constant)	-3.046	0.038*	
X_7 Interest expense ratio	-.730	0.049*	Solvency
Two years prior intercept (Constant)	-13.141	0.016*	
X_1 Debt ratio	0.158	0.033*	Financial structure
X_{16} Operating expense ratio	0.181	0.081	Profitability
X_{32} Establishment of independent directors and supervisors	3.093	0.096	Corporate governance
Three years prior intercept (Constant)	-14.773	-14.773	
X_{16} Operating expense ratio	0.591	0.056	Profitability
X_{26} Cash flow ratio	-0.132	0.044*	Cash flow
X_{32} Establishment of independent directors and supervisors	9.014	0.040*	Corporate governance

*and **represent statistical significance at $p<0.05$, and $p<0.01$, respectively.

Ratio of director and supervisor ownership stakes after pledging of shares >25%

Using a goodness-of-fit method for our regression model, we found a *p*-value of -2 Log likelihood (deviation), which reached significance level and showed goodness-of-fit for our regression model at one year prior to the occurrence of financial distress (Tables 6 and 7). Individual factors reaching significance level included interest expense ratio (X_7) at one year prior to distress, debt ratio (X_1), operating expense ratio (X_{16}), and establishment of independent directors and supervisors (X_{32}) at two years prior, and operating expense ratio (X_{16}), cash flow ratio (X_{26}), and establishment of independent directors and supervisors (X_{32}) at three years prior.

When a company's directors and supervisors hold a combined equity stake of > 25%, if cash flow ratio (X26; a cash flow indicator) declines at three years prior to distress, then the company is more likely to experience financial distress. At the same time, however, if the operating expense ratio (X_{16}; a profitability indicator) rises, the company establishes independent directors and supervisors (X_{32}), and corporate governance performance is strengthened, then the company is less likely to experience financial distress, and corporate performance can improve.

At two years prior to financial distress, the likelihood of financial distress decreases and corporate performance improves to the extent that there is an appropriate increase in the debt ratio (X_1; a financial structure indicator) and the operating expense ratio (X_{16}; a profitability indicator), independent directors and supervisors are established (X_{32}), and the company strengthens its borrowing capacity, profitability, and corporate governance performance.

At one year prior to financial distress, a drop in the interest expense ratio (X_7; a solvency indicator) indicates that the company's earnings before interest and tax (EBIT) are insufficient to pay off loan interest, which increases the likelihood of the company experiencing financial distress.

Testing goodness-of-fit for the Logit early-warning model

Table 7 shows on ratio of director and supervisor ownership stakes after pledging of shares <5% predictive accuracy of 94.74% at one year prior to distress 94.74% at two year prior to distress, and 100% at three year prior to distress, on 5 - 25% predictive accuracy of 90.91% at one year prior to distress 90.32% at two year prior to distress, and 90% at three year prior to distress, on >25% predictive accuracy of 93.55% at one year prior to distress 100% at two year prior to distress, and 94.44% at three year prior to distress, which means that the financial early-warning models is acceptable and effective at one, two, and three years prior to financial distress.

MANAGERIAL IMPLICATIONS

There are generally significant differences between the financial and non-financial ratios of distressed and non-distressed companies. In carrying out regression analysis, we make a distinction between three different ratios of director and supervisor ownership stake after pledging of shares: < 5%, 5 - 25%, and > 25%. Predictor variables at < 5% include one financial structure indicator (debt ratio, X_1), one solvency indicator (current ratio, X_4), and two operating performance indicators (fixed asset turnover, X_{10} and total assets turnover, X_{12}). Predictor variables

Table 7. Testing goodness-of-fit for the Logit early-warning model.

Model	One year prior	Two years prior	Three years prior
Ratio of director and supervisor ownership stakes after pledging of shares < 5%			
-2 Log likelihood	13.567	12.046	10.988
Cox and Snell R^2	0.428	0.462	0.362
Nagelkerke R^2	0.642	0.692	0.590
Predictive accuracy (%)	94.740	94.740	100.000
Ratio of director and supervisor ownership stakes after pledging of shares5-25%			
-2 Log likelihood	020.916	27.457	32.792
Cox and Snell R^2	0.652	0.622	0.592
Nagelkerke R^2	0.909	0.869	0.836
Predictive accuracy (%)	90.910	90.320	90.000
Ratio of director and supervisor ownership stakes after pledging of shares > 25%			
-2 Log likelihood	7.079	11.823	9.557
Cox and Snell R^2	0.530	0.522	0.576
Nagelkerke R^2	0.847	0.792	0.854
Predictive accuracy (%)	93.550	100.000	94.440

at 5 - 25% include two financial structure indicators (debt ratio, X_1; own funds ratio, X_3), two solvency indicators (times interest earned, X_6; interest expense ratio, X_7), three operating performance indicators (equity turnover, X_{11}; inventory turnover, X_9; cash flow adequacy ratio, X_{13}), five profitability indicators (ROS, X_{18}; after-tax margin, X_{19}; ROE, X_{20}; EPS, X_{21}; and retention ratio, X_{25}), three ownership structure indicators (ownership stake of institutions, X_{34}; ownership stake of executive officers, X_{35}; share pledge ratio of directors and supervisors, X_{36}), and two corporate governance indicators (switch of CPAs, X_{29}; establishment of independent directors and supervisors, X_{32}). Predictor variables at > 25% include one financial structure indicator (debt ratio, X_1), one solvency indicator (interest expense ratio, X_7), one profitability indicator (operating expense ratio, X_{16}), one cash flow indicator (cash flow ratio, X_{26}), and one corporate governance indicator (establishment of independent directors and supervisors, X_{32}).Our findings upon analysis of empirical results are as thus discussed.

Principal indicators of the impact of dispersion of equity ownership upon corporate performance: Financial structure indicators; solvency indicators; and operating performance indicators

When the ownership stake of internal directors and supervisors < 5%, it is advisable for a company to take on an appropriate amount of debt to increase its borrowing capacity and current ratio, improve its financial structure and solvency, increase its return on fixed assets and return on assets, and improve its operating performance. This will reduce the likelihood of financial distress and enable better corporate performance.

5 - 25%, the significant variables is ROS ROE EPS influence the corporate performance

At 5 - 25℃, the significant variables are ROS, ROE, and EPS influence the corporate performance, while ownership stake of directors and supervisors is concentrating, ownership stake of executive officers is increasing. Increase ownership stake of institutions, avoid switch of CPAs and establishing independent directors and supervisors, can strengthen corporate governance.

Ownership stake of executive officers is increasing, increase ownership stake of institutions, and establishing independent directors and supervisors, can strengthen corporate governance. Ownership stake of executive officers is increasing, avoid switch of CPAs and establishing independent directors and supervisors, can strengthen corporate governance.

As the ownership increases remaining show that inside ownership stake of directors and supervisors is concentrating, and ownership stake of executive officers entrenchment incentive is stronger. Increase outsiders ownership stake of institutions, avoid switch of CPAs and establishing independent directors and supervisors, can strengthen inside monitoring power, lower the likelihood of financial distress, and raise the corporate performance.

Empirical test a managerial implication on non-financial variable acts as an observation corporate performance. It

can provide a reference for stockholders to observe corporate performance and then to decide investment strategies.

In Table 4, 5 and 6, we had found out the significant variables for different ownership structure impact on the corporate performance.

DISCUSSION AND CONCLUSION

As the ownership increases remaining show that inside ownership stake of directors and supervisors is concentrating, and ownership stake of executive officers entrenchment incentive is stronger. Increase outsiders ownership stake of institutions, avoid switch of CPAs and establishing independent directors and supervisors, can strengthen inside monitoring power, lower the likelihood of financial distress.

Distribution of financial ratio variables is abnormal

For our normality test, the present study selects a total of 36 variables (28 financial ratio variables, 8 non-financial ratio variables). Examining the 36 variables from one year to three years prior to distress, results for 34 variables are negative for three consecutive years, which means a rejection of the null hypothesis H_0 and an abnormal distribution. Accordingly, the present study employs a Logit model that assumes abnormal distribution to avoid bias and establish a better early-warning model for corporate financial distress.

Financial ratio variables show significant differences

The results of our t-test show that parameter differences for 25 of the variables for the financial and non-financial ratios of the distressed and non-distressed companies reach significance level at one, two, and three years prior to financial distress, thus indicating that the variables selected for the present study are highly representative. It also indicates significant difference for 25 variables in each of the three years prior to financial distress, for which reason we reject the null hypothesis H_0 and accept the alternative hypothesis H_1, and t-testing of financial and non-financial ratios of distressed and non-distressed companies yielded different results. Accordingly, there are variables that can be used during the three years prior to the occurrence of financial distress to distinguish between companies that are likely to enter into financial distress and companies that are not. Such variables serve an early-warning function.

> Financial structure, solvency, profitability, operating performance, profitability, cash flow, ownership structure, and corporate governance indicators account for most of the significant variables

This paper employs Logit regression to carry out a two-stage (e.g. Pearson correlation analysis and two-step regression) variable selection from among 36 financial and non-financial ratio variables, breaking down the results into categories based on the share of actual ownership held by directors and supervisors (<5%; 5 - 25%; > 25%), to develop an early-warning model that can be used to predict the occurrence of financial distress in Taiwanese business groups at one, two, and three years before the fact.

(a) With an ownership stake of < 5% in the hands of directors and supervisors, predictor variables include one financial structure indicator (debt ratio [X_1]), one solvency indicator (current ratio [X_4]), and two operating performance indicators (fixed asset turnover [X_{10}] and total assets turnover [X_{12}]).
(b) With an ownership stake of 5 - 25% in the hands of directors and supervisors, predictor variables include two financial structure indicators (debt ratio [X_1] and own funds ratio [X_3]), two solvency indicators (interest coverage ratio [X6], interest expense ratio [X_7]), three operating performance indicators (inventory turnover [X_9], equity turnover [X_{11}], cash flow adequacy ratio [X_{13}]), five profitability indicators (ROS [X_{18}], after-tax margin [X_{19}], ROE [X_{20}], EPS [X_{21}], retention ratio [X_{25}]), three ownership structure indicators (ownership stake of institutions [X_{34}], ownership stake of executive officers [X_{35}], share pledge ratio of directors and supervisors [X_{36}]), and two corporate governance indicators (switch of CPAs [X_{29}], establishment of independent directors and supervisors [X_{32}]).
(c) With an ownership stake of > 25% in the hands of directors and supervisors, predictor variables include one financial structure indicator (debt ratio [X_1]), one solvency indicator (interest expense ratio [X_7]), one profitability indicator (operating expense ratio [X_{16}]), one cash flow indicator (cash flow ratio [X_{26}]), and one corporate governance indicator (establishment of independent directors and supervisors [X_{32}]).
(d) Logit regression can be an effective means of predicting financial distress:

The Logit regression model has significant predictive power and is thus useful and effective in predicting distress. With an ownership stake of < 5% in the hands of directors and supervisors, predictive accuracy for distressed enterprises is 94.74% at one year prior to the occurrence of distress, 94.74% at two years prior, and 100% at three years prior. With an ownership stake of 5 - 5% in the hands of directors and supervisors, predictive accuracy is 90.91% at one year prior to distress, 90.32% at two years prior, and 90% at three years prior. With an ownership stake of > 25% in the hands of directors and supervisors, predictive accuracy is 93.55% at one year prior to distress, 100% at two years prior, and 94.44% at three years prior. This shows that Logit regression can be an effective means of predicting financial distress.

(e) Empirical test a managerial implication on non-financial variable acts as an observation corporate performance.

REFERENCES

Alan DS (2008). Forecasting case studies: leveraging strategic management and project integration. Int. J. Manage. Enter. Dev., 5(1): 63-76.

Alan RP (2008). Article title: organizational information systems: rate of return and influencing variables as viewed by top financial executives. Indust. Manage. Data Syst., 108 (1): 43-59.

Azevedo DB, Pedrozo EÁ, Silva TN, Malafaia GC (2009). The influence of stakeholders in environmental management process: A systemic complexity perspective in agribusiness. Afr. J. Bus. Manage., 3 (5): 191-199.

Baumol W (1959). Business behavior, value and growth. MacMillan N.Y.

Berle A, Means G (1932). The modern corporation and private property. Harcourt. Brace. and World. N. Y.

Chang SJ (2003). Ownership structure expropriation and performance group-affiliated companies in Korea: Korea Uni. Acad. of Manage. J., 46(2): 238-253.

Cho MH (1998). Ownership structure investment and the corporate value: An Empirical Analysis. J. Financ. Econ., 103-121.

Chuang TT, Matthew WR, Lin BS (2007). Owner/manager characteristics, organizational characteristics and IT adoption in small and medium enterprises. Int. J. Manage. Enter. Dev., 4(6): 619-634.

Demsetz H, Villalonga B (2001). Ownership structure and corporate performance. J. Corp. Financ., 7: 209-233.

Demsetz H (1983). The structure of ownership and the theory of the firm. J. Law and Econ., 26: 375-390.

Demestz H, Lehn K (1985).The structure of corporate ownership: causes and consequences. J. Polit. Econ., 93:1155-1177.

Edwards J, Fisher K (1994). Cambridge banks, finance and investment in West Germany since 1970. University Press. Cambridge. U.K.

Eisenberg M (1976).The structure of the corporation: A legal analysis. Little, Brown and Co. Boston, Mass.

Ewa K (2008). Risk management in the development of new products in the pharmaceutical industry. Afr. J. Bus. Manage., 2 (10): 186- 194.

Galbraith JK (1967). The new industrial state. Houghton-Mifflin. Boston. Mass.

Gholamreza J, Hasan ZM, Ali F (2009). Comparing transformational leadership in successful and unsuccessful companies. Afr. J. Bus. Manage., 3 (7): 272-280.

Grossman S, Hart O (1980). Takeover bids, the free-rider problem, and the theory of the corporation. Bell J. Econ., 11: 42-64.

Himmelberg C, Hubbard RG, Palia D (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. J. Financ. Econ., 53: 353-384.

Hermalin B, Weisbach M (1988). The Determinants of board composition. RAND . J. Econ., 19: 589-606.

Holderness C, Randall K, Dennis S (1999). Were the good old days that good? changes in managerial stock ownership since the Great Depression. J. Financ., 54: 435-469.

Holderness C, Sheehan D (1988). The rule of majority shareholders in publicly hold corporations: An exploratory analysis. J. Financ. Econ., 20: 317-346.

Jensen M, Meckling W (1976). Theory of the firm managerial behavior, agency cost and ownership structure. J. Financ. Econ., 3: 305-360.

Kang JK, Shivdasani A (1995). Firm performance, corporate governance, and top executive turnover in Japan. J. Financ. Econ., 38: 29-58.

La Porta R, Lopez-de-Silanes F, Shleifer A (1999). Corporate ownership around the world. J. Financ., 65:471-517.

Lieu PT, Lin CW, Yu HF (2008). Financial early-warning models on cross-holding groups. Indus. Manage. Data Sys., 108 (8):1060-1080.

Loderer C, Martin K (1997). Executive stock ownership and performance: tracking faint traces. J. Financ. Econ., 45: 223-255.

Louise VS, Simon R (2007). Why are so many managers not “managing?” Afr. J. Bus. Manage., 1 (4): 85-91.

Marris R (1964). The economic theory of managerial capitalism. Free Press, Glencoe, Illinois.

Michael B, William HR (2007). The impact of self-monitoring on the negotiation of emotionally Laden and non-emotionally Laden Issues. Int. J. Manage. Enter. Dev., 4(6): 674-692.

Morck R, Shleifer A, Vishny R (1988). Management ownership and market valuation: an empirical analysis. J. Financ. Econ., 20: 293-315.

McConnell J, Servaes H (1990). Additional evidence on equity ownership and corporate value. J. Financ. Econ., 27: 595-612.

N’dri KL (2007). Stock market returns and volatility in the BRVM. Afr. J. Bus. Manage., 1 (5): 107-112.

N’dri KL (2007). An empirical study of the relation between stock return volatility and trading volume in the BRVM. Afr. J. Bus. Manage., 1(7): 176-184.

Oluwatoyin M, Gbadebo OO (2009). The impact of share market capitalization on a company’s performance: a case study in the Nigerian confectionary industry. Afr. J. Bus. Manage., 3 (5): 220-226.

Penrose E (1959). The theory of the growth of the firm, Basil Blackwell, Oxford, U.K.

Shleifer A, Vishny R (1986). Large shareholders and corporate control. J. Polit. Econ., 94: 461-488.

Williamson O (1964). The economics of discretionary behavior: managerial objectives in a theory of the firm. Prentice Hall, Englewood Cliffs. N. J.

Yu HF (2009). An empirical study of ownership structure, performance and corporate value. J. Glob. Manage. Econ., 5(1):1-21.