# An Empirical Study of the Relationship between Corporate Information Disclosure and Financial Distress

**Benjamin Ombok*** **Dr. David Oima**** **Dave Sande*****

***Abstract***

*The purpose of this study is to analyze the relationship between corporate information disclosure and financial distress. From the Securities and Futures Institute network, we collected the financial data of the stock listing companies in the Taiwan Security Exchange (TSF.) and Ore Tai Securities Market ((GTSM). We used logistic regression model to find out financial indices that have significant difference in different financial stages and corporate information disclosure conditions. The test results revealed that the level of information disclosure is significantly related to financial distress.*

## 1. INTRODUCTION

Speaking of Asian financial disaster initiated from the end of last century Enron event, and the successive frauds of accounting from some of international enterprises, such as, Xerox, WorldCom Group, Merck & Co., and Bristol-Myers Squibb Co., "corporate management" is getting more and more valuable.

Mass media and investment institutes consider corporate management as an important gauge of in vest-worthy after these scandals. SFB demands newly listed companies in the market or OTC to practice corporate management that seems to become an important indicator of enterprise development. Following Asian financial disaster in 1997, Enron event in 2001 and scandal of WorldCom Group in 2002, there are decades of fraudulent cases in Taiwan in these recent years. The public lose the confidence in the capital market because of the sequent enterprise frauds, which is nominally caused by false financial statements or bankruptcy. Actually, these frauds are resulted from the weak supervision of directorate, high level personnel's manipulation of P&L and bad operating environments, and may be someone steals benefit from that. To improve enterprise information disclosure and management mechanism and recall the investors' confidence, in 2003, SFB started to evaluate the information disclosure of all companies in the market and OTC, and then announced the results on its website. Then the supervising institute in Taiwan began to establish observation stations of enterprises public information and review the revision of disclosure systems. These measures suppose the outer supervisors to prompt enterprises to fulfill management mechanism by means of enterprise information disclosure.

Information disclosure means immediate and proper announcement of enterprise management and financial performance. The investors will welcome the transparency of enterprise information and like to invest in highly open-hearted enterprise, because they want their money to be invested in the excellently efficient corporations, rather than in the highly risky ones. The transparent ones have the least possibility to undergo immense accidents, so they may be the berth of the investors' money. On the other hand, the invisible ones may be dug out something unfavorable anytime and anywhere, which usually leads to a horrible disaster of an enterprise and decrease of investment interest. Although increase of transparency will increase the cost of enterprise simultaneously, there are many foreign cases that the investors' high appreciation reflects on high transparency of enterprise. And the value of appreciation is far more than the cost. Additionally, the high transparency will reduce the effect of profit management and weaken the interest and stimulus of it (Lobo and Zhou (2001), Hunton *et al*, (2004)). The research from Hunton *et al.*, (2004) pointed out that the managers thought it wouldn't be found if they tampered the profit, and profit management would be favorable for the stock price of their own companies and wouldn't hurt their reputation. On the contrary, high transparency of enterprise information is prone to be found while doing profit management that'll be unfavorable for the stock price and personal reputation so that the managers are unwilling to do it. As we know from the above, the higher transparency the information is the - more unwillingly for enterprise to do profit management. Based on the above motif, the purpose of this article is to probe if information disclosure is helpful to intensify the enterprise management and effective to reduce the possibility of enterprise financial distress.

## 2. LITERATURE REVIEW

The meanings of financial distress are not exactly the same everywhere. It is named according to Chapters 10 and 11 of Bankruptcy Law in U.S A. And it is defined by Cheng and Li (2003) and separated into static and dynamic models. The former is stipulated by statutes, such as, Altman (1968), Blum (1974), Ohison (1980), and Zmijewski (1984). The latter is defined by the stages of enterprise crisis, such as, Beaver (1966), Deakin (1972), Scott (1976), Foster (1978), Lau (1987') and Laitinen (1.991). Considering the amount of samples has no big differentiation, the real definition of financial distress in this article indicates the static model.

After reading the related research about financial distress, most scholars set up the precautionary model of financial distress which provided us with finance or management variables. The following are some examples. Beaver (1966) provided with cash flow, debt ratio and return ratio of asset. Altman (1968) provided with operation capital/overall capital, net profit before taxes and dividend, ratio of' long-term capital and ratio of overall capital turnover. Blum (1974) provided with ratio of equity capital and acid-test ratio. Shiu and Lo (2003) provided with interest rate, inflation rate, and yield, return ratio of stock and reinvestment ratio to establish precautionary system of insurance company Ohison (1980) and Platt (2002) also provided with variables of finance ratio to set up the precautionary model of financial distress. Daily and Dalton (1994), set up the precautionary model of financial distress by providing with management variables, which is testified to improve the accuracy of the bankruptcy precautionary model. Hardly do the researches analyze the relevance

among the variables before establishing the precautionary model of financial distress. So, we try to analyze the relationship between corporate information disclosure and financial distress.

We found that the improvement of enterprise transparency can make progress of corporation management, which is told in the statutes and practicing norms formulated by OECD. High transparency symbols low cost because of low market risk, and also perform positive financial effect. The bigger, more effective and closer earning/return relevant the company is, the more information disclosure is made (Lang and Lundholm (1993), Shaw (2003), Chang and Fang (2006)). In this point of view, the information disclosure of a company is not only satisfaction of law and investors expectation, but also a build-up of confidence to this company. And the company which the investors like to support is much easier to raise the fund and more effective in performance Wallace *et* a/., (1994) discussed the correlation between capital scale and information transparency and found they are positively interrelated, that means, the more transparent the information is, and the lower the capital cost is. Li (2005) study testified that the company in financial distress might have diminished information disclosure previously to lower its transparency.

## 3. RESEARCH DESIGN

**3.1 Research Sample and Data Resource:** The research objects in this article are the listed electronics companies in the market: from them we discuss the relationship between information disclosure and financial distress. We analyze the annual financial ratio during 2005 and 2008.

**3.2 Financial Statement Ratio Data:** Considering convenience and reliability of investors' requirement of financial data, we adopt mainly financial ratio of companies listed on public prints of SFB, including 5 phases and 21 financial ratios. They are listed in Table 1.

**Table 1**
**Financial Statement Ratios**

| Category | Code | Financial Variables | Definition of Financial Variables |
|---|---|---|---|
| Financial Structure | R 1 | Shareholders, Equity to Total Assets ratio (%) | Total Shareholders' Equity Total Assets |
| | R 2 | Debt to Total Assets Ratio (%) | Total Liabilities/Total Assets |
| | R 3 | Permanent Capital to Fixed Assets Ratio (%) | (Shareholders' Equity + Long Debt) Fixed Assets |
| Liquidity Ability | R 4 | Current (%) | Current Assets/Current Liabilities Cash ÷ Cash Equivalents ÷ Marketable. |
| | R 5 | Acid-Test Ratio (%) | Securities – Accounts Receivable / Current Liabilities |
| | R 6 | Times Interest Earned | Interest before Income Taxes and Interest Expense / Interest expense |
| Asset | R 7 | Accounts Receivable Turnover | Sales Average Accounts Receivable |
| Utilization Ability | R 8 | Collection period | 360/Accounts Receivable Turnover |
| | R 9 | Sale Inventory Turnover | Operation Cost/Average Sale Inventory |
| | R 10 | Fixed Asset Turnover | 360/Sale Inventory Turnover |
| | R 11 | Fixed Asset Turnover | Sales/Average Fixed Assets |
| | R 12 | Total Asset Turnover | Sales/Average Total Assets |
| Profit Ability | R 13 | Return on Asset (%) | Net Income + Interest Expense (I-Tax Rate) Average Total Assets |
| | R 14 | Return on Common Equity (%) | Net Income / Average Shareholders Equity |
| | R 15 | Operate Profit to Capital (%) | Operation Income /Capital |
| | R 16 | Pre-tax Profit to Capital (%) | Pretax Income Capital |
| Profit Ability | R 17 | Net Profitability Ratio (%) | After – Tax profit / Operation Revenue |
| | R 18 | Earning Per Share | (After – Tax Income – Preferred Dividends)/ the Weight Numbers of Stock |
| Cash Flow | R 19 | Cash Flow Ratio (%) | Net Cash Flow from Operational Current Liabilities |
| | R 20 | Cash Flow Adequacy Ratio (%) | Net Cash Flow from Operation (five years recently) / Capital Expenditure + Increasing Amount of Sale cash Dividend (five years recently). |
| | R 21 | Cash Reinvestment ratio (%) | Net Cash Flow from Operation – Cash Dividend) / (Fixed Asset + Long-term Investment + other Assets + Working Capital). |

**3.3 Research Method:** ***3.3.1 Correlation Analysis:*** This interrelated analysis is to probe the linear relation between two random variables. For preventing various variables of financial ratio of the same phase from initiating multiple collinear, we make an advanced probation of correlated analysis into every phase of variable of financial ratio. We pick up the financial variables of

interrelated coefficient absolute value above 0.7 by related matrix and delete the less significant ones in the discrepancy analysis.

***3.3.2 Logistic Regression Analysis:*** The dependent variables are decided according to the enterprise financial management. They are divided into normal and crisis phases, which are why we adopt binary logistic regression model to analyze revelation between enterprise information and financial distress. Given below are binary logistic regression models formula 1 and formula 2 (Agresti, 1996):

$\text{Log}\,(\pi/\pi) = \alpha + \beta l + \sum^{k}_{i} = {}_{l}Y_{i}R_{i}$…….....(1)

*nj* = incidence j phase J = I

*j = 0* (crisis phase)

j = (normal phase)

*a* = constant term

*Yi* = the i-th coefficient of financial ratio. / =1, 2,....,K

$\beta$ = coefficient of fictitious variable

I= fictitious variable of information disclosure,

I = 0 (revealed), /= 1 (concealed)

$R_I$ = the i-th financial ratio, i = 1,2,....,K

$\text{Log}\,(\pi j/\pi j) = \alpha + \sum^{k}_{i} = {}_{l}\beta_{i}R_{i}$……...(2)

$\pi j$ = information revealed. *J* = 1

*j* = 0 (information concealed)

*j= I* (information revealed)

*a* = constant term

$\beta_i$ = coefficient of the i-th financial ratio. I = 1,2,...., K

*Ri* = the i-th financial ratio, I = 1,2. .....K

**3.4 Research Restrictions:** The only objects in this research are the listed electronics companies in Taiwan market not including other industries. They are far different from each other.

## 4. RESULTS

**4.1 Detecting Financial Ratios:** We analyze significantly different variables of financial ratio, and then sift the financial variables of most discrimination to be the ones of binary logistic regression analysis. Preventing the same phase of variables of financial ratio to initiate multiple co-linear, we previously analyzed the various phases of variables of financial ratio. We pick up the financial variables of interrelated coefficient absolute value above 0.7 by related matrix and delete the less significant one in discrepancy analysis. After the analysis, we sift five variables, such as, shareholders' equity to total assets ratio (Rl), acid-test ratio (R5), sale inventory turnover (R9), pre-tax profit to capital (R16), and cash flow ratio (R19), to precede the binary logistic regression analysis of the financial variables of normal and crisis companies.

**4.2 Interrelated Analysis between Information disclosure and Financial distress:** We pick up five variables of financial ratio and choose information disclosure to be independent variable. By means of binary logistic regression models we analyze the relationship between information disclosure and financial distress. Before examining binary logistic model, we have to prove that the independent variable can explain something for the dependent variables, that is, in the mode chi-square $x^2$ the statistic p-value 0.000 means the former can significantly explain for the latter. The result is that the significant financial ratios are information disclosure (I), shareholders' equity to total assets ratio (Rl), pre-tax profit to capita! (R16) and cash flow ratio (R19).

**Table 2**
**Logistic Regression Model Test of Information Disclosure and Financial Distress**

| **Management Phase** | **Variable** | **Parameter Assessment value** | **P – Value** |
|---|---|---|---|
| Normal vs. Crisis | Intercept | 1.403 | 0.178 |
| | Information disclosure (1) | -0.196 | 0.000* |
| | Shareholders' Equity to Total Assets Ratio (RI) | -0.172 | 0.004* |
| | Acid-Test Ratio (R5) | -0.017 | 0.329 |
| | Sale Inventory Turnover (R9) | 0.091 | 0.076 |
| | Pre-tax profit to Capital (R16) | -0.204 | 0.000* |
| | Cash Flow ratio (R19) | -0.135 | 0.013* |

Note: *P<0.05 **p <0.01 ***p <0.001

**Table 3**
Test for Comparative Crisis Ratio of Information Disclosure and Financial Distress

| **Management Phase** | **Variable** | **Index** | **Risk Multiple** |
|---|---|---|---|
| Normal Vs Crisis | 1 | $e^{-0.196}$ | 0.822 |
| | R1 | $e^{-0.172}$ | 0.842 |
| | R16 | $e^{-0.204}$ | 0.815 |
| | R19 | $e^{-0.135}$ | 0.874 |

From the above table 3 the results shows that information disclosure plus 1%, the management financial distress decreases to 0.822 ($e^{-0.196}$) multiple, that means the more information the enterprise discloses, the less risk it takes and the better the management condition will be. This result is the same as Li (2005). While RI plus 1%, the management crisis decreases to 0.842 ($e^{-0.172}$) multiple, that means the more Ratio of equity over assets is, the less risky the financial condition of the enterprise is. While R16 plus 1%, the financial distress decreases to 0.815 ($e^{-0.204}$) multiple, means the more the ratio of net profit before taxes over real capital is, the better the financial condition of the enterprise is. While R19 plus 1%, the management crisis decreases to

0.874 ($e^{-0.135}$) multiple, which means the more the ratio of cash flow is, the less risky the financial condition of the enterprise is and the better the operating condition will be.

**4.3 Analysis of Financial Ratio on Information disclosure:** According to Table 3, above shows that financial distress is significantly affected by information disclosure. This chapter is to explore which financial ratios will be significantly affected when the dependent variable is information disclosure. We designate RI, R5. R9, R16 and R19 as independent variables, and probe how financial ratios affect information disclosure by binary logistic regression model. Before the proceeding of binary logistic regression, we need to make sure the independent variables are explainable to the dependent one. We take an examination on it by $X^2$(chi-square). In the model P value is 0.000 that means the independent variables are explainable to the dependent one. From Table 4 it was observed that R16 and R19 are below 5% that means there are significant differences among them.

**Table 4**
**Logistic Regression Model Test of Information Disclosure**

| **Information Disclosure** | **Variable** | **Parameter Assessment Value** | **P -Value** |
|---|---|---|---|
| Revealed vs. Concealed | Intercept | 1.912 | 0.097 |
| | R1 | -0.098 | 0.016 |
| | R5 | -0.015 | 0.402 |
| | R9 | -0.104 | 0.083 |
| | R16 | -0.317 | 0.000*** |
| | R19 | -0.151 | 0.008** |

Note: *P<0.05 **p <0.01 ***p <0.001

**Table5**
**Test for Comparative Crisis Ratio of Information Disclosure**

| **Management Phase** | **Variable** | **Index** | **Risk Multiple** |
|---|---|---|---|
| Concealed vs. Revealed | R16 | $e^{-0.317}$ | 0.728 |
| | R19 | $e^{-0.151}$ | 0.860 |

Table 5 above shows that while R16 plus 1%, the opening financial risk decreases to 0.728 ($e^{-0.317}$) multiple. While R19 plus 1%, the risk decreases to 0.860 ($e^{-0.151}$) multiple. The test indicated that the higher the values of R16 and R19 are, the better the operating financial condition is.

## 5. DISCUSSION AND SUMMARY

The worldwide financial tsunami emerged in the wake of Asian financial disaster, partly because of false financial condition report and bankruptcy of enterprises, but mainly because of the bad management. To improve the information disclosure and enterprise management, SFB started to evaluate the information disclosure of all listed companies in the market for the reference of investors in 2003. The purpose of this article is to probe the function of information disclosure on enterprise management and cut down the possibility of enterprise financial distress. The test results tell us that the level of information disclosure is significantly related to financial distress. When the former increases 1%, the latter decreases to 0.822 multiple, that is, the higher the level of information disclosure is, the less risky the enterprise financial condition is. Additionally, pre-tax profit to capital and cash flow ratio are significantly discriminative in the level of information disclosure.

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