THE ASSOCIATION BETWEEN ACCOUNTING INFORMATION DISCLOSURE AND STOCK PRICE

Hwei Cheng Wang, Alabama A&M University
Hsain-Jane Chang, National Taipei University

ABSTRACT

This study examines whether higher information disclosure firms have higher associations with accounting returns (EPS) and stock prices based on the Ohlson (1995) model. Survey results on information disclosure and transparency of Taiwan firms in 2004 were obtained from the Taiwan SEC. The results indicate that firms with high levels of information disclosure have a higher association between accounting earning and stock market price than firms with low levels of information disclosure. In addition, the results provide evidence that there is a positively significant relationship between book value and stock price as well as between earnings per share and stock price

JEL: G30, M41, M48, D82

INTRODUCTION

Earnings manipulation by Enron, WorldCom, and AOL Time Warner, has made market participants aware of fraudulent financial reporting. In addition, the Asia economic crisis of 1997 caused the world pay attention to executive officer fraud. Thus, worldwide regulating authorities proposed corporate governance and disclosure regulation to prevent a reoccurrence. The U.S. government set up Sarbanes-Oxley Act of 2002 (SOX) in order to reinforce investment confidence and protect investors by improving the accuracy and reliability of corporate disclosure. The Sarbanes-Oxley Act is the public company accounting reform and investor protection act with the goal of preventing business failures and fraudulent financial reporting.

In contrast, the Taiwan government proposed two methods to enhance corporate governance. First, it proposed to establish an independent board system to enhance the policy and procedures of corporate legitimacy and rationality. Second, it authorizes Securities and Future Bureau (SFB) to initiate an information disclosure and transparency ranking system to ensure corporations provide full and accurate information disclosure.

This study utilized SFB information disclosures and the system of transparency ranking as a proxy variable for information transparency to examine whether the high information disclosure firms have higher associations with accounting earnings (EPS) and stock prices then low information disclosure firms. Firms on the Taiwan OTC market were divided into two groups utilizing the Ohlson model. One group of firms is classified as higher information transparency firms and another group of firms is a lower information transparency group. This classification allows us to examine whether the firms with high level(good) of information disclosure have a higher association between accounting earnings (EPS) and stock market price than firms with low level (bad) of information disclosure.

The remainder of the paper is organized as follows. In the next section, we discuss the relevant literature and develop the test hypotheses. Next, we discuss the methodology used in the empirical examination. A discussion of the data and test results follows. Finally, the paper closes with some concluding comments.

LITERATURE AND HYPOTHESIS DEVELOPMENT

Collins, Maydew and Weiss (1997) investigated systematic changes in the value-relevance of earnings and book values over time. The sample was selected form the period 1953-1993. They investigated the value-relevance of earnings and book values over time using a valuation framework provided by Ohlson (1995), which expressed price as a function of both earnings and book value of equity. They estimated yearly cross-sectional regressions for a 41-year period spanning 1953 to 1993 and use R^2 as the primary metric to measure value-relevance. Then, they used a technique described in Theil (1971) and applied by Easton (1985) in order to compare the explanatory power that earnings and book value had over prices. They decomposed the combined explanatory power of earnings and book values into three components: (1) the incremental explanatory power of earnings, (2) the incremental explanatory power of book values, and (3) the explanatory power common to both earnings and book values. The results showed that the value-relevance of "bottom line" earnings has declined over time, having been replaced by an increased value-relevance of book value.

Verrecchia (1983 and 1990) found that increasing information disclosure results in increase costs, when the stock price of firm was understated. In order to reduce the information asymmetry between managers and outside investors, managers would like to increase the information disclosure to increase the stock price. Hearly and Palepu (1993) assumed that there was an information asymmetry between managers and outside investors. They posited that if there was divergence in owners' and manager's objectives, managers would make financial reporting decisions in their own interest, in which case financial disclosures might not be reliable.

Skinner (1994) pointed out that when firm value is overstated, mangers would disclose bad information to reduce the cost of a lawsuit. The disclosure of bad information is more reliable then the disclosure of good information and can reduce lawsuit costs. Skinner found that the firms might increase information transparency to improve the firm value and solve agency problems.

When the transaction cost is higher, the investors who have inside information are likely to use the information to earn an abnormal return (Copeland and Galai (1983), Glosten, Millgrom (1985) and Diamond (1985)). In order to prevent investors from using inside information to make profits and protect investors' benefits, managers will disclose information to investors. Thus under this model, managers have incentives to disclosure the good and bad news. These results suggest that if a firm value is understated or overstated, managers would increase the information transparency to reflect the reasonable firm value. Thus, this study posits that when transparency of information disclosure increases the value of accounting information increases, thus external investor can accurately assess the firm value.

Ohlson (1995) developed and analyzed a model of a firm's market value as it relates to contemporaneous and future earnings, book values, and dividends. Ohlson (1995) found that equity accounting provide the underpinnings of the model. The clean surplus relationship applies, and dividends reduce current book value but do not affect current earnings. Ohlson's model satisfied many appealing properties, and it provided a useful benchmark when one conceptualizes how market value relates to accounting data and earnings, book value, and dividends. Thus, based on Ohlson's model we argue that market price is associated with accounting earning and book value. Therefore, from Ohlson (1995) model and the above literature reviews we posit that:

Hypothesis 1: Firms with high levels (good) of information disclosure have a higher association between accounting earning (EPS) and stock market price than the firms with low levels (bad) of information disclosure

METHODOLOGY

Measurement

This study utilized Ohlson's (1995) model as the research basis, employed the SFB (Securities and Future Bureau) information disclosure and transparency ranking system and used public firms or OTC firms as the nonaccounting information to form the research model of this study as follows:

$$P_i = C + \beta_1 PERBV_i + \beta_2 EPS_i + \beta_3 DIS_i + \beta_4 TYPE_i + \beta_5 DIS_i * PERBV_i + \beta_6 DIS_i * EPS_i + \varepsilon_i \quad (1)$$

Where:

P_i is the market value, or price, of i firm's equity

$PERBV_i$: book value for firm i

EPS_i: earning per share for firm i

DIS_i: disclosure level for firm i

Dis = 1 presents for one third of sample firms are in the high level of disclosure group.
Dis = 0 presents for two third of sample firms are in the low level of disclosure group.

$TYPE_i$: TYPE=1 presents for Taiwan Security Exchange (TSE) and TYPE=0 presents for Taiwan OTC market (OTC)

$DIS_i * PERBV_i$ ：disclosure level interaction with book value for firm i

$DIS_i * EPS_i$ ：disclosure level interaction with earning per share o for firm i

ε_i ：the residual term for firm i

The sample was divided into two groups, one group with high level of disclosure and second group with low level of disclosure based on our survey questions. One-third of sample firms are in the high level of disclosure group, and the remaining two third of sample firms are in the low level of disclosure group. This study focuses on the disclosure level interaction with earnings per share and book value on i firm. Disclosure level interaction with earning per share presents the difference in the explanation power between high disclosure level of earnings and low disclosure level of earnings on i firm. This study examines whether earnings per share and book value of the high disclosure level firms can explain abnormal returns by testing the disclosure level interaction with earning per share and book value. If the results show a positively significant difference, it indicates that high disclosure level firms have higher EPS and book value than low disclosure level firms. This implies that the accounting disclosure level does help decision makers and investors to make correct decisions.

Variables

We used one dependent variable and seven independent variables to test our hypotheses. The dependent variable is stock price, which is the closing price of the sample firms on 3/31/2004. Seven independent variables were incorporated into the regressions as follows:

Book value (PERBV): PERBV is the total asset/outstanding shares at the end of year. Ohlson Model (1995) develops and analyzes a model of a firm's market value as it relates to contemporaneous and future earnings, book values, and dividends. Therefore, we posit that the market value at the end of year is positive relative to book value.

Earnings per Share (EPS): EPS denotes (net income from continuing operation/ weighted average of outstanding shares)/ at the beginning of market price.

Disclosure level (DIS): The Sample was divided by 2 sample groups, one group with high level of disclosure and second group with low level of disclosure based on our survey questions. One third of sample firms are in the high level of disclosure group, and the remaining two third of sample firms are in the low level of disclosure group. Dis equal 1 presents for one third of sample firms are in the high level of disclosure group. Dis equal 0 presents for two third of sample firms are in the low level of disclosure group.

TYPE: TYPE=1 presents for Taiwan Security Exchange (TSE), TYPE=0 presents for Taiwan OTC market (OTC)

$DIS_i * PERBV_i$: Disclosure level interaction with book value.

$DIS_i * EPS_i$: Disclosure level interaction with earnings per share.

ε_{it} ：The residual term

Grand (1980) found that the annual earnings announcements of OTC firms appear to possess more information content than those of the NYSE firms. Grand pointed out that OTC investors apparently have fewer alternative sources from which to acquire information on firms prior to the release of the annual earnings number. Therefore, when the announcement is made, the market reaction to the information contained in the report may be significant. Grand assessed the differences in the information content of annual earnings announcements between a sample of OTC firms and a sample of NYSE firms. Since the stock market in Taiwan is similar to in U.S. We predict, in a similar fashion, that there is also a significant difference of earning coefficient between OTC firms and TSE firms in Taiwan.

SAMPLE AND DATA COLLECTION

To enhance corporate governance, the Taiwan government proposed two regulatory approaches. Taiwan government in 2004 authorizes the Securities and Future Bureau (SFB) to implement an information disclosure and transparency ranking system to ensure that corporations provide full and accurate disclosure. The system was designed by seven famous academic professors and industry experts. The purpose of the information disclosure and transparency ranking system is to increase information transparency and to help investors and decision makers. The evaluation indicators of this system are based on voluntary and mandatory disclosures. The evaluation indicator classified five major evaluators based on 88 questions. The survey questions were designed to require either a yes or no response. This study employed SFB information disclosure and transparency ranking system results as a proxy variable for information transparency.

In 2004, there were 611 public firms on the Taiwan Security Exchange (TSE) and 308 sample of firms on OTC. The government required all of public firms in TSE and OTC to be SFB evaluated with a few exceptions including the following: non-TSE Firms, OTC over one year due to information is insufficiency and firms that change from one stock exchange to the other. The sample group included 205 high disclosure firms from the TSE market and 97 high disclosure firms from the OTC. Since this study needs to calculate the beta coefficient as the control variable, it needs at least 24 months in the

estimation period. The final sample included 662 firms. We classified the sample into two groups, one group is high disclosure firms with one third of total sample and another group as low disclosure firms two third of the total sample. Table 1 show frequency statistics for our sample.

Table 1: the Distribution of Sample Firms

	High Disclosure Level	**Low Disclosure Level**	**Subtotal**
OTC Market	39	117	156
TSE market	163	343	506
Total	**202**	**460**	**662**

This table shows frequency statistics for the sample.

Table 2 shows the distribution of sample firms by industry and disclosure level. The first column indicates the number of firms. The second column indicates the percentage of the total sample represented by each group.

ANALYSIS AND PRESENTATION OF FINDING

Descriptive Statistics

Table 3 presents the descriptive statistics for the sample. Table 3 presents the mean, median, minimum, maximum, and standard deviation for the dependent variables and independent variables, which include PRICE, PERBV, EPS, DIS, and TYPE. Mean and median of PRICE during the period 1993 are $18.75525 and 13.95 respectively. Mean and median of PERBV during the period 1993 are $13.5029 and 13.0454 respectively. Mean and median of EPS during the period 1993 are $0.834268 and 0.72 respectively. Mean of DIS during the period 1993 is $0.305085. Mean of TYPE during the period 1993 is $0.762712.

Examining the Existence of Multicollinearity

Multicollinearity between independent variables causes large variances and covariance for the estimators of the regression coefficients, which makes difficult to distinguish their relative influences. This problem was tested by deriving the correlation coefficient matrix. Table 4 shows the results. The correlations between variables were computed by using Pearson Correlation Coefficients. The correlation matrix in Table 4 shows that the strongest correlation coefficient was 0.758 between firm PRICE and EPS. The second highest correlation coefficient was 0.747 between firm PRICE and PERBV. Gujarati (1988) suggests that simple correlations between independent variables should not be considered "harmful" unless they exceed 0.80 or 0.90. The Pearson correlation coefficient (reported in Table 4) suggests that multicollinearity is not severe for the independent variables in this study.

Table 2: Frequency Statistics for Sample Company Industry Distribution

	Low Disclosure Level		High Disclosure level		Disclosure level ratio	subtotal
Industry	**No(a)**	**Percentage**	**No(b)**	**Percentage**		
chemical	29	4.38%	10	1.51%	25.64%	39
cement	5	0.76%	3	0.45%	37.50%	8
retail and	10	1.51%	3	0.45%	23.08%	13
other	41	6.19%	8	1.21%	16.33%	49
Glass	5	0.76%	1	0.15%	16.67%	6
food	15	2.27%	9	1.36%	37.50%	24
textile	39	5.89%	15	2.27%	27.78%	54
paper	5	0.76%	2	0.30%	28.57%	7
Plastic	10	1.51%	15	2.27%	60.00%	25
computer	158	23.87%	106	16.01%	40.15%	264
transportation	17	2.57%	3	0.45%	15.00%	20
transportation	2	0.30%	2	0.30%	50.00%	4
cable	14	2.11%	1	0.15%	6.67%	15
commodity	1	0.15%	0	0.00%	0.00%	1
Plastic tire	5	0.76%	4	0.60%	44.44%	9
Electric	28	4.23%	7	1.06%	20.00%	35
steel	22	3.32%	7	1.06%	24.14%	29
construction	45	6.80%	6	0.91%	11.76%	51
entertainment	9	1.36%	0	0.00%	0.00%	9
Total	460	69.49%	202	30.51%	30.51%	662

This table shows the frequency statistics. The high disclosure industries include plastic (60%), transportation tool (50%) and plastic tire (44.44%); the low disclosure industries included entertainment (0%), commodity (0%) and cable (6.67%)

Table 3 Descriptive Statistics

Variable	**Mean**	**Median**	**Maximum**	**Minimum**	**Standard Deviation**
Dependent Variables					
PRICE	18.75525	13.95	199.41	0.37	16.81407
Independent Variables					
PERBV	13.5029	13.0454	47.7717	-10.9874	5.645713
EPS	0.834268	0.72	12.78	-7.34	2.075047
DIS	0.305085	0	1	0	0.460798
TYPE	0.762712	1	1	0	0.425748

P_i : the market value, or price, of the i firm's equity, DIS: disclosure level,1 presents for one third of sample firms are in the high level of disclosure group; 0 presents for two third of sample firms are in the low level of disclosure group. TYPE: 1: public company TSE; 0: OTC ; PERBV: book value per share; EPS: earnings per share

Table 4 : Pearson Corrélation Coefficient Matrix

Variables	**PRICE**	**PERBV**	**DIS**	**TYPE**	**EPS**
PERBV	0.747**				
DIS	0.219**	0.267**			
TYPE	0.144**	0.192**	0.071		
EPS	0.758**	0.736**	0.196**	0.159**	

**, and ** indicate correlation is significant at the 0.05 and .01 level (2-tailed) respectively.*

Analysis of Regression Effects

To test our predictions, we use one-year cross-sectional differences in disclosure levels. From the Ohlson model regression, we find that the full model explanatory power is 73.55% and the F value is 226.7409, indicating that the model has very good explanatory power. Table 5 shows the results of the regression model used in this study. The book value (PERBV) analysis (β=0.8121, t= 3.4123, p<.001) shows that stock price is positively and significantly associated with book value. The disclosure level interaction with book value (DIS*PERBV) analysis (β =-0.1002, t = -0.2991, p>0.1) shows that disclosure level interaction with book value is negatively and insignificantly associated with stock price.

Table 5: Results of Regression Equations Model

Variable	Predict Sign	Coefficient	Standard Deviation	T Value[b]
C		1.3849	2.6887	0.5150
PERBV	+	0.8121***	0.2379	3.4123
DIS*PERBV	+	-0.1002	0.3351	-0.2991
EPS	+	6.8162***	0.19116	7.4767
DIS*EPS	+	4.1537**	1.9422	2.1385
DIS	-	-5.9702	5.8887	-1.0138
TYPE	-	-0.6864	1.2690	-0.5409
R-squared				0.78792
Adjusted R-squared				0.735534
F-statistic				226.7409
Prob(F-statistic)				0

[a]n = 662, [b] Beta weights and -values reflect results for the full model ;When the predicted sign is either (+) or (-), then the value is a one-tailed test; when the predicted sign is (?), then the value is from a two-tailed test. p_i : the market value, or price, of the i firm's equity DIS: disclosure level,1 presents for one third of sample firms are in the high level of disclosure group; 0 presents for two third of sample firms are in the low level of disclosure group. TYPE: 1: public company in TSE; 0: OTC ; PERBV: book value per share; EPS: earnings per share.

The earnings per share (EPS) analysis (β =6.8162, t = 7.4767, p<.001) shows that earning per share is positively and significantly associated with stock price. The results of the interaction term (DIS*EPS) involve both disclosure level and earnings per share (β =4.1537, t = 2.1385, p<.01), which is found to be positively significant. Thus, the results support the hypothesis that disclosure level positively moderates the relationship between earnings per share and stock price. The fact that disclosure level interaction with earning per share is positively associated with stock price suggests that investors need to be particularly concerned about firms with higher disclosure levels. This situation produces interaction effects that increase earnings per share and increase the explanatory power of the stock price. The disclosure level (DIS) analysis (β =-5.9702, t = -1.0138, p>0.01) demonstrated that disclosure level is negatively and insignificantly associated with stock price. The (TYPE) analysis (β =-0.6864, t = -0.5409, p>.01) shows that type is negatively and insignificantly associated with stock price. Thus, the results demonstrated that the stock exchange where the firm is listed does not result in a different stock price.

CONCLUSIONS

To enhance corporate governance the Taiwan government authorized the Securities and Future Bureau (SFB) to set up an information disclosure and transparency ranking system in 2004. We examine whether the higher information disclosure firms have a higher association with accounting earnings (EPS) and stock price based on the Ohlson model(1995) . The results indicate that the firms with a high level of information disclosure have a higher association between accounting earnings (EPS) and stock market price than the firms with low levels of information disclosure. In addition, the results indicate that there

is a positively significant relationship between book value and stock prices. Furthermore, we found that there is a positively significant association between earnings per share and stock price. We concluded that the firms that increase information disclosure transparency can increase accounting earnings; thereby, increasing stock market price.

The paper is subject to one primary limitation. That is, the SFB data does not disclose a firms score. Rather it provides a dummy variable indicating a disclosure classification. Had the data included the company score, additional information could be gleaned from the analysis. Future research can extend the analysis of the SFB data for longer periods of time to make the results more generalizeable. Future researchers might also test the relationship between information disclosure and earnings management.

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