THE EFFECTS OF BOARD CHARACTERISTICS ON EARNINGS MANAGEMENT

Lanfeng Kao[*], *Anlin Chen*[*]

Abstract

This paper examines the relationship between board characteristics and earnings management. Management of a firm may engage in earnings management for his own benefit. However, under proper corporate governance mechanism, the board of directors might be able to monitor the firm and prevent the management from engaging in earnings management. We find that when the board size is large, the higher the extent of earnings management. However, when there are more outside directors in the board, the extent of earnings management is lower. The effects of board characteristics on earnings management are significant only for group affiliation firms or non-electronic firms.

Keywords: corporate governance; ownership; earnings management; board of directors

1. Introduction

Enron went bankrupt in 2001. Enron's bankruptcy is the most serious bankruptcy case in the US and hurts the US capital market and financial market dramatically. Beside Enron, there still are a few scandals in financial statement fraud and earnings manipulation, such as Xerox and World.com overstating sales and profitability. These cases in accounting scandals provide evidence of artificial earnings management. In Taiwan, there are several financial distress cases during Asian financial crisis in 1997. These financial distress cases result from poor operations and from lack of corporate governance on the behaviors of the management or controlling shareholders. Even though the board of directors is designed to monitor the management, it is evidenced that management or the controlling shareholders engage in earnings management and announce false financial reporting to cover their transferring wealth from the minority shareholders to themselves. Corporate governance is thus urged to facilitate a solid capital market.

Fama and Jensen (1983) indicate that the board of director is the core of corporate governance and that the structure of board of directors is influential to the functions of the board. They argue that outside directors are more efficient in monitoring the management and will not collude with the management.

Therefore, under the separation of ownership and control, outside directors facilitate the governance functions of the board.

Most of previous studies related to the functions of the board focus on the relationship between firm performance and the characteristics of the board. Lee et al. (1992) point out that stockholders' wealth increases in management buyouts when outside directors are in charge. Kosnik (1987, 1999) shows that outside directors reject the proposal of greenmail against on takeover. Brickley and James (1987) find that CEO compensation is negatively related to the number of outside directors, while Weisbach (1988) finds that CEOs are more likely to quit due to poor performance when faced with outside directors. Previous studies argue that an efficient board of directors can reduce the agency costs significantly. Beasley (1996) also shows the likelihood of financial statement fraud is reduced because of the existence of outside directors and audit committee.

The financial distress cases in Taiwan can be attributed to poor corporate governance mechanism. As mentioned earlier, board of directors is the core of the corporate governance system, the composition and characteristics of board influence the monitoring functions of board and the wealth of stockholders. So

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far, little research ever investigates the effect of board characteristics on financial statement fraud and on earnings management in Taiwan. Therefore, this paper focuses on this issue to provide more evidence about the relationship between earnings management and the board characteristics, especially in group-affiliation firms and in non-electronic firms. Group-affiliation firms encounter more severe agency problem due to less transparency of transactions, while non-electronic firms have lower percentage of foreign institutional ownership and thus have higher agency cost.

The remaining of the paper is organized as follows. Section II reviews related literature. Section III describes our empirical design. Empirical results are reported in section IV. Finally, section V concludes.

2. Literature Review

2.1. Earnings management

Healy (1985), Guidry et al. (1999), Holthausen et al. (1995), Sweeney (1994), and Defond and Jiambalvo (1994) adopt the view of contractual motivation that earnings management can be regarded as an opportunistic behavior to maximize personal utilities under compensation and debt covenant. Perry and Willians, (1994), Friedman (1994), Erickson and Wang (1999) and Toeh et al. (1998) stand for the argument of stock price motivation that managers engaged in earning management in order to mislead the market.

More specifically, Healy (1985) examines how bonus schemes affect the choices of accounting policy. He argues that the managers tend to maximize their bonuses through opportunistic earnings management. When earnings fall within an expected range, managers will choose accounting policies to raise the reported earnings up to the upper bound stipulated by the covenant to maximize their bonuses. However, when earnings are above the upper bound or below the under bound, managers tend to choose accounting policies that could defer earnings into the future to maximize their bonus in the long run. The interesting finding is that managers would choose accounting policies to reduce earnings when they find that the reported income is still unable to reach the lower bound required for bonus even if they adopt the aggressive accounting standards. This strategy would eventually defer the current income into the future, which in turn would allow them to make less effort to receive bonus in the coming years. This finding is contrary to previous studies that suggest managers monotonously choose accounting policies to increase reported earnings, and has been referred to the so called "big bath theory" since then.

Guidry et al. (1999) extend their study to investigate the opportunistic behavior of business-unit managers. The empirical results are congruent to the arguments of Healy (1985). Holthausen et al. (1995) also find that managers who are at their maximum bonus would manipulate accruals to lower reported earnings, which is congruous to Healy (1985). However, there is no sufficient evidence that managers would "take a bath" as suggested by Healy (1985). It seems that managers have been more concerned with the uncertain consequences of reporting their lackluster performance to the board of directors. The employment of conservative accounting standards to further decrease income under the circumstances of being unable to reach the lower bound of receiving bonus might not be the optimal strategy in terms of opportunistic behavior. In addition to those compensation covenant literature, Sweeney (1994) finds that debt covenant defaulting firms tend to voluntarily change their accounting policies or adopt new accounting standards that will increase reported income. Similarly, Defond and Jiambalvo (1994) find that defaulting firms tend to raise their income through discretionary accruals. In sum, these studies are congruous to the notation that managers would manipulate account income as an opportunistic behavior to maximize their own utilities under compensation or debt covenant.

Another interesting issue that both researchers and practitioners have entangled themselves with for decades is: Can the market be misled by firms that engaged in earnings management? To answer this question, Perry and Williams (1994) investigate how managers would manipulate earnings to inflate stock prices throughout the deal of management buyouts. Friedman (1994) investigates whether management manipulated accounting earnings to increase stock prices during initial public offerings. Erickson and Wang (1999) investigate the earnings management behavior of stock-for-stock mergers. Toeh et al. (1998) investigate the impact of earnings management on seasoned equity offerings. These studies conclude that investors are unable to distinguish the quality of earnings inherent from alternative accounting standards. The economic performances of the firms that engage in earnings management are overstated and their stock prices are inflated.

2.2. The conflict between controlling shareholders and outside shareholders

Contrary to the separation of ownership and control which argues that the agency cost of conflict between shareholders and managers, the existence of controlling shareholders implies the agency cost of conflicts between controlling shareholders and outside shareholders (Shleifer and Vishny, 1986; Shleifer and Vishny, 1997; Morck et al., 1988; and La Porta et al., 2000). La Porta et al. (1999) examine the major economies in the world and find that most of the firms in the world are controlled by families except for the firms in the U.S. The controlling shareholders or controlling families gain control through pyramidal structures and own more control right than cash flow right. The deviation of control right and cash flow right induces the controlling

shareholders to expropriate the outside shareholders. Shleifer and Vishny (1997) show that under pyramidal structures, management would abscond cash of the firm and that management would expropriate the outside shareholders not only through free cash flow but also through transfer pricing system. Management would establish an independent firm under his own name and sell products at lower prices to the independent firm. In Taiwan, Lee (2001) also finds that the higher the extent of deviation of control right and cash flow right, the higher the incentive the controlling shareholders to expropriate outside shareholders and the higher the frequencies of stock transactions, non-operations income and non-operations sales among the controlling shareholders and their relative parties.

Yeh and Lee (2001) point out that 76% of the listed firms are controlled by family shareholders and 66.45% of the boards of the listed firms are totally controlled by family shareholders. For the research related to the economy of controlling shareholders in Taiwan, most of the research focuses on how shares collateralized by directors influences the firm performance or firm value. Previous studies argue that the ownership of board of directors, proportion of shares collateralized, duality of chairman, the controlling family, size of board and the ownership of controlling family are influential to value of the firms. Typically, firm performance is measured by accounting indices or Tobin's Q. We can look role of directors from two different perspectives: monitoring and expropriation. Previous studies examine the governance role of the board of directors and support the effectiveness of board of directors on monitoring the manager. Nevertheless, when the board of directors control over the managers, managers will act from the angle of the directors' interest rather than outside shareholders' interest. Hence, we should take into account the possible expropriation from directors over the minority shareholders. Previous studies focus on the governance role of the board of directors and support the effectiveness of directors' monitoring on the managers. Fama (1980) and Williamson (1988) show that the structure of board is influential to functions of governance. In Taiwan, there exist controlling shareholders (or families) in most of the firms and most of the boards are controlled by shareholders of a family (Yeh and Lee, 2001). Hence, we doubt whether the board can monitor the management efficiently. We argue that outside directors play a more important role in monitoring the firms in Taiwan. In Taiwan, the board does not efficiently monitor the firms. The worse case is that the board creates another source of agency problems when the board is controlled by families. During the period of 1998 and 1999, a lot of firms experience financial distress; part of the causes of financial distress can be attributed to the Asia financial crisis. Part of the causes of financial distress can be attributed to the expropriation from the board. For example, the boards of Tung Lung Metal Industrial

Co. and Ban Yu Paper Mill Co., Ltd. sell the assets of the firms to some others with extremely low prices. The controlling shareholders of Victor Taichung Machinery Works Co., Ltd. and Chinese Automobile Co., Ltd. use the capitals of the firms to support the stock price leading to big losses of the firms.

3. Empirical Design

3.1. Hypotheses development

Fama and Jensen (1983) indicate that the most important function of board is to alleviate the agency cost resulting from the separation of ownership and control. The larger the size of the board, the lower the monitoring from the board. When the board size is larger, it is more difficult for the board members to communicate efficiently with one another. Hence, function of board is weaker when there are more members in the board. Jensen (1993) argues that the management is more likely to engage in earnings management when the board is weak. Dechow et al. (1996) also find that board size is larger for the firms engaging in earnings management than for those not engaging in earnings management. Furthermore, Fuerst and Kang (2000) also show that board size is negatively related to the firm value. Therefore, our first hypothesis is:

Hypothesis 1: The larger the board size, the higher extent of earnings management.

For self-interest, the higher the ownership of the board, the more powerful the monitoring from the board. Hence, the ownership of board can reduce the agency problems between the management and the stockholders. When the board ownership is high, the wealth of the board members is linked to the firm value. Hence, the board will watch the management closely and thus earnings management is not severe. Therefore, we hypothesize that

Hypothesis 2: The higher the ownership of the board, the lower the extent of earnings management.

Fama (1980), Fama and Jensen (1983), Williamson (1983) and Morck, Shleifer and Vishny (1988) argue the function of board is dependent on the composition of the board. The inside directors who are also managers will be able to receive more information about the firm to monitor the management. However, inside directors are more likely to co-op with the management to expropriate the outside shareholders. On the other hand, outside directors are independent of the management and thus can monitor the management more efficiently (Fama, 1980, and Fama and Jensen, 1983). Beasley (1996) also finds that the possibility of financial fraud is lower when there exist outside directors in the board. Therefore, we argue that the outside directors raise the monitoring

function of the board and propose the following hypothesis:

Hypothesis 3: The more outside directors, the lower the extent of earnings management.

When the outside directors own more shares, they are more linked to the value of the firm and will devote more time in monitoring the management. Therefore, we also hypothesize that

Hypothesis 4: The higher the ownership of outside directors, the lower the extent of earnings management.

Further, group affiliation becomes the major business style of corporations in Taiwan recently. Firms tend to diversity to reduce risk and enlarge business. However, the transfer of funds within the group is less transparent. Therefore, the relation between earnings management and board characteristics is more significant in group affiliation firms than in non-group affiliation firms.

Hypothesis 5: The relationship between earnings management and board characteristics is more significant in group affiliation firms than in non-group affiliation firms.

Electronic industry is a capital-intensive industry and needs a professional team to operate. Compared with other industries, electronic industry attracts more institutional investors. Institutional investors can reinforce the monitoring functions of the board and reduces the agency problem between the management and outside shareholders. Due to better outside monitoring mechanisms, the inside governance role of board is less significant. Therefore, we hypothesize that

Hypothesis 6: The relationship between earnings management and board characteristics is less significant than in non-electronic industry.

3.2. Variable Definition

1). The measurement of earnings management
This paper applies discretionary accruals (DA) as a measure of earnings management. This measure is suggested by Healy (1985), Jones (1991), Defond and Jimbalvo (1994), and Teoh et al. (1998). Accruals are the difference between net income and cash flow from operations. Accruals consist of discretionary and non-discretionary accruals. DA is the part of accruals that can be manipulated and is typically used as the measure of earnings management. Teoh et al. (1998) further argue that current accruals can measure earnings management more precisely. Therefore, we employ both discretionary total accruals (DTAC) and discretionary current accruals (DCA) to measure earnings management. DTAC and DCA are explicitly expressed in appendix.
(2). Characteristics of board of directors
    a. Board size: the number of members in the board.

    b. Ownership of board of directors: the ownership of the member in the board.
    c. Outside board size: the number of outside directors in the board.
    d. Ownership of outside director: the ownership of outside directors in the board.

(3). Other control variables
The duality of chairman is that the chairman of board is also the CEO of the firm. Under this scenario, the board will not be able to monitor the management objectively. That is, the duality hurts the objectivity of the board. Fama (1980) and Fama and Jensen (1983) emphasize the important of hierarchical decision. The lower hierarchy of decision is to implement the decision while the higher hierarchy is to set and monitor the implementation. Jensen (1993) suggests that CEO and chairman of board be separated to reinforce the function of the board. Dechow et al. (1996) points out that the duality of chairman raises the likelihood of earnings management.

There are cases of financial distress in 1998. The common phenomenon of those financial distress cases is that the managers and board of directors collateralize their shares to manipulate the stock prices. Faced with market crash, the board members or managers who collateralize their shares will be forced to deposit more money in meet the margin requirements. In avoid the rising margin requirements at bear markets, the managers tend to transfer the capital of the firm to prop up the share price. The Asian financial crisis in 1997 causes Taiwanese stock market to decline sharply leading to financial distress of the firms with stock collateralization of board members. Share collateralization by board members links the cash flow of the board members who collateralize their shares with the stock market price of the firm. When the stock price drops, the board members involved in management are more likely to engage in or force managers to engage in earnings management to support the stock price. Kao and Chiou (2002) show that share collateralization by board members reduces the linkage between accounting earnings numbers and stock returns. Therefore, we argue that share collateralization by board is influential to earnings management. Following Klein (2000), we include 3 other control variables: extreme earnings performance (the absolute change in the previous year's income divided by total assets), financial leverage (total debt divided by total assets) and political costs (log of beginning year's asset). In addition, Loebbecke et al. (1989) argue that rapid company growth is an indicator for financial statement fraud. If the company has been experiencing rapid growth, management may have motivation to misstate the financial statements during a downturn to give the appearance of stable growth.

    a. Shares collateralized by board of directors: the number of shares collateralized by the board divided by the number of shares owned by the board.

b. Shares collateralized by outside directors: the number of shares collateralized by outside directors divided by the number held by outside directors.

c. Duality of chairman: Chairman of board also serves as the CEO.

d. Debt ratio $= \dfrac{Total\ debt\ at\ the\ end\ of\ t}{Total\ asset\ at\ the\ end\ of\ t}$;

e. Firm size: the logarithm of equity capitalization (market value of equity) at the end of t;

f. Volatility of earnings $= \dfrac{Earnings\ at\ t - Earnings\ at\ t-1}{Asset\ at\ the\ end\ of\ t-1}$;

g. Tobin's Q
$$= \frac{Book\ value\ of\ debt + market\ value\ of\ equity}{Book\ value\ of\ total\ asset}$$

3.3. Data Source

We examine all listed firms in Taiwan stock exchange except for the firms in financial industry. Moreover, since we need to estimate DCA and DTAC from the firms in the same industry, any industry with less than 6 firms is deleted from the sample.

Finally, we reach 1097 observations for our sample. All the required variables are collected form TEJ (Taiwan Economic Journal). TEJ provides the data of stock returns and financial statement variables.

3.4. Empirical methodology

To examine the relationship between earnings management and the characteristics of board, we employ the following regression.

$$| \, EM \, | \; = \beta_0 + \beta_1 \, N1 + \beta_2 \, OUTOWN + \beta_3 \, N2 + \beta_4 \, OWNPCT + \beta_5 \, PLEDOWN +$$

$$\beta_6 \, OUTPLD + \beta_7 \, SAME + \beta_8 \, DE + \beta_9 \, LOGMV + \beta_{10} \, ECHANGE + \beta_{11} \, Q + \varepsilon_{it}$$

Where,
EM is measured by absolute value of DTAC or DCA,
N1 is the number of outside directors,
OWTOWN is the ownership of outside directors,
N2 is the number of board members,
OWNPCT is the ownership of board of directors,
PLEDOWN is the share collateralized by board members,
OUTPLD is the shares collateralized by outside directors,
SAME is the duality of chairman,
DE is the debt ratio,
LOGMV is the logarithm of equity capitalization,
ECHANGE is volatility of earnings,
Q is the Tobin's Q.

Since the dependent variables are absolute value of earnings management and are limited to be positive, OLS is not suitable for the regression. Rather than OLS, we estimate the parameters in the regression under the assumption of lognormal distribution (Klein, 2000).

4. Empirical results

4.1. Descriptive statistics

Table 1 reports the descriptive statistics of the variables. Table 1 shows that average absolute value of DCA is 0.10565, with minimum at 0.00004 and maximum at 1.10377. The average absolute value of DTAC is 0.10372, with minimum at 0.00006 and maximum at 1.09224. Totally speaking, DTAC and DCA skew to the right.

Table 1. Descriptive statistics

Variable[a]	N	mean	Standard deviation	minimum	maximum
| DCA |	1036	0.10565	0.19175	0.0000400	1.10377
| DTAC |	1036	0.10372	0.18615	0.0000600	1.09224
DE	1046	0.40536	0.15790	0.04948	0.84655
LOGMV	997	8.08848	1.44630	4.63470	14.20270
ECHANGE	1046	0.05148	0.06071	0.0000600	0.74935
Q	997	1.15458	0.76635	0.31330	10.63970
SAME	1046	0.28298	0.45066	0	1.00000
OWNPCT	1046	25.31139	14.39757	0.33000	97.13000
PLEDOWN	1042	19.21315	26.19881	0	100.00000
OUTOWN	1070	13.63379	13.72581	0	97.13000
OUTPLD	1070	0.17330	0.27868	0	1.00000

Table 1 continued

N1	1070	4.71402	2.53958	1.00000	17.00000
N2	1081	7.45051	3.51763	2.00000	27.00000

[a]Variable definition:

| DCA | = |DCA estimated from cross-sectional Jones model|; DTAC | = |DTAC estimated from cross-sectional Jones model|; DE = debt ratio; LOGMV = logarithm of equity market value; ECHANGE = volatility of earnings; Q = Tobin's Q; SAME = duality of chairman; OWNPCT = ownership of board of directors; PLEDOWN = proportion of shares collateralized by board of directors; OUTOWN = ownership of outside directors; OUTPLD = proportion of shares collateralized by outside directors; N1 = number of outside directors; N2 = number of board members.

The average ownership of board is 25.3119% while the average proportion of shares collateralized by board is 19.21315%. That is, about one-fifth of the shares owned by the board members are collateralized. On the other hand, the average ownership of outside directors is 13.63% and only 0.173% of shares owned by outside directors are collateralized. Therefore, we find that it is very popular for the inside board members to collateralize their shares in Taiwan.

Table 2. Correlation analysis

	| DCA |	| DTAC |	DE	LOGMV	ECHANGE	Q	SAME	OWNPCT	PLE-DOWN	OUTOWN	OUTPLD	N1	N2
| DCA |	1.00000 1036	0.99475 < 0.0001 1036	-0.02075 0.5047 1036	0.11720 0.0002 989	0.11076 0.0004 1036	0.09895 0.0018 989	-0.00585 0.8509 1036	-0.06258 0.0440 1036	0.03036 0.3299 1032	-0.03591 0.2544 1009	0.03191 0.3113 1009	0.04362 0.1662 1009	0.13674 < 0.0001 1020
| DTAC |	0.99475 < 0.0001 1036	1.00000 1036	-0.02145 0.4905 1036	0.12314 0.0001 989	0.11364 0.0002 1036	0.10554 0.0009 989	-0.00865 0.7808 1036	-0.06442 0.0382 1036	0.02819 0.3656 1032	-0.03939 0.2113 1009	0.03177 0.3134 1009	0.04149 0.1879 1009	0.13329 < 0.0001 1020
DE	-0.02075 0.5047 1036	-0.02145 0.4905 1036	1.00000 1046	-0.18323 < 0.0001 997	0.00227 0.9417 1046	-0.24463 < 0.0001 997	-0.06306 0.0414 1046	-0.11195 0.0003 1046	0.35727 < 0.0001 1042	-0.08627 0.0059 1018	0.28844 < 0.0001 1018	0.06686 0.0329 1018	0.09054 0.0037 1029
LOGMV	0.11720 0.0002 989	0.12314 0.0001 989	-0.18323 < 0.0001 997	1.0000 997	0.08354 0.0083 997	0.52253 < 0.0001 997	-0.13098 < 0.0001 997	-0.11056 0.0003 1046	-0.07221 0.0226 997	-0.04607 0.1419 1018	-0.03322 0.2983 982	0.15476 <0.0001 982	0.21105 <0.0001 992
ECHANGE	0.11076 0.0004 1036	0.11364 0.0002 1036	0.00227 0.9417 1046	0.08354 0.0083 997	1.00000 1046	0.19888 < 0.0001 997	0.07127 0.0211 1046	-0.11056 0.0003 1046	0.08680 0.0051 1042	0.68719 < 0.0001 1018	0.08902 0.0045 1018	-0.5548 0.0768 1018	-0.06446 0.0387 1029
Q	0.09895 0.0018 989	0.10554 0.0009 989	-0.24463 < 0.0001 997	0.52253 < 0.0001 997	0.19888 < 0.0001 997	1.0000 997	0.02916 0.3577 997	0.12693 < 0.001 997	-0.19183 < 0.001 997	-0.12897 < 0.0001 1014	-0.15891 < 0.0001 982	-0.10526 0.0010 982	-0.12990 <0.0001 992
SAME	-0.00585 0.8509 1036	-0.00865 0.7808 1036	-0.06306 0.0414 1046	-0.13098 < 0.0001 997	0.07127 0.0211 1046	0.02916 0.3577 997	1.00000 1046	0.02117 0.4941 1046	-0.02747 0.3758 1042	-0.04607 0.1419 1018	-0.03351 0.2855 1018	-0.07385 0.0184 1018	-0.17184 < 0.0001 1029
OWNPCT	-0.06258 0.0440 1036	-0.06442 0.0382 1036	-0.11195 0.0003 1046	0.05660 0.0741 997	-0.11056 0.0003 1046	0.12693 < 0.001 997	0.02117 0.4941 1046	1.00000 1046	-0.25868 < 0.0001 1042	0.68719 < 0.0001 1018	-0.21644 < 0.0001 1018	-0.03801 0.2257 1018	-0.04179 0.1702 1029
PLE-DOWN	0.03036 0.3299 1032	0.02819 0.3656 1032	0.35727 < 0.0001 1042	-0.07221 0.0226 997	0.08680 0.0051 1042	-0.19183 < 0.001 997	-0.02747 0.3758 1042	-0.25868 < 0.0001 1042	1.00000 1042	-0.12897 < 0.0001 1014	0.85035 < 0.0001 1014	0.00405 0.8974 1014	0.02338 0.4547 1025
OUTOWN	-0.03591 0.2544 1009	-0.03939 0.2113 1009	0.01433 0.6479 1018	0.10919 0.0006 982	-0.08627 0.0059 1018	-0.00528 0.8689 982	-0.04607 0.1419 1018	0.68719 < 0.0001 1018	-0.12897 < 0.0001 1014	1.00000 1070	-0.05318 0.0821 1070	0.23311 < 0.0001 1070	0.14273 < 0.0001 1070
OUTPLD	0.03191 0.3113 1009	0.03177 0.3134 1009	0.28844 < 0.0001 1018	-0.03322 0.2983 982	0.08902 0.0045 1018	-0.15891 < 0.0001 982	-0.03351 0.2855 1018	-0.21644 < 0.0001 1018	0.85035 < 0.0001 1014	-0.05318 0.0821 1070	1.00000 1070	0.03477 0.2557 1070	0.05888 0.0542 1070
N1	0.04362 0.1662 1009	0.04149 0.1879 1009	0.06686 0.0329 1018	0.15476 < 0.0001 982	-0.05548 0.0768 1018	-0.10526 0.0010 982	-0.07385 0.0184 1018	-0.03801 0.2257 1018	0.00405 0.8974 1014	0.23311 < 0.0001 1070	0.03477 0.2557 1070	1.00000 1070	0.86289 < 0.0001 1070
N2	0.13674 < 0.0001 1020	0.13329 < 0.0001 1020	0.09054 0.0037 1029	0.21105 < 0.0001 992	-0.06446 0.0387 1029	-0.12990 < 0.0001 992	-0.17184 < 0.0001 1029	-0.04179 0.1702 1029	0.02338 0.4547 1025	0.14273 < 0.0001 1070	0.05888 0.0542 1070	0.86289 < 0.0001 1070	1.00000 1081

Table 2 indicates the correlation coefficients for all the variables used in this paper. Table 2 shows that the control variables including firm size, volatility of earnings and Tobin's Q are positively related to the extent of earnings management. The ownership of board members and outside directors is negatively related to earnings management implying that the ownership of board members can reduce the extent of earnings management. The size of board is positively related to earnings management indicating that the larger the size of board the less efficient the monitoring from the board.

4.2. The effect of characteristics of board on earnings management

Table 3 examines the relationship between earnings management and the characteristics of board. In panel A, earnings management is measured by DTAC while earnings management is measured by DCA in panel B. Panel A of table 3 says that outside board size is negatively related to earnings manage-ment with coefficient = –0.0873 and p-value = 0.016. Nevertheless, the board size is positively related to earnings management with coefficient = 0.0512 and p-value = 0.0515.

Therefore, our hypotheses 1 and 3 are supported by our empirical results. For the control variables, we find that the volatility of earnings and Tobin's Q are significant for earnings management.

Table 3. Regression analyses on earnings management

Panel A : Dependent variable= | DTAC |

variable	parameter	Wald Chi-Square (Prob **>** Chi-Square)
Intercept	-3.6704	125.29 (**<** 0.0001)
N1	-0.0873	5.7992 (0.0160**)
OUTOWN	-0.0006	0.0140 (0.9057)
N2	0.0512	3.7932 (0.0515*)
OWNPCT	0.0014	0.0856 (0.7698)
PLEDOWN	0.0037	1.3444 (0.2463)
OUTPLD	-0.1505	0.2422 (0.6227)
SAME	0.1438	2.1202 (0.1454)
DE	-0.3885	1.6723 (0.1960)
LOGMV	0.0284	0.5524 (0.4574)
ECHANGE	2.0765	6.4985 (0.0108**
Q	0.2363	10.5947 (0.0011***)

Panel B : Dependent variable= | DCA |

variable	parameter	Wald Chi-Square (Prob **>** Chi-Square)
Intercept	-3.0872	93.06 (**<** 0.0001)
N1	-0.0977	7.6255 (0.0058**)
OUTOWN	-0.0000	0.0001 (0.9938)
N2	0. 0689 1.	7.2174 (0.0072**)
OWNPCT	0.0021	0.2158 (0.6423)
PLEDOWN	0.0060	3.6752 (0.0552*)
OUTPLD	-0.4638	2.4136 (0.1203)
SAME	0.1359	1.9883 (0.1585)
DE	-0.5961	4.1328 (0.0421**)
LOGMV	-0.0468	1.5763 (0.2093)
ECHANGE	2.7581	12.0368 (0.0005***)
Q	0.2410	11.5681 (0.0007***)

Please refer to the endnotes of table 1 for variable definition.

***, **, * represent 1%, 5% and 10% levels of significance, respectively. Number of observations : 975

Similar to the results of Panel A, Panel B also shows that outside board members can reduce the extent of earnings management while management engages in earnings management when faced with a larger size of board.

4.3. Group affiliation vs. non-group affiliation

Firms of group affiliation are managed under a central decision system. Therefore, group affiliation firms can be treated as a single unit rather than several individuals. As we mentioned before, the cash flows within the firms of group affiliation are less transparent and difficult to track. In table 4, we report the effect of board characteristics on earnings management for group affiliation firms and non-group affiliation firms.

Table 4. Regression analyses on earnings management for group affiliation firms and non-group affiliation firms

Panel A : Non-group affiliation firms

	Dependent variable			
	| DCA |		| DTAC |	
Intercept	-3.5498 (0.0001)	-3.6451 (0.0001)	-4.0543 (0.0001)	-4.1979 (0.0001)
N1	0.0099 (0.8569)	0.0281 (0.6155)	0.0412 (0.4538)	0.0687 (0.2217)
OUTOWN		-0.0071 (0.1771)		-0.0106 (0.0449) **
N2	-0.0221 (0.6241)	-0.0287 (0.5245)	-0.0572 (0.2070)	-0.0678 (0.1348)
OWNPCT	-0.0024 (0.6144)		-0.0035 (0.4580)	
PLEDOWN	0.0015 (0.6044)		0.0033 (0.2490)	
OUTPLD		0.1548 (0.5669)		0.3378 (0.2131)
SAME	0.1437 (0.2415)	0.1337 (0.2762)	0.0813 (0.5100)	0.0668 (0.5878)
DE	-0.0399 (0.9225)	-0.0174 (0.9655)	0.0541 (0.8956)	0.0949 (0.8143)
LOGMV	0.0131 (0.8281)	0.0274 (0.6523)	0.1018 (0.0940) *	0.1241 (0.0423) **
ECHANGE	5.2359 (0.0001) ***	5.1688 (0.0001) ***	4.5106 (0.0001) ***	4.4264 (0.0001) ***
Q	0.2134 (0.0275) **	0.1970 (0.0406) **	0.1675 (0.0854) *	0.1406 (0.1455)
Number of obser-vations	457	457	457	457

Panel A of table 4 presents the relationship between earnings management and board characteristics for non-group affiliation while panel B for group affiliation firms.

From table 4, we can see that the results in panel A are quite different from those in panel B. Columns 1 and 3 of panel B show that outside board size is negatively related to earnings management with coefficients = -0.1529 and -0.1545, respectively and p-value = 0.0004 and 0.0005, respectively. On the other hand, columns 1 and 3 of panel B indicates that board size is positively related to earnings management with coefficients = 0.1023 and 0.0974,

respectively and p-value = 0.0011 and 0.0026, respectively.

Obviously, the results of panel B in table 4 are quite similar to those in table 3 implying that group affiliation is the major source for the effect of board characteristics on earnings management.

Nevertheless, for the non-group affiliation firms, board characteristics are not significantly related to earnings management (panel A of table 4). We can see that board size and outside board size are not significant in panel A of table 4. Therefore, we argue that the results in table 4 are supportive of our hypothesis 5.

Panel B : Group affiliation firms

	Dependent ariable			
	| DCA |		| DTAC |	
Intercept	-2.7957 (0.0001)	-2.6559 (0.0001)	-3.6719 (0.0001)	-3.5825 (0.0001)
N1	-0.1529 (0.0004) ***	-0.1647 (0.0002) ***	-0.1545 (0.0005) ***	-0.1687 (0.0002) ***
OUTOWN		0.0043 (0.2871)		0.0052 (0.2186)
N2	0.1023 (0.0011) ***	0.1079 (0.0007) ***	0.0974 (0.0026) ***	0.1041 (0.0015) ***
OWNPCT	0.0055 (0.1854)		0.0040 (0.3420)	
PLEDOWN	0.0028 (0.2304)		0.0028 (0.2447)	
OUTPLD		-0.00276 (0.8966)		0.1212 (0.5804)
SAME	0.0769 (0.6106)	0.0951 (0.5293)	0.1517 (0.3307)	0.1626 (0.2973)
DE	-0.8585 (0.0422) **	-0.7259 (0.0808) *	-0.5021 (0.2499)	-0.4254 (0.3212)
LOGMV	-0.0715 (0.1629)	-0.0784 (0.1256)	-0.0184 (0.7281)	0.0118 (0.8232)
ECHANGE	1.2257 (0.2771)	1.3246 (0.2376)	0.5721 (0.6233)	0.6246 (0.5893)
Q	0.2457 (0.0179) **	0.2519 (0.0143) **	0.2557 (0.0170) **	0.2640 (0.0128) **
Number of observations	518	518	518	518

Please refer to the endnotes of table 1 for variable definition.
***, **, * represent 1%, 5% and 10% levels of significance, respectively.

4.4. Electronic firms vs. non-electronic firms

We further examine the board characteristics on earnings management for electronic firms and non-electronic firms. Firms in electronic industry face strong product competition and require professional management teams to be competitive. Typically, the institutional ownership dominates the ownership of board of electronic firms leading to less severe agency problem in electronic firms in Taiwan.

Table 5 reports the regression results of the relationship between earnings management and board characteristics. With panel A for non-electronic firms and panel B for electronic firms, columns 1 and 3 from panel A of table 5 indicate that outside board size is negatively related to earnings management with coefficients = –0.1148 and –0.1226, respectively and p-value = 0.0043 and 0.0040, respectively. Columns 1 and 3 of Panel A also show that board size is positively related to earnings manage-

ment with coefficients = 0.0927 and 0.0854, respectively and p-value = 0.0017 and 0.0065, respectively. Columns 2 and 4 of Panel A also point out that outside board size is negatively related to earnings management while board size is positively related to earnings management.

Obviously, board characteristics are influential to earnings management for non-electronic firms but not electronic firms. For electronic firms, from Panel B of table 5, we can see that outside board size is not related to earnings management.

Nevertheless, board size is negatively related to earnings management (at 10% level of significance). Contrary to Panel A indicating that board size is positively related to earnings management, we argue that board member in electronic firms are not linked to management and monitor the management efficiently. Therefore, we find that board size in electronic firms is negatively related to earnings management.

Table 5. Regression analyses on earnings management for electronic firms and non-electronic firms

Panel A：Non-electronic firms

	Dependent variable			
	| DCA |		| DTAC |	
Intercept	-3.5387 (0.0001)	-3.5754 (0.0001)	-4.0850 (0.0001)	-4.1157 (0.0001)
N1	-0.1148 (0.0043) ***	-0.1149 (0.0057) ***	-0.1226 (0.0040) ***	-0.1256 (0.0044) ***
OUTOWN		-0.0006 (0.8826)		0.0003 (0.9343)
N2	0.0927 (0.0017) ***	0.0913 (0.0024) ***	0.0854 (0.0065) ***	0.0857 (0.0073) ***
OWNPCT	0.0001 (0.9727)		-0.0004 (0.9316)	
PLEDOWN	0.0031 (0.1338)		0.0035 (0.1118)	
OUTPLD		0.1251 (0.5186)		0.2608 (0.2047)
SAME	0.1201 (0.3503)	0.1234 (0.3374)	0.1985 (0.1456)	0.2031 (0.1366)
DE	-0.5935 (0.0999) *	-0.4743 (0.1810)	-0.03702 (0.3334)	-0.2930 (0.4357)
LOGMV	-0.0000 (0.9994)	0.0080 (0.8820)	0.0644 (0.2585)	0.0685 (0.1088)
ECHANGE	2.9608 (0.0159) **	3.1793 (0.0093) ***	1.9312 (0.1385)	2.0787 (0.1965)
Q	0.1815 (0.1708)	0.1664 (0.2019)	0.1901 (0.1766)	0.1786 (0.1965)
Number of observations	625	625	625	625

Panel B: Electronic firms

	Dependent variable			
	| DCA |		| DTAC |	
Intercept	-1.8222 (0.0001)	-1.6834 (0.0001)	-2.3154 (0.0001)	-2.2077 (0.0001)
N1	0.0124 (0.8487)	-0.0066 (0.9209)	0.0378 (0.5366)	0.0030 (0.5996)
OUTOWN		0.0055 (0.3154)		0.0009 (0.8613)
N2	-0.1105 (0.0843) *	-0.1039 (0.1055)	-0.1001 (0.0970) *	-0.0995 (0.1005)
OWNPCT	0.0064 (0.2156)		0.0041 (0.3993)	
PLEDOWN	-0.0010 (0.7882)		0.0009 (0.7959)	
OUTPLD		-0.3764 (0.2656)		-0.0743 (0.8159)
SAME	0.0431 (0.7640)	0.0513 (0.7205)	-0.0378 (0.7797)	-0.0379 (0.7793)
DE	-0.3281 (0.5087)	-0.2588 (0.5945)	-0.2673 (0.5676)	-0.2080 (0.6501)
LOGMV	-0.1101 (0.0525) *	-0.1106 (0.0531) *	-0.0598 (0.2637)	-0.0594 (0.2706)
ECHANGE	2.8058 (0.0057) ***	2.6744 (0.0078) ***	2.1853 (0.0222) **	2.1180 (0.0255) **
Q	0.2163 (0.0109) **	0.2195 (0.0093) ***	0.2140 (0.0075) ***	0.2150 (0.0069) ***
Number of observations	350	350	350	350

Please refer to the endnotes of table 1 for variable definition.

***, **, * represent 1%, 5% and 10% levels of significance, respectively.

5. Conclusion

Financial statements can provide detailed information about the operations and profitability of the firms to the public. Therefore, the public investors make their investments at least partly based on the information from the firm's financial statements. However, when the firms engage in earnings management, the information revealed in the financial statements is biased and deviates from the truth. The board of directors is designed to monitor the management to avoid opportunistic behavior of the management including earnings management. This paper examines the effects of board of directors on earnings management and enables the investors to realize the possible expropriation from the management.

In this paper, we show that extent of earnings management is positively related to board size and is negatively related to the outside board size. Basically, the larger the board size, the less efficient the monitoring of the board. When there are more members in the board, it is more difficult for the board members to monitor the management. On the other hand, the outside directors are independent of the management and can monitor the management more efficiently. Therefore, the more outside directors in the board, the more efficient the monitoring from the outside directors and thus the less extent of earnings management. The size and composition of board of directors are the influential determinants for the monitoring function from the board. The ownership, collateralization and duality of chairman are not significantly related to the earnings management. We argue that we should not count on the board to monitor the management if no outside board member exists in the board. Investors can rely on the information revealed in the financial statements when there are more outside directors in the board.

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Appendix

This appendix explains how discretionary total accrual (DTAC) and discretionary current accrual (DCA) are measured. Total accruals consist of current accruals (CA) and long-term accruals (LA). Current accruals are measured as follows.

$$CA = \Delta(current\ assets - cash) \\ - \Delta(current\ liabilites - current\ maturity\ of\ long\ term\ debt) \tag{A.1}$$

Following Teoh et al. (1998), we apply cross-sectional Jones model (1991) to estimate annual discretionary accruals and non-discretionary accruals.

$$\frac{CA_{j,t}}{TA_{j,t-1}} = a_0\left(\frac{1}{TA_{j,t-1}}\right) + a_1\left(\frac{\Delta SALES_{j,t-}}{TA_{j,t-1}}\right) + \varepsilon_{j,t} \tag{A.2}$$

where, j is firm j in a specific industry; TA_j is total assets.

Non-discretionary accruals (NDCA) represent accruals from sales which cannot be managed by the issuers. NDCA is measured by (A.3) as in modified Jones model.

$$NDCA_{it} = \hat{a}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{a}_1\left(\frac{\Delta SALES_{it} - \Delta AR_{it}}{TA_{i,t-1}}\right) \tag{A.3}$$

where, ΔAR_{it} is the change of receivables of i with the same industry as j at time t. With the estimated $NDCA_{it}$, DCA_{it} is measured by (A.4).

$$DCA_{it} = \frac{CA_{it}}{TA_{i,t-1}} - NDCA_{it} \tag{A.4}$$

DTAC is measured by the same procedure in (A.2), (A.3) and (A.4), except that PPE is considered as an additional independent variable to reflect the long-term accruals such as depreciation.

$$\frac{TAC_{j,t}}{TA_{j,t-1}} = b_0\left(\frac{1}{TA_{j,t-1}}\right) + b_1\left(\frac{\Delta SALES_{j,t}}{TA_{j,t-1}}\right) + b_2\left(\frac{PPE_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t} \tag{A.5}$$

$$NDTAC_{it} = \hat{b}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{b}_1\left(\frac{\Delta SALES_{it} - \Delta AR_{it}}{TA_{i,t-1}}\right) + \hat{b}_2\left(\frac{PPE_{it}}{TA_{i,t-1}}\right) \tag{A.6}$$

$$DTAC_{it} = \frac{TAC_{it}}{TA_{i,t-1}} - NDTAC_{it} \tag{A.7}$$