

Board Member Characteristics and Ownership Structure Impacts on Real Earnings Management: Evidence from Taiwan

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Abstract

This study tests the impacts of board member characteristics and ownership structure on real earnings management for firms listed in Taiwan. Rather than examining board member characteristics individually, a “board member quality index” is established based on seven different factors of the board member characteristics (independence, ownership, professionalism, education, busyness, meeting attendance and pledges). This index is used as a proxy measure of the characteristics of the board members. The results reveal that better board member quality results in greater suppression of real earnings management and indicate that our index is successful in evaluating the effectiveness of the board member characteristics of firms in Taiwan. In addition, this study finds that institutional investor ownership of Taiwanese firms plays an important role in curbing real earnings management. However, managerial ownership does not influence the ownership-real earnings management relationship.

Keywords: board member characteristics, ownership structure, real earnings management, big4, Taiwan

1. Introduction

Earnings management serves as a signaling mechanism (Sankar & Subramanyam, 2001; Stocken & Verrecchia, 2004) and can either be treated or not treated as an opportunistic form of behavior (Hadani, Goranova, & Khan, 2011). Its opportunistic role is probably more common among publicly-listed firms and real and accrual-based activities are two alternative opportunistic ways of managing earnings (Dechow, Hutton, Kim, & Sloan, 2012; Man & Wong, 2013). Accrual-based earnings management is generally regarded as a less visible and less costly method while real earnings management is likely to lead to a reduction in value due to the misallocation of appropriate corporate activities (Visvanathan, 2008). Managers are inclined to make choices between the two earnings management policies in the post-Enron and post-Sarbanes-Oxley era (Badertscher, 2011; Cohen, Deyand, & Lys, 2008; Cohen & Zarowin, 2010; Zang, 2012). Therefore, while a large body of academic research examines the causes and consequences of earnings management through accounting accruals (Dechow, Sloan, & Sweeney, 1996; Dechow & Skinner, 2000), a growing literature also examines how managers can also achieve earnings targets by manipulating real activities (Chan, Yuen, Xu, & Nini, 2014; Chi, Lisic, & Pevzner, 2011; Graham, Harvey, & Rajgopal, 2005; Kang & Kim, 2012; Roychowdhury, 2006; Zgarni, Halioui, & Zehri, 2014). Thus, this study aims to focus on the issue of real earnings management.

The composition of the board of directors and ownership structure have typically been treated as the most salient aspects of corporate governance mechanisms in mitigating real or accrual-based earnings management (Adams, Hermalin, & Weisbach, 2010; Anderson, Reeb, Upadhyay, & Wanli, 2011; Garc ía-Meca & Sánchez-Ballesta, 2009; Sitthipongpanich & Polsiri, 2013). Previous studies have primarily documented that certain board of director characteristics are related to real earnings management. However, no prior attempt has been made to find a composite measure of the director member characteristics. Thus, the first objective of this study is to incorporate seven characteristics of the firm’s board members (independence, ownership, professionalism, education, busyness, meeting attendance and pledges) to establish a board member quality index and investigate the effects of board member characteristics on real earnings management as a whole for firms listed in Taiwan.

This study shows that our index is successful in examining the effectiveness of the board member characteristics of Taiwanese firms by indicating that firms with better board member quality as indicated by our index do mitigate real

earnings management effectively. Besides, managerial and institutional ownership are two streams of thought of the major internal governance mechanisms that help control agency problems and institutional investors are major shareholders in many listed firms in Taiwan (Huang & Shiu, 2009). Therefore, the second objective of this study is to seek to complement the ownership structure literature and investigate whether managerial and institutional ownership play a constraining or a managerial opportunism role in real earnings management. The empirical results reveal that institutional investor ownership plays an important role in curbing real earnings management for firms listed in Taiwan. However, the results do not provide evidence to support the view that managerial ownership influences the ownership-real earnings management relationship.

Our study contributes added value to the extant literature in several ways. First, while most studies have indicated that the board of directors has an impact on corporate real earnings management, our study includes board member characteristic variables from the agency, sociological and management perspectives to construct a board member quality index to comprehensively consider the effectiveness of the directors. Second, our study adds to the growing literature on the corporate governance monitoring aspects of institutional ownership and shows that institutional investors play an active role in constraining the opportunistic real earnings management for firms listed in Taiwan. Third, our findings provide implications for the authorities in that regulators should pay attention to enhance the role of directors in firms and investors can also gain further insight into the characteristics of the board members.

The remainder of this study is organized as follows. The second section reviews the literature and develops our hypotheses. The third section describes our research design. The fourth section presents the empirical results and additional analyses. Finally, the fifth section provides a summary and presents the concluding remarks.

2. Hypotheses Development

2.1 Board Member Characteristics and Real Earnings Management

To mitigate the agency problems resulting from earnings management, empirical research has identified some of the corporate governance factors and has shown that earnings management through real activities or accounting accruals is constrained by these mechanisms such as the board characteristics or ownership structure (Adams et al., 2010; Anderson et al., 2011; Garc ía-Meca & Sánchez-Ballesta, 2009; Kang & Kim, 2012; Sitthipongpanich & Polsiri, 2013). With respect to the board characteristics, while most of the previous research addresses the issue of whether firms with independent outside directors on the board are effective in mitigating real activity-based earnings management activities (Garc ía Osma, 2008; Kang & Kim, 2012; Zgarni et al., 2014), Visvanathan (2008) finds that most overall board characteristics that have been found to be significant in limiting accrual-type earnings management are not significant in limiting real earnings management except for the proportion of independent directors. Therefore, this study first seeks to include independent directors as one of the director characteristics to examine the monitoring role of the directors in deterring real earnings management. As to the ownership structure, based on prior research that provides mixed results regarding the impact of director ownership on discretionary accruals earnings management (Cornett, Marcus, & Tehranian, 2008; Dechow et al., 1996; Garc ía-Meca & Sánchez-Ballesta, 2009; S áenz Gonz ález & Garc ía-Meca, 2007; Teshima & Shuto, 2008; Yang, Lai, & Tan, 2008), director ownership is the second factor that is included in the board member characteristics referred to in this study.

In addition to the agency perspective, the sociological and management literature has begun to incorporate issues of professionalism, diligence, and resource dependence into their analyses (Adams et al., 2010; Anderson et al., 2011; Guner, Malmendier, & Tate, 2008; Jeanjean & Stolowy, 2009). In regard to the expertise literature, Bhagat and Black (1999) show that director experiences and expertise influence firm performance more than director independence. Chen, Elder, and Hsieh (2007) conclude that only if the outside directors have accounting/financial expertise, will the probability of earnings management be decreased. Prior studies indicate that board capital affects both board monitoring and the provision of resources and the educational background represents the individual human capital and competence of the directors (Anderson et al., 2011; Hillman & Dalziel, 2003; Jermias & Gani, 2014; Reeb & Zhao, 2013; Sitthipongpanich & Polsiri, 2013). Thus, based on these prior studies, this study incorporates the two factors of director professionalism and education into the board member characteristics.

In regard to the diligence or service of the boards, Ferris, Jagannathan, and Pritchard (2003), Harris and Shimizu (2004) and Field, Lowry, and Mkrtychyan (2013) support the notion that busy directors (where many directors hold board seats in multiple firms) can fulfill their governance responsibility effectively. However, some studies demonstrate that busy boards may not effectively monitor management (Fich & Shivdasani, 2006; Jiraporn, Singh, & Lee, 2009b). In addition, Jiraporn, Davidson III, DaDalt, & Ning (2009a) report that busy directors exhibit a higher tendency to be absent from board meetings. Xie, Davidson, and DaDalt (2003) and S áenz Gonz ález and Garc ía-Meca (2007) all conclude that a board that meets more often could be able to devote more time to constraining accrual

earnings management. Because the prior literature on the impacts of busyness and meeting attendance on real earnings management has been sparse and is still relatively new, this study seeks to incorporate these two factors into the board member characteristics.

Finally, in the resource dependence context, Jeanjean and Stolowy (2009) document that directors can play a role in facilitating equity and debt financing resource-dependence. Directors in Taiwan probably use their stock as a loan collateral resource to finance firm projects because of a lack of funds or when the firms have a high degree of observed riskiness and still retain the ownership rights of those stocks (Chen & Kao, 2011). Chen and Ho (2009) argue that the proportion of director-ownership-in-pledge is positively related to Taiwan family-controlled firms' policies. Thus, the director-ownership-in-pledge is employed as the final factor of board member characteristics in this study. A multi-theoretic approach to corporate governance is essential for recognizing the many mechanisms and structures that might reasonably enhance organizational functioning (Sarkar, Sarkar, & Sen, 2008). Therefore, based on Gompers, Ishii, and Metrick (2003) and in a departure from prior research that has focused primarily on how a single trait is correlated with real earnings management, the first objective of this study is to comprehensively consider the effects of director roles in real earnings management by aggregating the seven director characteristics as a proxy for the board member quality index. Based on extant research, this study expects that firms with better board member quality could constrain real earnings management more effectively. Thus, we propose:

Hypothesis 1. Board member quality will be negatively related to real earnings management.

2.2 Ownership Structure and Earnings Management

In a meta-analysis study, Garc ía-Meca and S áncchez-Ballesta (2009) document that another important mechanism to constrain the opportunistic behavior of managers is the ownership structure in addition to the board of directors. Managerial and institutional ownerships are two streams of thought of the major internal mechanisms that help control agency problems. With respect to managerial ownership, there is no consensus in studies examining the relationship between managerial ownership and earnings management. The alignment theory posits that insiders or managers with higher levels of insider ownership are less likely to engage in aggressive reporting that will damage their inherent ownership benefits (Alves, 2012; Huang, Wang, & Zhou, 2013; Salem Alzoubi & Selamat, 2012; Warfield, J. Wild, & K. Wild, 1995). However, the entrenchment theory documents that firms with higher insider or managerial ownership are associated with more earnings management (Al-Fayoumi, Abuzayed, & Alexander, 2010; Bergstresser & Philippon, 2006; Cheng & Warfield, 2005; Jiang, Petroni, & Wang, 2010; Klein, 2002).

On the other hand, some prior studies find evidence of a non-monotonic association between managerial ownership and earnings management (Hutchinson & Leung, 2007; S áenz Gonz ález & Garc ía-Meca, 2007). Inspired by the mixed results mentioned above and by Yang et al. (2008) who find that discretionary accruals first increase and then decrease with executive ownership for firms listed in Taiwan, the second objective of our study is to examine the impact of managerial ownership on real earnings management. We do not, however, predict the sign of the relationship between managerial ownership and real earnings management for there is no consensus regarding the results of prior studies. Therefore, in this study we construct the following hypothesis:

Hypothesis 2a. Managerial ownership will be related to real earnings management.

Most prior studies provide evidence and indicate that institutional investors play an active role in controlling managerial discretion (Baik & Choi, 2010; Koh, 2003; Roychowdhury & Watts, 2007; S áenz Gonz ález & Garc ía-Meca, 2007; Salem Alzoubi & Selamat, 2012). Nevertheless, Alves (2012) finds no evidence of an association between institutional investors and earnings management for Portuguese firms. Farooq and Jai (2012) and Hadani et al. (2011) each show that the largest institutional owners are negatively related to earnings management. Based on Lin and Manowan (2012) find a significant positive relationship between transient institutional investor ownership (holding diversified portfolios with high turnover) and discretionary accruals for US firms. In recent years, institutional investors have been major shareholders for many listed firms in Taiwan, representing 80 percent of daily transactions, and the investment decisions of the institutional investors have been perceived as informed and knowledgeable by domestic investors (Barber, Lee, Liu, & Odean, 2009; Hsu & Wang, 2014; Huang & Shiu, 2009; Liang, Lin, & Chin, 2012). Based on the prior literature mentioned above and the study by Lin, Wu, Fang, and Wun (2014) that finds a negative association between earnings management and institutional ownership for Taiwanese firms, our study further examines whether institutional ownership helps control real earnings management agency problems and constructs the following hypothesis:

Hypothesis 2b. Institutional ownership will be negatively related to real earnings management.

3. Research Design

To investigate the hypotheses developed in this study, we use the following regression model to test the relationship between director characteristics and ownership structure on real earnings management. The specifications of the variables are shown in Table 1.

$$REMI_{it} = a_0 + a_1 BOMEQ_{it} + a_2 OMANI_{it} + a_3 OINST_{it} + a_4 LEV_{it} + a_5 SIZE_{it} + a_6 DUAL_{it} + a_7 ROA_{it} + a_8 BIG4_{it} + a_9 MB_{it} + a_{10} BONUS_{it} + \delta DYEAR + \phi DIND + \varepsilon_{it} \quad (1)$$

3.1 Dependent Variable

Because firms that manage earnings are likely to use multiple activities and to capture overall effects of abnormal real earnings management activities, this study constructs a real earnings management index (REMI) as the dependent variable in our regression model by aggregating the three individual measures related to real earnings management: the abnormal levels of cash flow from operations, production costs, and discretionary expenses (Cohen et al., 2008; Chi et al., 2011; Kang & Kim, 2012). The abnormal level of each measure is computed as the actual level of a variable minus its normal level. Consistent with Chi et al. (2011) and Kang and Kim (2012), we estimate the normal levels of cash flow from operations, production costs, and discretionary expenses using a procedure developed by Dechow, Kothari, and Watts (1998) and implemented by a number of studies (Cohen et al., 2008; Roychowdhury, 2006; Visvanathan, 2008; Zang, 2012; Zgarni et al. 2014). Following Cohen et al. (2008) and Chi et al. (2011), this study then develops a comprehensive measure of real earnings management by combining the three individual standardized measures. Firms with a higher index (REMI) indicate a higher level of overall real earnings management.

Table 1. Variable Definitions

Variable	Definition
REMI	Real earnings management index, which equals the sum of the standardized measure of abnormal cash flows, abnormal inventory over-production, and abnormal discretionary expenses
BOMEQ	Board member quality dummy, which takes a value of 1 if the director characteristic index of the firm is larger than the median of the sample, and 0 otherwise
OMANI	Managerial ownership, which equals the percentage of outstanding shares owned by CEOs, and excludes CEOs with dual roles
OINST	Institutional ownership, which equals the percentage of outstanding shares owned by institutional investors, and includes domestic and foreign financial institutions and trust funds
LEV	Total debt to total assets
SIZE	Natural logarithm of total assets
DUAL	Duality dummy, which takes a value of 1 if the chairman and CEO positions are held by the same person, and 0 otherwise
ROA	Return on assets, which equals the ratio of the sum of the profit after tax plus interest expenses to total assets
BIG4	Auditor dummy, which takes a value of 1 if the firm's auditor is among the top-4 auditing firms, and 0 otherwise
MB	The ratio of the market value of equity to the book value of equity
BONUS	Natural logarithm of bonus compensation received by the top level managers
DYEAR	Year dummy variables
DIND	Industry dummy variables

3.2 Independent Variables

To examine Hypothesis H1, we incorporate seven factors related to the board member characteristics (independence, ownership, professionalism, education, busyness, meeting attendance and pledges) into our study that are based on prior studies. To avoid the confounding effect by which the different director characteristics would lead to different predictions of the director effectiveness and would interact with each other, this study constructs a board member quality index (BOMEQ) by aggregating the seven characteristics related to effectiveness and then uses this index as a

proxy for the quality of the board member characteristics of a firm. Thus, BOMEQ can range from zero to seven, with BOMEQ equal to seven (zero) representing the firms with the best (worst) director quality. Based on prior studies such as those referred to above, the seven factors of board member characteristics can be measured as follows:

1. Independence: The independent directors are captured as a dummy variable and coded as 1 if the proportion of independent directors on the board of a firm is larger than the median of the sample firms, and 0 otherwise.
2. Ownership: A director ownership is captured as a dummy variable and coded as 1 if the percentage of shares owned by the directors in a company is larger than the median of the sample firms, and 0 otherwise.
3. Busyness: Busyness is captured as a dummy variable and coded as 1 if the average number of seats that busy directors hold in a company is smaller than the median of the sample firms, and 0 otherwise.
4. Meeting attendance: The director meeting attendance is captured by a dummy variable and coded as 1 if the average meeting attendance of the director members in a company is larger than the median of the sample firms, and 0 otherwise.
5. Professionalism: The director professionalism is coded as 1 if the directors in a company have accounting, finance, business, or legal expertise, and 0 otherwise. The director professional dummy variable is then defined as 1 if the proportion of the professional heterogeneity on the board of a company is larger than the median of the sample firms, and 0 otherwise.
6. Education: The educational levels are coded as follows: 1-below middle school/vocational, 2-middle school/vocational, 3-bachelor, and 4-master or doctoral, to rank the educational degrees. The board educational heterogeneity is defined as a dummy variable and is coded as 1 if the average educational level in a firm is larger than the median of the sample firms, and 0 otherwise. Finally, the pledge ratio is captured as a dummy variable and coded as 1 if the percentage of the ownership-in-pledge of directors' shareholdings in a company is smaller than the median of the sample firms, and 0 otherwise.

To investigate hypotheses H2a and H2b, this study employs both managerial and institutional ownership to examine their effects on real earnings management, respectively. Based on prior studies, managerial ownership (OMANI) is measured as the percentage of outstanding shares owned by CEOs, which excludes the duality CEO, and institutional ownership (OINST) equals the percentage of outstanding shares owned by institutional investors, which includes domestic and foreign financial institutions and trust funds.

3.3 Control Variables

A number of firm-specific control variables included in the models are all based on the existing literature (Cohen et al., 2008; Chi et al., 2011; Kang & Kim, 2012; Roychowdhury, 2006; Visvanathan, 2008; Zang, 2012; Zgarni et al., 2014). Specifically, this study uses firm leverage, size, CEO duality, the ratio of the return on assets, big4 auditor, the market-to-book ratio, top managers' bonus compensation, firm year, and industry dummies as control variables. Firm leverage (LEV) is measured as total debt divided by total assets. Firm size (SIZE) is defined as the natural logarithm of the firm's total assets. CEO duality (DUAL) is a dummy variable that takes a value of one if the chairman and CEO positions are held by the same person, and zero otherwise (Liu & Lu, 2007). The return on assets ratio (ROA) is measured as the sum of profit after tax plus interest expenses divided by total assets. Big4 auditor (BIG4) is a dummy variable that takes a value of one if the firm's auditor is among the top-4, and zero otherwise. Market-to-book value (MB) is the market value of equity divided by the book value of equity. The top managers' bonus compensation (BONUS) is defined as the natural logarithm of bonus compensation received by the top managers. Finally, this study adds year and industry dummy variables to account for the unobserved variation.

3.4 Sample Data

The sample firms employed in this study include firms listed in Taiwan for the period from 2006 to 2010. The sample period begins with the year 2006 because the data regarding the director and supervisor professionalism and service are only available from the Taiwan Economic Journal (TEJ) database since 2006. Data on accounting and financial information are also sourced from the TEJ database. Our initial sample includes 6,783 firm-year observations. We drop the finance and insurance industries due to the unique nature of their regulations and requirements. After deleting firm-years with missing data and observations used in the process of estimating variables, a total of 5,788 firm-year observations that span 19 different industries are included in our study to examine our hypotheses. For the sake of brevity, this study does not provide the results of the year and industry distributions of the samples. The electronics industry is the biggest industry in the Taiwan stock market, and accounts for 57.65% of the main real earnings management sample. The chemical and construction industries are the next two more than proportional industries and account for 6.93% and 5.01% of our sample, respectively. The listed sample firms have grown steadily and slowly over the sample period and their number has risen from 1,043 in 2006 to 1,254 in 2010. We have deleted the top and bottom 1% of the distribution to minimize the influence of outlier observations.

4. Empirical Analysis

4.1 Descriptive Statistics

Table 2 reports the descriptive statistics of our sample, and shows that on average the real earnings management index (REMI) is -0.033 and the mean value of the board member quality (BOMEQ) is 0.359. The means of the managerial ownership (OMANI) and institutional ownership (OINST) are 0.012 and 0.08, respectively. On average, the leverage level (LEV) is 41.5%. The mean of the firm size (SIZE) is 21.442. On average, 29.4% of the listed firms have a CEO duality structure (DUAL). The mean of the returns on total assets (ROA) and market-to-book ratio (MB) are 9.756% and 180.9%, respectively. On average, 83.2% of the listed firms are audited by a big4 auditor (BIG4). The mean value of the natural logarithm of managerial bonus compensation (BONUS) is 4.228.

Before carrying out any regressions, one should be aware of potential multicollinearity. For the sake of brevity, this study does not provide the results of the correlation coefficients of the sample. Almost all of the correlations are significant at least at the 10% level. The real earnings management index is negatively correlated with both board member quality and institutional investor ownership, implying that firms with better board member quality and a higher level of institutional ownership exhibit a lower level of real earnings management. Obviously, the real earnings management activity declines with CEO duality, increased returns on total assets, the market-to-book ratio, big4 auditor and managerial bonus compensation. Moreover, firms with higher leverage and larger in size are more likely to engage in real earnings management. The relationships suggest that all of the explanatory variables are important in explaining the corporate real earnings management levels. While most of the independent variables are highly correlated with the others, the variable inflation factors (VIF) of the variables in the regressions amount to 3 and suggest that a severe multicollinearity problem does not exist.

Table 2. Descriptive Statistics (N=5,788)

Variable	Mean	Median	Std. Deviation	Minimum	Maximum
REMI	-0.033	0.252	1.296	-9.199	2.307
BOMEQ	0.359	0.480	0.000	0.000	1.000
OMANI	0.012	0.023	0.000	0.004	0.253
OINST	0.080	0.059	0.078	0.000	0.272
LEV	0.415	0.417	0.181	0.006	0.991
SIZE	21.442	21.278	1.392	15.513	27.300
DUAL	0.294	0.000	0.455	0.000	1.000
ROA	9.756	9.170	8.250	-8.710	28.790
BIG4	0.832	1.000	0.374	0.000	1.000
MB	1.809	1.380	2.541	0.080	119.630
BONUS	4.228	4.187	0.451	2.538	6.343

Variable definitions: REMI is a real earnings management index, which equals the sum of the standardized measure of abnormal cash flows, abnormal inventory over-production, and abnormal discretionary expenses; BOMEQ is a board member quality dummy, which takes a value of 1 if the director characteristic index of the firm is larger than the median of the sample, and 0 otherwise; OMANI represents managerial ownership, which equals the percentage of outstanding shares owned by CEOs, and excludes CEOs with dual roles; OINST is institutional ownership, which equals the percentage of outstanding shares owned by institutional investors, and includes domestic and foreign financial institutions and trust funds; LEV is measured as total debt divided by total assets; SIZE is the natural logarithm of total assets; DUAL is a duality dummy, which takes a value of 1 if the chairman and CEO positions are held by the same person, and 0 otherwise; ROA is the return on assets, which equals the ratio of the sum of the profit after tax plus interest expenses to total assets; BIG4 is an auditor dummy, which takes a value of 1 if the firm's auditor is among the top-4 auditing firms, and 0 otherwise; MB is the ratio of the market value of equity to the book value of equity; and BONUS is the natural logarithm of bonus compensation received by the top-level managers.

4.2 Empirical Results

The results of the regression analyses of board member characteristics and ownership structure on real earnings management are provided in Table 3. The board member quality (BOMEQ) coefficients in Columns 1 and 4 of Table 3 are all negative and significant at the 1 percent level. The significantly negative results indicate that firms with better board member quality exhibit a lower level of real earnings management and are in line with the argument proposed by prior research (Sarkar et al., 2008; Zgarni et al., 2014). We certainly do not incorporate all the board member characteristics into our board member quality index. However, the empirical results document that the board member quality index constructed by this study can serve as an effective monitoring proxy to mitigate real earnings management practice for firms listed in Taiwan. The empirical results reveal that our index is successful in examining the effectiveness of the board member characteristics and provide evidence in support of the first hypothesis H1.

Table 3. Regression Analyses of Board Member Characteristics and Ownership Structure Impacts on Real Earnings Management (N=5,788)

Variable	Predicted Sign	Column 1	Column 2	Column 3	Column 4
		Coefficient	Coefficient	Coefficient	Coefficient
Intercept	+/-	-4.16 (-1.590)*	-4.380 (-1.670)**	-4.006 (-1.530)*	-4.07 (-1.550)*
BOMEQ	-	-0.138 (-3.730)***			-0.155 (-4.130)***
OMANI	+		0.220 (0.288)		0.239 (0.300)
OINST	-			-0.584 (-2.560)***	-0.518 (-2.260)**
LEV	+	0.122 (1.200)	0.162 (1.600)*	0.150 (1.490)*	0.119 (1.180)
SIZE	+	0.301 (2.150)**	0.298 (2.120)**	0.283 (2.020)**	0.281 (2.000)**
DUAL	-	-0.054 (-1.450)*	-0.044 (-1.170)	-0.044 (-1.200)	-0.052 (-1.390)*
ROA	-	-0.009 (-3.670)***	-0.010 (-4.090)***	-0.010 (-3.840)***	-0.010 (-3.740)***
BIG4	-	-0.020 (-0.440)	-0.019 (-0.420)	-0.011 (-0.240)	-0.012 (-0.260)
MB	-	-0.248 (-1.730)**	-0.290 (-2.020)**	-0.257 (-1.800)**	-0.249 (-1.740)**
BONUS	-	-0.063 (-1.430)*	-0.021 (-0.480)	-0.028 (-0.630)	-0.026 (-0.590)
DYEAR		YES	YES	YES	YES
DIND		YES	YES	YES	YES
F Value		21.240***	21.800***	22.130***	20.220***
Adjusted R ²		6.890%	6.640%	6.820%	7.060%

Notes: Robust *t*-statistics are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions: REMI is a real earnings management index, which equals the sum of the standardized measure of abnormal cash flows, abnormal inventory over-production, and abnormal discretionary expenses; BOMEQ is a board member quality dummy, which takes a value of 1 if the director characteristic index of the firm is larger than the median of the sample, and 0 otherwise; OMANI represents managerial ownership, which equals the percentage of outstanding shares owned by CEOs, and excludes CEOs with dual roles; OINST is institutional ownership, which equals the percentage of outstanding shares owned by institutional investors, and includes domestic and foreign financial institutions and trust funds; LEV is measured as

total debt divided by total assets; SIZE is the natural logarithm of total assets; DUAL is a duality dummy, which takes a value of 1 if the chairman and CEO positions are held by the same person, and 0 otherwise; ROA is the return on assets, which equals the ratio of the sum of the profit after tax plus interest expenses to total assets; BIG4 is an auditor dummy, which takes a value of 1 if the firm's auditor is among the top-4 auditing firms, and 0 otherwise; MB is the ratio of the market value to the book value of equity; BONUS is the natural logarithm of bonus compensation received by the top-level managers; DYEAR represents the year dummy variables; and DIND represents the industry dummy variables.

However, the managerial ownership (OMANI) coefficients in Columns 2 and 4 of Table 3 are positive but not significant and are not consistent with prior research. The results demonstrate that managerial ownership does not induce an entrenchment effect in real earnings management and also does not provide evidence in support of Hypothesis H2a. In Columns 3 and 4 of Table 3, the institutional ownership (OINST) coefficients are all negative and significant at the 1 percent level. The significantly negative effects of the institutional ownership on real earnings management demonstrate that institutional investor ownership for Taiwanese firms plays an important role in corporate governance. The results show that institutional investors can reduce the number of managers and others who engage in real earnings management and provide evidence in support of the second hypothesis H2b that is consistent with prior research (Koh, 2003; Lin et al., 2014; Roychowdhury & Watts, 2007; Salem Alzoubi & Selamat, 2012). In regard to the control variables, the results in Table 3 are generally in the predicted directions and are consistent with the prior literature (Cohen et al., 2008; Chi et al., 2011; Kang & Kim, 2012; Roychowdhury, 2006; Visvanathan, 2008; Zang, 2012; Zgarni et al., 2014). Collectively, these results suggest that firms that have higher leverage, are large in size, do not have CEO duality, and have lower returns on assets, fewer growth opportunities, and pay out less bonus compensation are more likely to engage in aggressive real earnings management.

4.3 Sensitivity Analysis

Table 4. Regression Analyses of Board Member Characteristics and Ownership Structure Impacts on Real Earnings Management-Subsamples

Variable	Predicted Sign	Column 1 (Big4 N=4,817)		Column 2 (Non-big4 N=971)	
		Coefficient	t-value	Coefficient	t-value
Intercept	+/-	0.887	2.370**	-2.345	-2.750
BOMEQ	-	-0.143	-3.410***	-0.085	-0.850
OMANI	+/-	-0.387	-0.430	2.760	1.840**
OINST	-	-0.779	-3.120***	0.189	0.350
LEV	+	0.236	1.990**	-0.171	-0.660
SIZE	+	-0.025	-1.440	0.159	3.350***
DUAL	-	-0.027	-0.630	-0.111	-1.390*
ROA	-	-0.010	-2.760***	-0.009	-1.430*
MB	-	-0.013	-2.410***	-0.019	-2.130**
BONUS	-	-0.036	-0.500	-0.141	-1.030
DYEAR		YES		YES	
DIND		YES		YES	
F Value		16.760***		8.860***	
Adjusted R ²		7.320%		11.290%	

Notes: Robust *t*-statistics are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Variable definitions: REMI is a real earnings management index, which equals the sum of the standardized measure of abnormal cash flows, abnormal inventory over-production, and abnormal discretionary expenses; BOMEQ is a board member quality dummy, which takes a value of 1 if the director characteristic index of the firm is larger than the median of the sample, and 0 otherwise; OMANI represents managerial ownership, which equals the percentage of outstanding shares owned by CEOs, and excludes CEOs with dual roles; OINST is institutional ownership, which equals the percentage of outstanding shares owned by institutional investors, and includes domestic and foreign financial institutions and trust funds; LEV is measured as total debt divided by total assets; SIZE is the natural logarithm of total assets; DUAL is a duality dummy, which takes a value of 1 if the chairman and CEO positions are held by the same person, and 0 otherwise; ROA is the return on assets, which equals the ratio of the sum of the profit after tax plus interest expenses to total assets; MB is the

ratio of the market value of equity to the book value of equity; BONUS is the natural logarithm of bonus compensation received by the top-level managers; DYEAR represents the year dummy variables; and DIND represents the industry dummy variables.

The prior literature indicates that the big N auditors supply higher-quality external monitoring than the non-big N auditors and finds that clients of the big N auditors have lower absolute values of discretionary accruals since the big N auditors have the technological capability to detect earnings management (Chi et al., 2011; Fan & Wong, 2005; Francis, Maydew, & Sparks, 1999; Kim, Chung, & Firth, 2003). This leads us to perform a supplementary test to examine the robustness of the effects of board member characteristics and ownership structure on real earnings management for big4 and non-big4 audited firms. This study arrives at the results by dividing the sample into two sub-samples that are audited by big4 and non-big4 audit firms, respectively.

The results of the additional analyses of director characteristics and ownership structure on real earnings management (REMI) for the two sub-samples based on the variable big4 auditor are provided in Table 4. The results in Columns 1 and 2 of Table 4 show different effects regarding the board member quality on real earnings management. As shown in Table 3, the board member quality index (BOMEQ) and institutional ownership (OINST) coefficients are both negative and significant at the 1 percent level in Column 1 of Table 4. Nevertheless, the two coefficients in Column 2 of Table 4 are not significant. These findings show that directors' quality and institutional ownership have more impacts in helping ameliorate the real earnings management for firms audited by a big4 auditor and provide additional evidence in support of hypotheses H1 and H2b. In contrast to Table 3, the managerial ownership (OMANI) coefficients in Columns 1 and 2 of Table 4 are positive and significant at the 5 percent level for firms audited by a non-big4 auditor, but are not significant for non-big4 audited firms. The results indicate that higher managerial ownership is associated with more real earnings management for firms audited by a non-big4 auditor. These findings provide evidence in support of hypothesis H2a and are consistent with the prior literature (Al-Fayoumi et al., 2010; Bergstresser & Philippon, 2006; Cheng & Warfield, 2005; Jiang et al., 2010; Klein, 2002). The results may provide evidence to explain why the managerial ownership coefficient is not significant and also why hypothesis H2a is not supported in Table 3.

5. Conclusion

This study investigates the relationships between board member characteristics and ownership structure and their impacts on real earnings management. In the first part, rather than examining board member characteristics individually, we incorporate seven characteristics of the firm board members into one index to proxy for the measure of board member quality and investigate the effects of the index on real earnings management for firms listed in Taiwan. The empirical results reveal that our index is successful in examining the effectiveness of the board member characteristics of firms in Taiwan. The empirical evidence suggests that our index can be used as a valuable measure of director quality and board member quality plays an important role in depressing real earnings management. In the second half of the study, the evidence shows that firms with higher institutional ownership can provide monitoring protection from the incidence of opportunistic real earnings management behavior. However, managerial ownership does not influence the ownership-real earnings management relationship and higher managerial ownership is associated with more real earnings management only for firms audited by a non-big4 auditor.

We note that there are some limitations to our study. First, while this study incorporates seven characteristics of the firm board members into one index to proxy for the measure of board member quality, we are only capturing some aspects of board members. Further research that incorporates more board member characteristics such as gender or age to establish a director quality index may further verify the propositions of our study. Second, the measurement of the director quality index used in this study weights all board member characteristics equally and ignores their relative effects in real earnings management. The implications of the director index might be limited. With a more complete establishment of the director quality index, future studies can apply this index to investigate how director characteristics affect a firm's policies such as risky investments and the leverage decision under other settings or other emerging economies like Taiwan, and so on. Finally, due to the availability of the data regarding the director and supervisor professionalism and service, our sample period only covers a 5-year period. The time span is short and might somewhat limit the generalizability of our empirical results because real earnings management potentially imposes greater long-term costs on shareholders. A further exploration covering longer sample periods to examine the endogeneity problems in the empirical analysis of real earnings management could open the way to future analysis.

Nevertheless, our findings provide empirical evidence suggesting that the characteristics of the board members can be used as a valuable measure of director quality and shed light on the importance of the quality of the composition

of the board of directors and ownership structure in mitigating opportunistic real earnings management behavior. Investors can potentially employ our findings in evaluating the effectiveness of board members. Our findings also provide implications for policymakers who aim to improve the corporate governance practices of listed firms and to protect the interests of shareholders. These results also have wider implications for the ongoing demand for reforms in the composition of the board of directors and institutional ownership.

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