Outside Director Equity Compensation and the Quality of Analyst Earnings Forecasts

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Abstract

Purpose: This article investigates how outside directors' equity compensation affects the quality of analyst earnings forecasts.

Design/methodology/approach: The authors implement firm clustered OLS regression with year, quarter, and industry dummies since there may exist biases from firm, year, quarter, and industry specific characteristics.

Findings: Using 7,159 firm-year compensation data from ExecuComp, the authors find that the quality of analyst earnings forecasts improves when the proportion of equity compensation awarded to outside directors increases. They also separate equity compensation into stock and option. Their results show consistent improvement: more accurate and less dispersed analyst earnings forecasts. Overall, the findings suggest that the quality of analyst earnings forecasts is better when outside directors are compensated with equity compensation.

Research limitations/implications: This study provides empirical evidence of benefit from equity compensation of outside directors in line with existing compensation studies in accounting and finance literature. Unlike a majority of the extant studies, this study examines how the composition of director compensation affects the quality of information which financial analysts produce. Consistent with an argument that equity compensation aligns the interests, outside directors with more equity compensation tend to provide financial information with better quality, the authors document that analysts are likely to provide more accurate and less disperse information.

Practical implications: For and board members, this study offers an implication that equity compensation could contribute to enhancing their firms' information environment. In addition, analysts could improve their forecasting performance by following firm monitored by outside directors remunerated with equity compensation. For investors who put much emphasize on the quality of firms' financial information, the use of equity compensation can be a useful criterion in their investment decision.

Originality/value: This study provides empirical evidence of benefit from equity compensation in line with compensation studies in accounting and finance literature. Therefore, equity compensation can be a useful criterion in their decision makings for various parties, including analysts, regulators, and individual investors.

Keywords: outside director, equity compensation, analyst earnings forecasts

1. Introduction

In corporations, separation of ownership and management gives rise to information asymmetry between managers and shareholders, which inevitably results in agency problem. As a mechanism for controlling the agency problem, board of directors are nominated to make corporate decisions and oversee management on behalf of shareholders. Academic research has explored which characteristics of the board are associated with strong corporate governance and contribute to reducing the agency problem (Carcello et al., 2006; Vafeas, 1999; Yermack, 1996). Among various board characteristics, we focus on outside directors and equity compensation awarded to outside directors.

Outside directors play a crucial role in establishing sound corporate governance. Since outside directors are less dependent of CEOs compared to the other board members, they are able to monitor management effectively.

Adequate oversight of management can alleviate the information asymmetry between managers and shareholders resulting in a decrease in managerial opportunistic behaviors.

However, outside directors are also delegates of shareholders. This agent and principal relationship can bring about another type of agency problem between outside directors and shareholders. For example, it is conceivable that outside directors might collude with managers and engage in opportunistic activities even though their decisions would impair shareholders' wealth (Brick et al., 2006). Therefore, motivating outside directors to fulfill their monitoring roles faithfully is essential to the establishment of strong corporate governance. Equity compensation could serve as a remedy for this type of agency problem. Equity compensation encourages outside directors to perform their roles in pursuit of shareholders' wealth by aligning the interest of outside directors (agents) with that of shareholders (principals). Perry (2000) documents that firms which compensate outside directors with more amount of equity are more likely to fire their CEOs when they suffer from poor financial performance. Ryan and Wiggins (2004) provide empirical evidence that independent directors with bargaining advantage over the management are awarded with more equity compensation. Linn and Park (2005) also illustrate a positive relation between investment opportunities of the firms and amounts of equity compensation for their outside directors. Taken all together, firms with identical board structures in terms of the proportion of outside directors, board size, and the existence of financial expertise could have different levels of monitoring effectiveness depending on how much the outside directors are incentivized by equity compensation. Outside directors paid with more equity are inclined to monitor their managers more effectively and rigorously.

According to above discussion, we examine whether equity compensation for outside directors has an evident effect on the quality of analyst earnings forecast. We argue that strong corporate governance improves information environment around firms by reducing information asymmetry and preventing managerial opportunistic behaviors. Thus, we test whether the proportion of equity compensation to total compensation, as a proxy for sound governance mechanism, affects the quality of analyst earnings forecasts. We find that the proportion of equity compensation granted to outside directors is negatively associated with analyst forecast error and dispersion indicating an improvement in the quality of analyst earnings forecasts. For the sensitivity tests, we decompose equity compensation into stocks and options and test the relationship between analyst forecast quality and the proportions of stock and option compensation each. The results consistently support our hypotheses that interest alignment between outside directors and shareholders enhances corporate governance, and thereby improves the quality of analyst earnings forecasts.

Our findings contribute to the extant studies in two ways. First, we provide evidence of a link between the compensation structure of outside directors and analyst earnings forecasts. This is important because investors heavily rely on analyst earnings forecasts in their decision making and, for this reason, analyst earnings forecast is one of the important issues in accounting research. (Note 1) Second, this study complements the prior literature that investigates the relationship between corporate governance and analyst earnings forecasts, such as Byard et al. (2006) and Gul et al. (2013). They find that the proportion of outside directors and the percentage of the ownership of outside directors are associated with the quality of analyst earnings forecasts. By presenting the relationship between a specific compensation structure for outside directors and the effectiveness of their role, we extend the existing studies.

2. Literature Review and Hypotheses Development

2.1 Director Equity Compensation

Prior research focuses on managers' equity compensation and its implication on firm value. Findings from the previous studies support the influence of equity compensation on interest alignment between managers and shareholders. As managers possess more equity, their interests are prone to be better aligned with those of the shareholders. Bergstresser and Phillippon (2006) find that CEOs with more equity compensation are more concerned about earnings of their firms. Nagar et al. (2003) document that managers with more equity compensation tend to improve the quality of voluntary disclosure due to interest alignment between managers and shareholders. Furthermore, Armstrong et al. (2010) investigate how the CEOs' equity incentives are linked to accounting irregularities.

Researchers also turned their eyes to the compensation structure of outside directors. Perry (2000) finds that CEOs are more likely to be dismissed following bad performance when outside directors are compensated with more equity. Ryan and Wiggins (2004) suggest that firms with strong boards tend to award directors more equity compensation for the purpose of interest alignment. Cordeiro et al. (2005) and Fich and Shivdasani (2005) demonstrate that director equity compensation is positively associated with firm performance. Cordeiro et al. (2005) find that director equity compensation increases future firm performance and Fich and Shivdasani (2005)

state that director equity compensation improves firm value by fulfilling the interest alignment.

Besides the equity compensation, there are other interesting findings regarding director compensation. Adams and Ferreira (2008) examine that directors are more likely to attend the meetings when they receive a larger amount of meeting fees (albeit negligible amounts compared to directors' total compensation) and Engel et al. (2010) find that audit committee members demand more strict monitoring by the external auditors when they receive more cash retainers and total compensation, which is an evidence of enhancing monitoring effectiveness by director compensation.

2.2 Corporate Governance and Firms' Informational Environment

Firms that maintain effective governance mechanism exhibit better financial reporting quality. First, since managers' opportunistic behaviors (e.g., earnings management) are mitigated under strong corporate governance, earnings quality is likely to be superior for firms with sound control mechanism. Beasley (1996) find that firms with strong governance is less likely to commit financial statement fraud. Dechow et al. (1996) document that strong corporate governance is negatively associated with earnings management. Second, firms with strong governance tend to be actively engaged in disclosure activities. Eng and Mak (2003) examine whether ownership structure and board composition are associated with the level of voluntary disclosure. They find that lower managerial ownership and significant government ownership are associated with an increase in voluntary disclosure. It is also found that in firms with more effective board and audit committee structures, managers are more inclined to generate or update an earnings forecast, and their forecast is more likely to be accurate and induce a more favorable investor response (see Ajinkya et al., 2005; Karamanou & Vafeas, 2005). More recently, Kim et al. (2014) emphasizes that equity compensation for outside directors enhances managers' voluntary disclosure quality improving the corporate information environment.

2.3 Equity Compensation to Outside Directors and the Quality of Analyst Earnings Forecasts

Equity compensation for outside directors reinforces the effectiveness of their monitoring activities by aligning the interests of outside directors with those of shareholders. Enhanced corporate governance that is achieved by providing more equity compensation to outside directors leads to an increase in the quality of financial reporting (Kim et al., 2014). With better quality of financial information about companies that they follow, financial analysts are likely to issue more accurate and less dispersed earnings forecasts.

Empirical evidence supports a positive relationship between the level of corporate governance and the quality of analyst earnings forecasts. Byard et al. (2006) find that board effectiveness is positively related to the accuracy of security analysts. Bhat et al. (2006) focus on country-level governance factors and find that analysts provide more accurate forecasts in countries with more transparent governance structure. Their results also emphasize the importance of governance in improving the information environment. Gul et al. (2013) argue that gender-diverse boards have more effective monitoring with the risk-averseness of female directors and this monitoring effectiveness helps achieving more accurate analyst earnings forecasts.

Based on above discussion, we expect a positive association between the amount of equity compensation given to outside directors and the quality of analyst earnings forecasts. Therefore, our hypotheses are as follows:

Hypothesis 1a. Analyst forecast error decreases, ceteris paribus, when the proportion of outside directors' equity compensation increases.

Hypothesis 1b. Analyst forecast dispersion decreases, ceteris paribus, when the proportion of outside directors' equity compensation increase.

3. Methodology

We use analyst earnings forecast error and dispersion as proxies for the quality of analyst earnings forecasts. Our samples include quarterly forecasts to increase the number of observations and to reduce the influence of analyst forecast horizon on the forecast performance. Analyst forecast error (*AFERROR*) is defined as the absolute value of the difference between actual earnings per share and the analyst forecast consensus during the quarter reported by *I/B/E/S*. Analyst forecast dispersion (*AFDISP*) is the standard deviation of individual analysts' most recent forecasts prior to the earnings announcement. In calculating *AFERROR* and *AFDISP*, we only use most recently updated earnings forecast per analyst to alleviate the impact from the analyst's information availability according to varying forecast horizons. We divide both *AFERROR* and *AFDISP* by quarter-end stock prices.

We test for *AFERROR* and *AFDISP* with the following research model:

$$AFERROR \text{ (or } AFDISP) = \beta_0 + \beta_1 DEQ + \beta_2 CEOEQ + \beta_3 CEOCHAIR + \beta_4 OUTSIDE + \beta_5 MGROWN + \beta_6 INSTOWN + \beta_7 PROBLEM + \beta_8$$
$$SURPRISE + \beta_9 NEGSURPRISE + \beta_{10} LOSS + \beta_{11} NEGSPECIAL + \beta_{12} HORIZON + \beta_{13} LagAFERROR \text{ (or } LagAFDISP) + \beta_{14} FOLLOW +$$
$$\beta_{15} RET + \beta_{16} SIZE + YearFE + QuarterFE + IndustryFE \hspace{3cm} (1)$$

Our panel data might cause inter-temporal correlations due to the possible persistency over multiple years in *AFERROR* or *AFDISP*. Also, similar characteristics in the firms within the same industry might create cross-sectional correlation of errors and dispersions as well. To address these concerns, we control year dummies (*Year FE*), quarter dummies (*Quarter FE*), and Fama-French industry dummies (*Industry FE*) in our firm cluster-robust regression model.

Since effective governance with strong board of directors reduces analyst forecast error and dispersion, we consider the governance related variables, *CEOCHAIR*, *OUTSIDE*, *MGROWN*, *INSTOWN*, and *PROBLEM* from prior literature (Bhat et al., 2006; Byard et al., 2006; Gul et al., 2013). We include several variables from prior literature to control earnings characteristics that affect forecast error and dispersion. Since large earnings changes are difficult to anticipate than small changes (Heflin et al., 2003; Kross et al., 1990; Lang & Lundholm, 1996), we include changes in quarterly earnings scaled with the ending quarter stock price (*SURPRISE*). Furthermore, for firms with declining or negative earnings and negative special items, analysts have large errors and dispersion in their forecasts due to the transitory components in the earnings. Therefore, we include the dummy variables *NEGSURPRISE*, 1 if a firm's earnings are smaller than the earnings in previous quarter and 0 otherwise, and *LOSS*, 1 if a firm's earnings are negative, and 0 otherwise. We also include *NEGSPECIAL*, which is defined as the absolute value of special items deflated by total assets if negative, and 0 otherwise. Later forecasts are more likely to be accurate than earlier forecasts (Clement, 1999; Heflin et al., 2003; Kross et al., 1990), thus we include the log of the average number of days between analyst forecast date and the earnings announcement date (*HORIZON*).

In addition, we consider variables to control firm characteristics. When the firms are followed by more analysts, analyst forecasts tend to be more accurate and less dispersed with improved information environment. To capture this, we include a variable for analyst following, total number of analysts who issued earnings forecasts in the same quarter (*FOLLOW*). Analysts' behavior regarding past stock price changes is different (Gleason & Lee, 2003), we consider buy-and-hold return for the current quarter (*RET*). Company size can be a proxy for the amount of information that is available to the analysts or can be a proxy for business complexity, we control *SIZE*, the market capitalization of a company, in our model.

4. Data

Our sample consists of firms from *Compustat* database for the years 2006 to 2012. *Compustat* (*ExecuComp*) provides annual compensation data for each non-executive director after 2006, (Note 2) as well as other financial data for our dependent and control variables. Since *ExecuComp* does not provide director type (Note 3) we manually match *ExecuComp* and *RiskMetrics* by company and director names. Based on this procedure, we identify the composition of board of directors and the compensation structure of each outside director. We also examine CEOs' compensation structure and calculate CEOs' equity portion of total compensation.

After all variables are considered, our final sample comprises 7,159 firm-year samples and 23,300 firm-quarter samples from the intersection of the *Compustat* (*ExecuComp*), *RiskMetrics*, *CRSP*, and *I/B/E/S* databases. Panel A in Table 1 reports descriptive statistics on the variables. Since some information regarding the compensation and governance characteristics is disclosed annually, we report 7,159 firm-year observations for these variables. However, we utilize firm-quarter observations when available and our data has 23,300 firm-quarter observations for *AFERROR* test and 22,457 *AFDISP* test. (Note 4).

The distribution of *AFERROR* and *AFDISP* is consistent with prior literature (Byard et al., 2006; Gul et al., 2013). Mean (median) of *AFERROR* is 0.0039 (0.0016), which means that the difference between analysts forecasts consensus and actual earnings is about 0.39 percent (0.16 percent) of the stock price. In the same manner, mean (median) of *AFDISP* implies that analyst earnings forecasts are dispersed about 0.20 percent (0.09 percent) of the stock price. On average, each outside director receives, 37 percent of stock compensation, 16 percent of option compensation, in total 53 percent of equity compensation compared to total compensation. The amount reaches about $108,000. CEOs are rewarded about 27 percent of stock and 19 percent of option. In sum, they receive 46 percent of equity compensation compared to total compensation and the value of their equity compensation is $3,416,000, which is about 32 times of that of an outside director ($3,416,000/$108,000=31.63 times). We also estimate CEO delta following Core and Guay (2002), but we cannot calculate directors' delta since number of stocks or options are not readily available.

Our corporate governance related variables (*CEOCHAIR*, *OUTSIDE*, *MGROWN*, *INSTOWN*, and *PROBLEM*) have similar distribution to prior literature, indicating 67 percent of CEOs also hold chairman position, 72 percent of outside directors are present in a board, 3.11 percent of stocks are owned by top five executives, 74.09 percent of stocks are owned by institutional investors, and 11 percent of firms have at least one director with attendance problem. (Note 5) In addition, our firm characteristic variables show comparable distribution with previous studies. Average earnings surprise (*SURPRISE*) compared to previous quarter is 0.98 percent of the stock price while the likelihood of negative surprise (*NEGSURPRISE*) is 34.51 percent. 8.06 percent of our sample firms report a loss (*LOSS*) and the amount of negative special items (*NEGSPECIAL*) is 0.35 percent of total assets. With our mean value of forecast horizon (*HORIZON*), we measure how early the analyst forecast announced before the actual earnings reported. Mean value of *HORIZON* indicates that analysts made forecasts 60 days before the actual earnings. Generally, about 10 analysts (= $e^{2.2871}$) are following a company (*FOLLOW*), firms are achieving approximately 2.83 percent of buy-and-hold returns for the quarter (*RET*), and the market value of the equity is around $2.3536 billion (*SIZE*) in our sample.

Panel B in Table 1 shows correlations between the properties of analyst earnings forecasts and equity compensation variables. We have negative correlation between outside director's equity compensation (*DSTOCK*, *DOPTION*, and *DEQ*) and analyst earnings forecast error at one percent levels and this suggests that equity-based compensation, stock, option, or altogether, of outside directors is negatively related to analyst forecast error. Our negative correlation between director's equity compensation and analyst earnings forecast dispersion also implies that equity compensation is negatively associated with analyst forecast dispersion. Above findings indicate that director's equity compensation enhances the information environment for the analysts. We have similar results for CEO equity compensation (*CEOSTOCK*, *CEOOPTION*, *CEOEQ*, and *CEODELTA*). Negative correlations between measures for CEO equity compensation and analyst forecast metrics can be interpreted as a positive influence of CEO equity compensation on analyst forecast quality, which is consistent with the interest-alignment effect of equity compensation. However, our univariate analysis only explains the association between director's equity compensation and analyst forecast quality without controlling other possible relevant factors, so we further examine our hypotheses with our regression model by considering other control variables at the same time and find the implication of director equity compensation on analyst earnings forecasts.

Table 1. Summary statistics

Panel A. Descriptive statistics

Variable	N	Std.	P25	Mean	Median	P75
AFERROR	23,300	0.0086	0.0007	0.0039	0.0016	0.0036
AFDISP	22,457	0.0043	0.0004	0.0020	0.0009	0.0018
DSTOCK	7,159	0.2400	0.1710	0.3700	0.4200	0.5500
DOPTION	7,159	0.2400	0.0000	0.1600	0.0000	0.2900
DEQ	7,159	0.2000	0.4460	0.5300	0.5500	0.6600
Mean equity amount per outside director ($1,000)	7,159	80	57	108	96	137
CEOSTOCK	7,159	0.2200	0.0720	0.2700	0.2500	0.4200
CEOOPTION	7,159	0.2000	0.0000	0.1900	0.1600	0.3000
CEOEQ	7,159	0.2300	0.3300	0.4600	0.4900	0.6300
Equity amount for CEO ($1,000)	7,159	3,838	860	3,416	2,140	4,571
CEODELTA	7,159	0.2262	0.1425	0.3139	0.2570	0.4300
CEOCHAIR	7,159	0.4700	0.0000	0.6700	1.0000	1.0000
OUTSIDE	7,159	0.1600	0.6250	0.7200	0.7500	0.8500
MGROWN	7,159	6.3400	0.2600	3.1100	0.7500	2.2800
INSTOWN	7,159	19.5000	63.6410	74.0900	77.3500	88.4000
PROBLEM	7,159	0.3100	0.0000	0.1100	0.0000	0.0000
SURPRISE	23,300	0.0218	0.0017	0.0098	0.0036	0.0085
NEGSURPRISE	23,300	0.4754	0.0000	0.3451	0.0000	1.0000
LOSS	23,300	0.2722	0.0000	0.0806	0.0000	0.0000
NEGSPECIAL	23,300	0.0148	0.0000	0.0035	0.0000	0.0018
HORIZON	23,300	0.4220	3.9185	4.0965	4.2054	4.3924
LagAFERROR	23,300	0.0075	0.0007	0.0036	0.0015	0.0035
LagAFDISP	22,457	0.0038	0.0004	0.0018	0.0008	0.0017
FOLLOW	23,300	0.6466	1.7918	2.2871	2.3026	2.7726
RET	23,300	0.2107	-0.0953	0.0283	0.0280	0.1414
SIZE	23,300	1.5128	6.6462	7.7637	7.5955	8.7150

Panel B. Correlations between the properties of analyst earnings forecasts and equity compensation variables

	AFERROR	*AFDISP*
Variable		
DSTOCK	-0.0442***	-0.0308***
DOPTION	-0.0356***	-0.0350***
DEQ	-0.0995***	-0.0822***
CEOSTOCK	-0.0246***	-0.0061
CEOOPTION	-0.0115*	-0.0006
CEOEQ	-0.0345***	-0.0057
CEODELTA	-0.1503***	-0.1399***

5. Results

5.1 Properties of Analyst Earnings Forecasts

Table 2 reports the results of OLS regression to test the effect of outside director's equity compensation on analyst earnings forecasts. We use analyst forecast error (*AFERROR*) and dispersion (*AFDISP*) as our dependent variables. In *AFERROR* and *AFDISP* tests, we have similar results on the variables. In consistent with the univariate correlation test, we have negative coefficients on *DEQ* meaning director equity compensation improves the quality of analyst earnings forecasts. Positive *CEOEQ* coefficient in *AFDISP* test suggests that analyst forecasts are more dispersed when CEOs are rewarded with more equity compensation, which is inconsistent with our correlation analysis.

For the control variables, negative coefficients on *INSTOWN* reflect institutional investors' monitoring role and positive coefficients on *SURPRISE*, *NEGSURPRISE*, *LOSS*, and *NEGSPECIAL* explain that analysts are likely to have more accurate and less dispersed forecasts when the EPS is less volatile, the firm recognizes positive earnings, and the firm has less negative special items. *HORIZON* is positively associated with *AFERROR* since earlier forecasts are less accurate among the analysts. *RET* captures analysts' behavior regarding past stock price changes and our results find analysts overreact past price changes. Large company (*SIZE*) provides more information to the market so the analysts can produce more accurate and less dispersed forecasts.

In summary, both types of equity compensation to outside directors influence analyst earnings forecast quality, consistent with our predictions. These results suggest that equity compensation to outside directors improve the quality of analyst earnings forecast supporting our hypotheses.

Table 2. Regression results for properties of analyst earnings forecasts

	AFERROR		*AFDISP*	
Variable	Coeff.	(t-stat.)	Coeff.	(t-stat.)
Intercept	-0.0029	(3.35)***	-0.0033	(6.42)***
DEQ	-0.0007	(-3.17)***	-0.0004	(-3.15)***
CEOEQ	-0.0000	(0.18)	-0.0004	(3.01)***
CEOCHAIR	-0.0000	(-0.41)	-0.0000	(-0.50)
OUTSIDE	-0.0013	(2.49)**	-0.0008	(3.11)***
MGROWN	-0.0000	(1.41)	-0.0000	(1.19)
INSTOWN	-0.0000	(-2.88)***	-0.0000	(-3.69)***
PROBLEM	-0.0002	(-0.91)	-0.0001	(-1.52)
SURPRISE	-0.2316	(18.34)***	-0.0971	(14.28)***
NEGSURPRISE	-0.0002	(-2.88)***	-0.0001	(3.38)***
LOSS	-0.0032	(9.08)***	-0.0018	(8.37)***
NEGSPECIAL	-0.0304	(4.24)***	-0.0103	(2.86)***
LagAFERROR	-0.0257	(1.22)		
LagAFDISP			-0.1525	(6.48)***
HORIZON	-0.0004	(3.66)***	-0.0003	(-4.56)***
FOLLOW	-0.0002	(-1.52)	-0.0002	(3.23)***
RET	-0.0009	(-3.02)***	-0.0010	(-6.59)***
SIZE	-0.0003	(-6.23)***	-0.0002	(-6.62)***
Firm Clustering, Year Dummies, Quarter Dummies, and Industry Dummies included				
Adj. R^2	0.5310		0. 4872	
N	23,300		22,457	

Notes. The variables are defined as in Appendix 1. *t*-statistics in parentheses are based on robust standard errors clustered at firm levels. *, **, and *** indicate the significance level at .10, .05, and .01, respectively.

5.2 Stock vs. Option Compensation

Different types of equity compensation may affect the forecasts quality in different ways (Bryan *et al*. 2000). So, directors may be sensitive to whether their equity compensation is in the form of stock or option. Hence, we conduct further analysis separating the two types of equity compensation in Table 3. In our replication, we obtain coefficients -0.0008 for stocks and -0.0008 for options (*AFERROR* test), and -0.0004 for stocks and -0.00005 for options (*AFDISP* test). Hence, we find that both types of equity compensation to outside directors (i.e., stocks and options) significantly improve the analyst earnings forecast quality.

Table 3. Regression results with the portions of stock and option

	AFERROR		*AFDISP*	
Variable	Coeff.	(t-stat.)	Coeff.	(t-stat.)
Intercept	-0.0030	(3.43)***	-0.0033	(6.43)***
DSTOCK	-0.0008	(-2.84)***	-0.0004	(-2.46)**
DOPTION	-0.0008	(-3.17)***	-0.0005	(-3.46)***
CEOSTOCK	-0.0001	(-0.39)	-0.0004	(2.53)**
CEOOPTION	-0.0003	(0.96)	-0.0004	(2.84)***
CEOCHAIR	-0.0000	(-0.43)	-0.0000	(-0.52)
OUTSIDE	-0.0013	(2.49)**	-0.0008	(3.01)***
MGROWN	-0.0000	(1.40)	-0.0000	(1.24)
INSTOWN	-0.0000	(-2.89)***	-0.0000	(-3.67)***
PROBLEM	-0.0002	(-0.89)	-0.0001	(-1.48)
SURPRISE	-0.2315	(18.33)***	-0.0971	(14.26)***
NEGSURPRISE	-0.0002	(-2.93)***	-0.0001	(3.35)***
LOSS	-0.0032	(9.05)***	-0.0018	(8.36)***
NEGSPECIAL	-0.0305	(4.26)***	-0.0103	(2.86)***
LagAFERROR	-0.0256	(1.22)		
LagAFDISP			-0.1524	(6.47)***
HORIZON	-0.0004	(3.64)***	-0.0003	(-4.55)***
FOLLOW	-0.0002	(-1.52)	-0.0002	(3.24)***
RET	-0.0009	(-3.02)***	-0.0010	(-6.59)***
SIZE	-0.0004	(-6.22)***	-0.0002	(-6.62)***
Firm Clustering, Year Dummies, Quarter Dummies, and Industry Dummies included				
Adj. R^2	0.5311		0. 4873	
N	23,300		22,457	

Notes. The variables are defined as in Appendix 1. *t*-statistics in parentheses are based on robust standard errors clustered at firm levels. *, **, and *** indicate the significance level at .10, .05, and .01, respectively.

5.3 Alternative Measures of Equity Compensation

We use the median of each outside director's ratio of equity compensation to total compensation as a proxy for equity compensation of outside director. For sensitivity, we use the mean of each director's ratio of equity compensation to total compensation and the ratio of sum of each outside director's equity compensation to sum of each member's total compensation. The untabulated results are similar to those reported before. For CEO's equity compensation, we use the ratio of CEO's equity compensation to total compensation. For sensitivity, we use delta based on Core and Guay (2002). Delta represents the change in CEO's total compensation come from a one percentage point change in the value of the stock price. In our replication of Table 2 using delta as a proxy for CEO equity compensation, we still obtain negative coefficients on *DEQ*. Our alternative measures of outside director's equity compensation and CEO's equity compensation do not alter our results.

Table 4. Regression results with CEO delta

Variable	AFERROR		AFDISP	
	Coeff.	(t-stat.)	Coeff.	(t-stat.)
Intercept	-0.0027	(3.11)***	-0.0031	(6.06)***
DEQ	-0.0007	(-2.86)***	-0.0003	(-2.40)**
CEODELTA	-0.0003	(-1.19)	-0.0001	(-1.07)
CEOCHAIR	-0.0000	(-0.23)	-0.0000	(-0.53)
OUTSIDE	-0.0013	(2.49)**	-0.0009	(3.48)***
MGROWN	-0.0000	(1.55)	-0.0000	(1.07)
INSTOWN	-0.0000	(-2.86)***	-0.0000	(-3.63)***
PROBLEM	-0.0002	(-0.89)	-0.0001	(-1.49)
SURPRISE	-0.2315	(18.33)***	-0.0970	(14.24)***
NEGSURPRISE	-0.0002	(-2.98)***	-0.0002	(3.62)***
LOSS	-0.0032	(9.04)***	-0.0018	(8.41)***
NEGSPECIAL	-0.0305	(4.27)***	-0.0107	(2.97)***
LagAFERROR	-0.0260	(1.24)		
LagAFDISP			-0.1527	(6.47)***
HORIZON	-0.0004	(3.77)***	-0.0003	(-4.46)***
FOLLOW	-0.0002	(-1.48)	-0.0003	(3.66)***
RET	-0.0009	(-3.00)***	-0.0010	(-6.61)***
SIZE	-0.0003	(-5.50)***	-0.0002	(-5.73)***
Firm Clustering, Year Dummies, Quarter Dummies, and Industry Dummies included				
Adj. R^2	0.5312		0. 4870	
N	23,300		22,457	

Notes. The variables are defined as in Appendix 1. *t*-statistics in parentheses are based on robust standard errors clustered at firm levels. *, **, and *** indicate the significance level at .10, .05, and .01, respectively.

6. Conclusions

This study investigates the association between the amount of equity compensation granted to outside directors and the quality of analyst earnings forecasts. As a motivating mechanism that aligns the interests of outside directors with shareholders' welfare, equity compensation facilitates effective control over management and thus enhances corporate governance. Based on an argument that the establishment of sound corporate governance contributes to fostering an improvement of financial reporting quality, we hypothesize that the quality of analyst earnings forecasts is likely to be better in firms that compensate outside directors with more amount of equity. We find that the proportion of equity compensation for outside directors is negatively associated with analyst forecast error and dispersion. The results hold after controlling for conventional corporate governance measures and other control variables that possibly affect the analyst earnings forecasts. The results are also robust to additional tests using the mean of the equity ratio instead of median, and separating equity compensation for outside directors into stock and options.

Overall, our findings support the governing role of outside directors and the moderating effect of equity compensation on the relationship between outside directors and corporate governance. Equity compensation augments monitoring role of outside directors. Furthermore, this study also provides supplementary evidence that sound corporate governance mechanism possibly enriches information environment around companies affecting the quality of analyst earnings forecasts.

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Notes

Note 1. Considering the fact that more firms are incentivizing their directors with equity compensation, our results are even more meaningful.

Note 2. SEC revised disclosure requirements including executive and director compensation, effective December 15, 2006.

Note 3. Directors are classified as one of the following: *inside*, *gray*, or *outside*. An *inside* director holds a director position in a firm and is an employee of the firm at the same time. A *gray* director holds a director position in a firm and has a special relationship with the CEO. Since a gray director is usually a former employee, current commercial partner, or family member of the CEO, he/she may be easily influenced by the CEO. A director who does not meet either of these descriptions is called an *outside* director; he/she is independent of the CEO.

Note 4. We need at least two analysts forecasts to measure the dispersion of analyst earnings forecasts, so we have less observations in *AFDISP* test than in *AFERROR* test.

Note 5. A director have attendance problem if the director's attendance rate is below 75% of total meetings.

Appendix 1. Variable definitions

Variable	Description
AFERROR	Mean of |Analyst' forecast –actual earnings|/ stock price at the end of a current quarter
AFDISP	Standard deviation of Analysts' forecasts/ stock price at the end of a current quarter
DSTOCK	The mean of ratios of the board's outside directors' stock compensation to total compensation
DOPTION	The mean of ratios of the board's outside directors' option compensation to total compensation
DEQ	The mean of ratios of the board's outside directors' equity-based (stock and option) compensation to total compensation
CEOSTOCK	Ratio of the CEO's stock compensation to total compensation
CEOOPTION	Ratio of the CEO's option compensation to total compensation
CEOEQ	Ratio of the CEO's equity (stock and option) compensation to total compensation
CEOCHAIR	1 if CEO also holds the chairman of the board, 0 otherwise
OUTSIDE	Ratio of outside directors in the board
MGROWN	Ownership by highest paid top 5 managers
INSTOWN	Ownership by institutional investors
PROBLEM	1 if at least one outside director caused attendance problem: attendance rate is below 75% of total meetings
SURPRISE	This quarter's actual earnings minus previous quarter's actual earnings divided by stock price at the end of a current quarter
NEGSURPRISE	1 if *SURPRISE* is negative, 0 otherwise

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LOSS	1 if actual earnings is negative, 0 otherwise
NEGSPECIAL	|Special items|/total assets if special items is negative, 0 otherwise
HORIZON	Log of Average days between analysts' forecast announcing dates and actual earnings reporting dates
LagAFERROR	*AFERROR* in the previous year same quarter
LagAFDISP	*AFDISP* in the previous year same quarter
FOLLOW	Log number of analysts' followings for the quarter
RET	Buy-and-hold returns of the stock for the quarter
SIZE	Log of market value of equity