Equity-Based Compensation For Outside Directors And Cost Of Equity Capital

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ABSTRACT

This study provides evidence on the association between equity-based compensation for outside directors and the implied cost of equity capital. Based on the premise that equity-based compensation for outside directors better aligns the interests of the directors with those of shareholders, we investigate whether the more equity-based compensation is granted to outside directors, the lower cost of equity capital firms enjoy. We find a negative relationship between the proportion of equity-based compensation to total compensation for outside directors and the cost of equity capital. Our findings suggest that equity-based compensation for outside directors, by motivating the directors to play their monitoring role more faithfully, reduces agency risks resulting in the lower cost of equity capital.

Keywords: Equity-Based Compensation; Cost of Equity Capital; Information Asymmetry; Corporate Governance

1. INTRODUCTION

Firms inherently suffer from agency problems between shareholders and managers due to the separation of ownership and control (Jensen & Meckling, 1976). Specifically, the agency problems can be classified into two separate problems. On one hand, managers have incentives to make decisions pursuing their own interests against shareholders' interests, which results in a moral hazard problem. On the other hand, shareholders cannot figure out the true economic value of the firm, which creates an adverse selection problem (Ashbaugh et al., 2009b). Since both the problems expose shareholders to a greater agency risk, equity investors rationally demand a higher premium for firms with higher agency risk and raise the cost of equity capital.

However, firms with effective governance mechanism experience lesser degree of agency problems. Strong corporate governance restricts managers' opportunistic behavior and reduces information asymmetry mitigating agency problems. Thus, it is apparent that corporate governance has an influence on the cost of equity capital via decreasing agency risk. Ample studies have investigated the kinds of governance attributes which affect the cost of equity capital (e.g., Botosan, 1997; Botosan & Plumlee, 2002; Bhojraj & Sengupta, 2003; Francis et al., 2004; Attig et al., 2008; Ashbaugh et al., 2009a; Ashbaugh et al., 2009b). Among various governance attributes, we focus on equity-based compensation for outside directors for two reasons. First, outside directors are important constituents of strong corporate governance. The independence of outside directors from managements allows the directors to effectively monitor managers' opportunistic behavior (e.g., Klein, 2002; Ajinkya et al., 2005). Second, equity-based compensation given to outside directors improves the effectiveness of outside directors in monitoring managerial behaviors. Since outside directors are agents of shareholders as well, it is also possible that another type of agency problem between outside directors and shareholders exists. Equity-based compensation to outside directors can play a crucial role as a remedy for such type agency problem. It motivates outside directors to more rigorously monitor the managements of their firm by better aligning the interests of outside directors with those of shareholders. Consequently, improved corporate governance decreases agency risk and cost of equity capital.

In this study, we examine the relationship between the amount of equity-based compensation granted to outside directors and cost of equity capital. Using six specific measures and two composite measures of the cost of equity capital, we find that the proportion of equity-based compensation to total compensation is negatively

associated with the cost of equity capital. To test the sensitivity of our results to alternative measures of equity-based compensation amount, we use the average amount of equity-based compensation (equity amount), and also separate the amount of stock compensation and that of options. However, the relationship between equity-based compensation and the cost of equity capital is unaffected. Our results suggest that providing equity-based compensation to outside directors can constitute an effective governance mechanism which better aligns the interests between shareholders and outside directors. The results also imply that firms with stronger corporate governance enjoy lower cost of equity capital.

Our findings contribute to the extant studies in two ways. First, we provide a link between the compensation structure of outside directors and the cost of equity capital. We believe this evidence is meaningful because the cost of equity capital is one of the most frequently treated issues in academia, and equity-based compensation is recently attracting much more attention from accounting and finance researchers. Second, this study complements the prior literature that investigates the relationship between corporate governance and cost of equity capital. Rather than exploring the effect of general characteristics of outside directors on cost of equity capital, we extend their work by presenting evidence that a specific compensation scheme for outside directors affects cost of equity capital.

The remainder of the paper is organized as follows. The related research and the hypotheses are discussed in Section 2. In Section 3, I describe the sample and the research design. Section 4 presents the results, and I summarize the findings and conclude this study in Section 5.

2. RELATED LITERATURE AND PREDICTIONS

Shareholders delegate their decision rights and oversight roles to a board of directors to prevent the agency problems by managements. Previous studies have shown that board characteristics, such as the composition of a board and board meeting frequency, are related to the effectiveness of the board and thus to strong corporate governance (e.g., Yermack, 1996; Vafeas, 1999; Carcello et al., 2006). Going one step forward, many researchers turned their eyes to the types of directors, especially outside directors. Outside directors are considered to be independent in that they are not employees of the company and unaffiliated with it. The independence of outside directors from management enables them to effectively monitor CEO's opportunistic behavior against shareholders. Empirical literature documents that outside directors help firms build a solid corporate governance system and thereby reduce agency costs by restricting managers' opportunistic behaviors and decreasing information asymmetry. Klein (2002) documents that board independence, proxied by the percentage of outside directors in a board, is negatively associated with the extent to which firms manipulate their earnings. Ajinkya et al. (2005) also find that firms with more outside directors tend to issue more specific, accurate and less optimistically biased management forecast.

However, while outside directors can be the source of strong corporate governance, they can also generate another type of agency problems. For example, outside directors might collude with managers and engage in opportunistic activities pursuing their own interests even though the decision ruins the shareholders' wealth (e.g., Brick et al., 2006). As CEOs frequently sits on the nomination committee or exerts influence on the nomination process of outside directors, they might take advantage of the relationship to force outside directors to be on their side (Perry, 2000). Even worse, it is difficult for shareholders to directly monitor and control the behavior of outside directors. The board generally involves in setting its own compensation and deciding upon its own members' continuation of directorship through remuneration committee and nomination committee (Yermack, 2004). In addition, the performance of outside directors is evaluated by other board members and hard to quantify. Therefore, the performance evaluation of outside directors is subject to the discretion of other board members.

In the dearth of a direct mechanism for controlling the behavior of outside directors, equity-based compensation to outside directors can be a fundamental remedy for the agency problem between shareholders and outside directors. By allowing the interests of outside directors to be better aligned with those of shareholders, equity-based compensation incentivizes the directors to more faithfully fulfill their monitoring role on behalf of shareholders. Empirical studies provide evidence on the incentivizing role of equity-based compensation in alleviating agency problems caused by outside directors. Perry (2000) argues that CEOs will be more likely to get fired following bad performance when the outside directors are highly compensated with equity. Ryan and Wiggins

(2004) suggest a positive association between corporate governance and equity-based compensation for outside directors. That is, firms with strong boards compensate the directors with more equity-based compensation to align their objectives more closely with shareholders'. In addition, Linn and Park (2005) point out firms with more investment opportunities grant larger amounts of equity-based compensation to outside directors. Deutsch (2007) emphasizes that equity-based compensation for outside directors enhances firms' R&D investment. Fich and Shivdasani (2005) state that equity-based compensation helps align the incentives of outside directors and shareholders, thereby improving firm value. Likewise, Cordeiro et al. (2005) demonstrate that the equity-based compensation for directors is positively associated with future firm performance.

Another stream of research explores the relation between agency risk and the cost of equity capital. For example, Attig et al. (2008) assert a negative association between institutional ownership and cost of equity capital. Ashbaugh et al. (2009b) find firms with more independent directors and more board ownership are exposed to less agency risk, so they have a lower cost of equity capital. Botosan (1997), and Botosan and Plumlee (2002) prove a negative relation between disclosure quality and cost of equity capital. Francis et al. (2004) document that earnings transparency is negatively associated with cost of equity capital. Similarly, Hail and Leuz (2006) and Ashbaugh et al. (2009a) point out firms with a more extensive regulation environment have a lower cost of equity capital by reducing agency risks. Aggregately, empirical evidence supports the negative association between agency risk and the cost of equity capital.

In conclusion, by tying the interests of outside directors to those of shareholders, equity-based compensation granted to outside directors curtails the possibility of agency problems caused by outside directors as well as managers. The interest alignment allows firms to suffer from lesser degree of agency risk and thereby reduces the firms' cost of equity capital. Based on this reasoning, we hypothesize that the amount of equity-based compensation awarded to outside directors is negatively related to the cost of equity capital.

3. RESEARCH DESIGN

3.1 Sample and Data

Our sample consists of firms from *Compustat*, *Corporate Library*, *CRSP*, and *I/B/E/S* databases for the years extending from year 2006 to 2008. *Compustat* (*ExecuComp*) provides annual compensation data for each outside director after 2006 as well as other financial data. Directors are classified from *Corporate Library* as one of the following: inside, gray, or outside.¹ To fill in the data missing in the *Corporate Library* database, we hand-collect additional director type information from the proxy statements. We obtain the stock price information from the *CRSP* database. To compute implied cost of equity capital, earnings forecasts are acquired from the *I/B/E/S* database. We use median analysts' forecasts of *EPS* at year $t+1$ and at year $t+2$ (EPS_{it+1} and EPS_{it+2}), respectively.² We also find analysts' estimation of *EPS* long-term growth rate (*ltg*). If EPS_{it+2} is not available, then we infer EPS_{it+2} with EPS_{it+1} and *ltg*. After all variables are taken together, the final sample for the empirical analysis comprises 2,727 firm-year observations from the intersection of the *Compustat*, *Corporate Library*, *CRSP*, and *I/B/E/S* databases.³

3.2 Measures of Cost of Equity Capital

In this section, we give a short explanation of the eight measures of implied cost of equity capital that we calculated (*COE*). Following the extant literature, we use the models to measure implied cost of equity capital based on either the dividend discount model or the residual income model. In detail, we estimate six types of specifications and two types of composite measures to increase the validity and the credibility of the proxies. The first measure of cost of equity capital is R_{PE} , which reflects expected cum-dividend combination earnings for the subsequent two

¹ An inside director holds a director position in a firm and is also 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 satisfy either of these descriptions is called an independent outside director, and he (she) is independent of the CEO. We only consider independent directors in our analyses. We arrive at similar results when we include gray directors in our analyses.

² Mean value of analysts' forecasts shows similar results.

³ To handle outlier problems, we winsorize continuous variables at the 1% and 99% levels.

years. It is the inverse of the forward price-earnings ratio. We consider R_PE as a basic benchmark of implied cost of equity capital.

The next three measures are based on the dividend discount model (e.g., Ohlson & Juettner-Nauroth, 2005; Easton, 2004; Easton & Monahan, 2005). These measures use exactly the same model but differ in assumptions on dividend and earnings growth patterns.

$$P_{it} = \frac{EPS_{it+1}}{r} + \frac{EPS_{it+2} + r \times DPS_{it+1} - (1+r) \times EPS_{it+1}}{r \times (r - growth)} \quad (1)$$

In this equation, P_{it} is stock price at the year-end, $EPS_{it+\tau}$ ($DPS_{it+\tau}$) is a forecasted EPS (DPS) of year $t + \tau$ at year t and $growth$ is the expected growth rate of earnings. From this equation, we derive (1) R_PEG under the no dividend and zero growth rate assumptions ($DPS_{it+1} = 0$, $growth = 0$), (2) R_MPEG under the zero growth rate assumption ($growth = 0$), and (3) R_OJN by setting the growth rate to analysts' long-term growth rate ($growth = ltg$).

The other two measures are based on the residual income valuation model. These two values are from the same valuation model but are different in assuming the terminal horizon and future growth rates. In evaluating cost of equity capital, R_CT , we assume that earnings will expand at a rate of analysts' consensus (ltg) until year $t + 5$ and be constant thereafter.⁴ R_GLS is from Gebhardt et al. (2001). In this model, ROE is presumed to decline at a certain rate from year $t + 3$ to year $t + 12$ and then will be uniform forever.⁵

Table 1: Cost of Equity Capital Calculation

Variables	Valuation Models	Descriptions
R_PE	$P_{it} = \frac{EPS_{it+1} + R_PE \times DPS_{it+1} + EPS_{it+2}}{(1 + R_PE)^2 - 1}$	
R_PEG	$P_{it} = \frac{EPS_{it+2} - EPS_{it+1}}{R_PEG^2}$	
R_MPEG	$P_{it} = \frac{EPS_{it+2} + R_MPEG \times DPS_{it+1} - EPS_{it+1}}{R_MPEG^2}$	
R_OJN	$P_{it} = \frac{EPS_{it+1}}{R_OJN} + \frac{EPS_{it+2} + R_OJN \times DPS_{it+1} - (1 + R_OJN) \times EPS_{it+1}}{R_OJN \times (R_OJN - ltg)}$	
R_CT	$P_{it} = BPS_{it} + \sum_{\tau=1}^4 \frac{(ROE_{it+\tau} - R_CT) \times BPS_{it+\tau-1}}{(1 + R_CT)^\tau} + \frac{(ROE_{it+5} - R_CT) \times BPS_{it+4}}{R_CT \times (1 + R_CT)^4}$	$ROE_{it+\tau} = EPS_{it+\tau} / BPS_{it+\tau-1}$, $EPS_{it+\tau} = EPS_{it+2} \times (1+ltg)^{\tau-2}$ for $\tau > 2$. $BPS_{it+\tau} = BPS_{it+\tau-1} + EPS_{it+\tau} \times (1-K)$. $K = \max(0, \min(DPS_{it}/EPS_{it}, 1))$ for profitable firms. $K = \max(0, \min(DPS_{it}/(0.06 \times BPS_{it}), 1))$ for loss firms.
R_GLS	$P_{it} = BPS_{it} + \sum_{\tau=1}^{11} \frac{(ROE_{it+\tau} - R_GLS) \times BPS_{it+\tau-1}}{(1 + R_GLS)^\tau} + \frac{(ROE_{it+12} - R_GLS) \times BPS_{it+11}}{R_GLS \times (1 + R_GLS)^{11}}$	$ROE_{it+\tau} = EPS_{it+\tau} / BPS_{it+\tau-1}$ for $\tau = 1, 2$. $ROE_{it+\tau} = ROE_{it+\tau-1} - fade$ for $\tau > 2$. $fade = (ROE_{it+\tau-2} - HIROE_t) / 10$, $HIROE_t$ is the industry median ROE from year $t-4$ to year t . $BPS_{it+\tau} = BPS_{it+\tau-1} \times (1 + ROE_{it+\tau} \times (1-K))$. $K = \max(0, \min(DPS_{it}/EPS_{it}, 1))$ for profitable firms. $K = \max(0, \min(DPS_{it}/(0.06 \times BPS_{it}), 1))$ for loss firms.

The last two measures are R_AVG1 and R_AVG2 . Because all six measures might have errors in gauging cost of equity capital, we aggregate these together to reduce possible measurement error caused from each model. R_AVG1 is the average value of six measures; $(R_PE + R_PEG + R_MPEG + R_OJN + R_CT + R_GLS) / 6$.

⁴ Following Claus and Thomas (2001), we also presume that the earnings will grow at an inflation rate (US 10-year bond yield – 3 percent) or at a rate of analysts' consensus (ltg). We find similar results.

⁵ In Gebhardt et al. (2001), they assume ROE will diminish at the same rate toward the industry median ROE from year $t + 3$ to year $t + 12$.

R_AVG2 is the average value of four measures excluding maximum and minimum value from the six measures; $(R_PE + R_PEG + R_MPEG + R_OJN + R_CT + R_GLS - \max [R_PE, R_PEG, R_MPEG, R_OJN, R_CT, R_GLS] - \min [R_PE, R_PEG, R_MPEG, R_OJN, R_CT, R_GLS])/4$.

3.3 Empirical Model

We use the following *OLS* regression model (with the detailed subscripts omitted).

$$COE = \beta_0 + \beta_1 DIR_COMP + \beta_2 CEO_COMP + \beta_3 CEO/CHAIR + \beta_4 OUTSIDE + \beta_5 PROBLEM + \beta_6 BOARDSIZE + \beta_7 TOPOWN + \beta_8 STDRET + \beta_9 DISPERS + \beta_{10} BETA + \beta_{11} MOM + \beta_{12} SIZE + \beta_{13} MB + \varepsilon$$

The independent variable *DIR_COMP* indicates equity-based compensation paid to the outside directors. It is the ratio of total equity-based compensation for all outside directors over total compensation (cash and equity, etc.) for all outside directors (i.e., total equity-based compensation divided by total compensation). Since equity compensation for outside directors will tie the interests of directors and shareholders together, a higher proportion of equity compensation for outside directors will result in a lower level of cost of equity capital. So, we expect β_1 to be negative. *CEO_COMP* represents equity-based compensation for the CEO, which is similarly defined as *DIR_COMP*. According to the prior literature, managers' behavior varies. Sometimes, managers will care more about the shareholders due to an alignment of interests (e.g., Nagar et al., 2003), but sometimes, managers will be less care about the shareholders. Rather they only focus on creating their own benefits, for example, right before the stock option grants date (e.g., Aboody & Kasznik, 2000). Thus, we do not make any expectations on β_2 . Following previous studies, we include the other control and firm characteristic variables (e.g., Hail & Leuz, 2006; Attig et al., 2008; Ashbaugh et al., 2009a; Ashbaugh et al., 2009b).

CEO/CHAIR, *OUTSIDE*, *PROBLEM*, *BOARDSIZE*, and *TOPOWN* are corporate governance related variables. *CEO/CHAIR* implies CEO and chairman duality. It is 1 if a CEO is also a chairman of the board and 0 otherwise. The dual position of CEO and Chairman usually weakens corporate governance since board members' monitoring activities will be restricted by the CEO. We expect β_3 to be positive. *OUTSIDE* is the proportion of outside directors on the board. More outside directors intensify the corporate governance, and we anticipate negative coefficients on β_4 (e.g., Ashbaugh et al., 2009a; Ashbaugh et al., 2009b). *PROBLEM* indicates whether there is a director who failed to meet the attendance standards.⁶ It equals 1 if there is at least one director who violates the standards and 0 otherwise. An attendance problem can be interpreted as weak governance. Therefore, we expect a positive value of β_5 . *BOARDSIZE* is the number of directors in the board. It is controversial since a larger board is sometimes efficient but sometimes not. In some cases, a larger board is more efficient since there are more directors to oversee managers with more knowledge and a better background, but in other cases, it is inefficient since there are coordination problem among the directors (e.g., Yermack, 1996). Therefore, we do not predict any directions on β_6 . *TOPOWN* is the percentage of total shares held by the top five executives to total outstanding shares. Managers who possess larger shares are inclined to defend the shareholders' interests. Warfield et al. (1995) report that as management ownership gets larger, earnings will be more informative and discretionary accruals will be smaller. The results clarify that management pursues value-maximizing actions. So, we predict negative coefficients on β_7 .

Furthermore, we include other variables. *STDRET* is standard deviation of daily stock returns for the past 24 months (e.g., Hail & Leuz, 2006; Attig et al., 2008), *DISPERS* is the standard deviation of all forecasts made by analysts divided by median analysts' forecasts (e.g., Attig et al., 2008; Hope et al., 2008), *BETA* measures systematic risk suggested by the Capital Market Asset Pricing Model (e.g., Hail & Leuz, 2006; Ashbaugh et al., 2009a; Chen et al., 2009). *MOM* captures stock price momentum (e.g., Hope et al., 2008; Chen et al., 2009), which is defined the stock return during the previous 12 months. *SIZE* is the log of market value of equity at the beginning of the year, and *MB* is the market-to-book value of the equity ratio (e.g., Hail & Leuz, 2006; Attig et al., 2008; Ashbaugh et al., 2009a).

Shareholders will require less risk premium when the firm is less risky. That is, when the market is less volatile (*STDRET*, *DISPERS*). We expect positive coefficients on β_8 and β_9 . A higher *BETA* implies a higher systematic risk. Therefore, we anticipate positive coefficients on β_{10} since investors require higher cost of equity

⁶ The required attendance rate is 75% or more.

capital for higher *BETA* firms based on Capital Market Asset Pricing Model. According to Guay et al. (2005), previous stock returns might be higher (lower) due to the delayed recognition of bad (good) news. In this case, the value of implied cost of equity capital tends to have downward (upward) bias. So, prior literature reports negative coefficients on stock return momentum (*MOM*). We also expect β_{11} to be negative. Finally, we control *SIZE* and *MB*. We anticipate negative β_{12} since *SIZE* is negatively associated with cost of equity as a proxy for liquidity. In other words, investors require lower risk premium for more liquid stocks. The *MB* ratio, sometimes infers a distress factor, which is inclined to have a lower value (i.e., lower *MB* ratio) for a financially distressed firm. Investors require higher risk premium, i.e. cost of equity capital (e.g., Hail & Leuz, 2006; Attig et al., 2008; Hope et al., 2008) for distressed firms. Thus, we predict positive coefficients on β_{13} .

4. RESULTS

4.1 Descriptive Statistics

In Table 2 and Table 3, we introduce the descriptive statistics on key variables. Our sample has 2,727 firm-year level observations ranging from year 2006 to 2008. In Table 2, we report the distribution of implied cost of equity capital based on eight different methods. Mean (median) values vary between 0.0663 (0.0637) and 0.1139 (0.1044). *R_OJN* is the highest and *R_PE* is the lowest mean (median) value.

Table 2: Descriptive Statistics on Cost of Equity Capital

	# of obs.	Mean	Median	Stdev.	1%	25%	75%	99%
<i>R_PE</i>	2,727	0.0663	0.0637	0.0285	0.0079	0.0253	0.0637	0.1179
<i>R_PEG</i>	2,727	0.1048	0.0937	0.0503	0.0252	0.0451	0.0937	0.2027
<i>R_MPEG</i>	2,727	0.1123	0.0996	0.0521	0.0324	0.0521	0.0996	0.2113
<i>R_OJN</i>	2,727	0.1139	0.1044	0.0995	0.0000	0.0010	0.1044	0.2884
<i>R_CT</i>	2,727	0.0845	0.0798	0.0299	0.0312	0.0465	0.0798	0.1374
<i>R_GLS</i>	2,727	0.1073	0.0977	0.0571	0.0165	0.0392	0.0977	0.2075
<i>R_AVG1</i>	2,727	0.0987	0.0910	0.0378	0.0404	0.0533	0.0910	0.1756
<i>R_AVG2</i>	2,727	0.0970	0.0898	0.0362	0.0391	0.0544	0.0898	0.1698

Table 3: Descriptive Statistics on Independent and Control Variables

	# of obs.	Mean	Median	Stdev.	25%	75%
Independent Variables						
<i>DIR_COMP</i>	2,727	0.5257	0.5357	0.2132	0.4183	0.6686
<i>DIR_RAMT</i> (\$1,000)	2,727	94	75	94	39	122
Control Variables						
<i>CEO_COMP</i>	2,727	0.6463	0.7301	0.2528	0.5419	0.8262
<i>CEO_RAMT</i> (\$1,000)	2,727	4,105	2,404	5,762	901	5,226
<i>CEO/CHAIR</i>	2,727	0.6464	1.0000	0.4781	0.0000	1.0000
<i>OUTSIDE</i>	2,727	0.7620	0.7777	0.1232	0.6923	0.8666
<i>PROBLEM</i>	2,727	0.0722	0	0.2589	0	0
<i>BOARDSIZE</i>	2,727	9.1840	9	2.1399	8	11
<i>TOPOWN</i> (%)	2,727	2.9203	0.6804	6.9597	0.2390	2.0045
<i>INST_OWN</i> (%)	2,727	79.1956	81.9033	18.1474	70.3199	92.6779
<i>STDRET</i>	2,727	0.0894	0.0833	0.0375	0.0611	0.1115
<i>DISPERS</i>	2,727	0.1146	0.0612	0.1742	0.0329	0.1207
<i>BETA</i>	2,727	1.1656	1.0670	0.6579	0.6958	1.5111
<i>MOM</i>	2,727	0.0225	0.0044	0.3724	-0.2221	0.2174
<i>SIZE</i>	2,727	21.5836	21.4264	1.5042	20.4699	22.5504
<i>MB</i>	2,727	3.0126	2.3058	2.6253	1.5652	3.5595

DIR_COMP = ratio of total equity-based compensation for outside directors over total compensation for outside directors in a firm during the fiscal year (i.e. total equity-based incentives / total incentives); *DIR_RAMT* = average amount of equity-based incentives to each director in a firm during the fiscal year; *CEO_COMP* = ratio of total equity-based compensation for CEO over total compensation for CEO; *CEO_RAMT* = total amount of equity-based incentives for CEO in a firm during the fiscal year; *CEO/CHAIR* = 1 if the CEO also holds chairman of the board, and 0 otherwise; *OUTSIDE* = total number of independent outside directors over total number of directors; *PROBLEM* = 1 if there is a director attendance problem (for each director, attendance rate should be above 75%), and 0 otherwise; *BOARDSIZE* = total number of directors in a board; *TOPOWN* = the percentage of total shares held by top five executives to total outstanding shares; *STDRET* = standard deviation of daily stock returns for the previous 24 months; *DISPERS* = the standard deviation of all forecasts made by analysts divided by median analysts' forecasts; *BETA* = estimates from Capital Market Asset Pricing Model; *MOM* = stock return during the previous 12 months; *SIZE* = log of market value of equity at the beginning of year; *MB* = market-to-book value of equity ratio.

Table 3 shows descriptive statistics of independent and control variables. On average, outside directors in a firm receive approximately 53% of their total compensation in stock and/or options. In dollar terms, each outside director is granted \$94,000 of equity-based compensation on average. On the other hand, CEOs are rewarded with much more stock and/or options than outside directors. They receive 65% of total their compensation, approximately \$4.1 million in US dollars, as equity-based compensation. The mean value of *CEO/CHAIR* (0.6464) implies that CEOs of 65% of firm-year observations hold a chairman position at the same time in the sample. Among the board of directors, 76% are outside members. There are only a few attendance problems in our sample (mean of *PROBLEM*: 0.0722). There are approximately 9 members on average. The top five managers hold 2.92% of shares of the firm.

4.2 Results for Difference in Mean (Median) Tests

Table 4 provides the results for difference in mean (median) tests. We divide the sample into two different groups based on the median of *DIR_COMP*. *High (Low) DIR_COMP* consists of above (below)-median *DIR_COMP* observations. We examine whether there is a difference between these two groups. We only report the variables related to the cost of equity capital, CEO compensation (*CEO_COMP*) and corporate governance (*CEO/CHAIR*, *OUTSIDE*, *PROBLEM*, *BOARDSIZE* and *TOPOWN*).

The results explain that there is a significant difference in the cost of equity capital between the groups. Among the eight different specifications, six confirm that higher equity compensation groups have a lower level of the cost of equity capital (except *R_OJN* and *R_GLS*), which is generally consistent with our prediction. Moreover, these also infer that there are significant differences in *CEO_COMP*, *BOARDSIZE*, and *TOPOWN*. We find that higher proportion groups grant more equity compensation to CEOs (*CEO_COMP*) as Brick et al. (2006) explained. These groups also have a small board size (*BOARDSIZE*) and possess lower top management ownership (*TOPOWN*) as prior literature described.⁷

Table 4: Difference in Mean (Median) Tests

	<i>High DIR_COMP</i> (N = 1,364)		<i>Low DIR_COMP</i> (N = 1,363)		<i>High – Low</i>	
	Mean	Median	Mean	Median	Mean	Median
<i>R_PE</i>	0.0596	0.0576	0.0642	0.0608	-0.0047***	-0.0032***
<i>R_PEG</i>	0.1006	0.0927	0.1050	0.0945	-0.0044***	-0.0018***
<i>R_MPEG</i>	0.1008	0.0928	0.1052	0.0945	-0.0044***	-0.0017***
<i>R_OJN</i>	0.1148	0.1065	0.1124	0.1047	0.0020***	0.0017***
<i>R_CT</i>	0.0757	0.0734	0.0791	0.0761	-0.0033***	-0.0027***
<i>R_GLS</i>	0.1099	0.0934	0.1125	0.0950	-0.0026***	-0.0016***
<i>R_AVG1</i>	0.0938	0.0875	0.0967	0.0897	-0.0029***	-0.0023***
<i>R_AVG2</i>	0.0904	0.0831	0.0940	0.0872	-0.0036***	-0.0041***
<i>CEO_COMP</i>	0.6860	0.7684	0.6342	0.7135	0.0520***	0.0549***
<i>CEO/CHAIR</i>	0.5669	1.0000	0.5544	1.0000	0.0130***	0.0000***
<i>OUTSIDE</i>	0.7447	0.7500	0.7356	0.7500	0.0090***	0.0000***
<i>PROBLEM</i>	0.0898	0.0000	0.0827	0.0000	0.0007***	0.0000***
<i>BOARDSIZE</i>	9.1258	9.0000	9.6523	9.0000	-0.5265***	0.0000***
<i>TOPOWN</i>	2.3757	0.6931	3.2022	0.7693	-0.8265***	-0.0761***

CEO_COMP = ratio of total equity-based compensation for CEO over total compensation for CEO; *CEO/CHAIR* = 1 if the CEO also holds chairman of the board, and 0 otherwise; *OUTSIDE* = total number of independent outside directors over total number of directors; *PROBLEM* = 1 if there is a director attendance problem (for each director, attendance rate should be above 75%), and 0 otherwise; *BOARDSIZE* = total number of directors in a board; *TOPOWN* = the percentage of total shares held by top five executives to total outstanding shares; *t*-statistics are in parentheses. ***, **, and * denote significance of parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

⁷ Many studies (e.g., Dechow et al., 1996; Yermack, 1996; Nagar et al., 2003; Ajinkya et al., 2005; Karamanou and Vafeas, 2005; Adams and Ferreira, 2008) suggest that characteristics of strong corporate governance are negatively associated with board size and management ownership.

4.3 Results for Multivariate Tests

Table 5 contains the impact of the proportion of equity-based compensation for outside directors on cost of equity capital. The results are based on the *OLS* regressions. We're especially interested in *DIR_COMP*.⁸

From column 1 to column 6, the results show that the estimated coefficients of *DIR_COMP* are negative and statistically significant. These results support our conjecture that firms with higher equity-based compensation for outside directors have a lower cost of equity capital. Among the six coefficients of *CEO_COMP*, three coefficients are positive and statistically significant and we think these results might suggest that shareholders recognize CEOs' opportunistic behavior (e.g., Aboody & Kasznik, 2000), so shareholders require a higher cost of equity capital. *OUTSIDE* have positive coefficients differing from our prediction. *BOARDSIZE* confirms the idea that a small board is more efficient in monitoring (e.g., Yermack, 1996). *TOPOWN* has negative coefficients and this is evidence of interest alignment between managers and shareholders.

Higher values of *STDRET* and/or *DISPERS* suggest that the market is highly volatile. Shareholders naturally require a higher risk premium for highly volatile firms. Positive coefficients on *STDRET* and *DISPERS* clarify this explanation. The coefficients of *SIZE* alternate, but most of them support our expectation. *SIZE* has negative coefficients, which show that larger firms are more liquid in trading. *MB* consistently has negative coefficients as firms with lower *MB* ratio are highly distressed.

Furthermore, when we use two composite measures to improve soundness of the proxies, we find consistent results. The estimated coefficients of *DIR_COMP* are negative and significant. In addition to that, coefficients of the other variables replicate previous results. Coefficients of *CEO_COMP* and *BOARDSIZE* are positive and significant. *TOPOWN* has a negative coefficient, and the other variables present similar results (results unreported).

5. SENSITIVITY ANALYSES

5.1 Alternative Measure of Equity-Based Compensation

For the sensitivity tests, we apply an additional measure of equity-based compensation for outside directors. Alternatively, we define equity-based compensation for outside directors as the dollar amount of the equity-based compensation awarded to outside directors (*DIR_AMT*). *DIR_AMT* is calculated as the average equity-based compensation for each outside director. The regression results generally reveal that *DIR_AMT* and the implied cost of equity capital have a negative and statistically significant association (results unreported). Even if the coefficients are not all significant, at least the directions are consistent with our expectations (In *R_PE* model and *R_CT* model, the coefficients are negatively significant at the 0.01 level). The overall results suggest that larger amounts of equity-based compensation for outside directors strengthen the monitoring role of outside directors and reduce agency risk.

5.2 Separate Effects of Stock and Option Awards for Directors on the Cost of Equity Capital

Different types of equity-based compensation may affect the implied cost of equity capital in different ways. Problematically, one particular type of equity-based compensation may be driving the results. In addition, outside directors may be sensitive to whether their equity-based compensation is in the form of stock or options. Hence, we conduct further analysis separating the two types of equity-based compensation. The results shown in Table 7 reveal that option-based compensation for outside directors significantly lowers the cost of equity capital. The reason is that only options exhibit a statistically significant effect, which is consistent with Bryan et al. (2000), who suggest that stock options are more efficient than stock grants in motivating outside directors because the payoffs from stock options are convex. In sum, the results suggest that option-based compensation for outside directors reduces the cost of equity capital.

⁸ For the sensitivity tests, we alternatively adopt various specifications of *DIR_COMP*. We use the average amount of equity compensation for outside directors, and we also separate stock and options and measure the proportion of stock and options, respectively. The results are statistically similar and will be shown later.

Table 5: The Impact of the Proportion of Equity-Based Compensation for Outside Directors on Cost of Equity Capital

	(Column 1)	(Column 2)	(Column 3)	(Column 4)	(Column 5)	(Column 6)
	<i>R_PE</i>	<i>R_PEG</i>	<i>R_MPEG</i>	<i>R_OJN</i>	<i>R_CT</i>	<i>R_GLS</i>
<i>Intercept</i>	0.0289 (2.72)***	0.0661 (3.74)***	0.0679 (3.83)***	0.0559 (1.62)	0.0225 (2.23)**	0.0077 (0.23)
<i>DIR_COMP</i>	-0.0080 (-3.00)***	-0.0093 (-2.07)**	-0.0090 (-2.01)**	0.0062 (0.71)	-0.0073 (-2.87)***	-0.0099 (-1.20)
<i>CEO_COMP</i>	0.0082 (3.52)***	0.0043 (1.10)	0.0041 (1.04)	-0.0006 (-0.08)	0.0072 (3.26)***	0.0139 (1.93)*
<i>CEO/CHAIR</i>	-0.0005 (-0.42)	-0.0007 (-0.40)	-0.0007 (-0.39)	-0.0047 (1.32)	0.0004 (0.38)	0.0002 (0.06)
<i>OUTSIDE</i>	0.0083 (1.98)**	0.0214 (3.04)***	0.0214 (3.04)***	0.0445 (3.25)***	0.0101 (2.53)**	0.0196 (1.51)
<i>PROBLEM</i>	-0.0015 (-0.81)	-0.0037 (-1.18)	-0.0037 (-1.17)	-0.0079 (-1.28)	-0.0013 (-0.72)	0.0072 (1.23)
<i>BOARDSIZE</i>	0.0009 (3.36)***	0.0015 (.22)***	0.0015 (3.22)***	0.0016 (1.74)*	0.0009 (3.58)***	0.0027 (3.12)***
<i>TOPOWN</i>	-0.0001 (-1.44)	-0.0001 (0.41)	-0.0001 (-0.41)	0.0005 (1.57)	-0.0002 (-1.83)*	-0.0010 (-3.23)***
<i>STDRET</i>	0.0039 (0.20)	0.2687 (8.21)***	0.2665 (8.12)***	0.4767 (7.44)***	0.0806 (4.32)***	0.4239 (6.98)***
<i>DISPERS</i>	-0.0006 (-1.11)	0.0039 (4.29)***	0.0039 (4.28)***	0.0069 (3.86)***	0.0002 (0.32)	0.0042 (2.45)**
<i>BETA</i>	0.0058 (5.04)***	0.0217 (11.35)***	0.0217 (11.33)***	0.0264 (7.07)***	0.0104 (9.53)***	0.0198 (5.60)***
<i>MOM</i>	-0.0217 (-14.65)***	-0.0478 (-19.28)***	-0.0479 (-19.27)***	-0.0444 (-9.15)***	-0.0262 (-18.51)***	-0.0137 (-2.98)***
<i>SIZE</i>	0.0006 (1.26)	-0.0015 (-1.80)*	-0.0016 (-1.89)*	-0.0026 (-1.65)*	0.0010 (2.19)**	0.0000 (0.01)
<i>MB</i>	-0.0004 (-3.14)***	-0.0007 (-3.48)***	-0.0007 (-3.48)***	-0.0003 (-0.64)	-0.0003 (-2.56)**	0.0014 (3.90)***
<i># of obs.</i>	2,727	2,727	2,727	2,727	2,727	2,727
<i>Adjusted R²</i>	0.1247	0.2380	0.2373	0.1167	0.1027	0.0664

DIR_COMP = ratio of total equity-based compensation for outside directors over total compensation for outside directors in a firm during the fiscal year (i.e. total equity-based incentives / total incentives); *CEO_COMP* = ratio of total equity-based compensation for CEO over total compensation for CEO; *CEO/CHAIR* = 1 if the CEO also holds chairman of the board, and 0 otherwise; *OUTSIDE* = total number of independent outside directors over total number of directors; *PROBLEM* = 1 if there is a director attendance problem (for each director, attendance rate should be above 75%), and 0 otherwise; *BOARDSIZE* = total number of directors in a board; *TOPOWN* = the percentage of total shares held by top five executives to total outstanding shares; *STDRET* = standard deviation of daily stock returns for the previous 24 months; *DISPERS* = the standard deviation of all forecasts made by analysts divided by median analysts' forecasts; *BETA* = estimates from Capital Market Asset Pricing Model; *MOM* = stock return during the previous 12 months; *SIZE* = log of market value of equity at the beginning of year; *MB* = market-to-book value of equity ratio; (Asymptotic) *t*-statistics are in parentheses. ***, **, and * denote significance of parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

Table 6: The Impact of the Proportion of Stock and Options for Outside Directors on Cost of Equity Capital

	(Column 1)		(Column 2)		(Column 3)		(Column 4)		(Column 5)		(Column 6)	
	<i>R</i> _{PE}		<i>R</i> _{PEG}		<i>R</i> _{MPEG}		<i>R</i> _{OJN}		<i>R</i> _{CT}		<i>R</i> _{GLS}	
<i>Intercept</i>	0.0319	(3.02)***	0.0696	(3.94)***	0.0715	(4.04)***	0.0574	(1.66)*	0.0254	(2.53)**	0.0164	(0.50)
<i>STOCK</i>	-0.0004	(0.13)	-0.0004	(-0.08)	0.0000	(0.01)	0.0098	(1.00)	0.0000	(0.01)	0.0118	(1.27)
<i>OPTION</i>	-0.0134	(-4.75)***	-0.0155	(-3.26)***	-0.0153	(-3.22)***	0.0039	(0.42)	-0.0126	(-4.66)***	-0.0257	(-2.93)***
<i>CEO_COMP</i>	0.0079	(3.39)***	0.0039	(1.00)	0.0037	(0.94)	-0.0008	(-0.10)	0.0069	(3.12)***	0.0129	(1.80)*
<i>CEO/CHAIR</i>	-0.0007	(-0.65)	-0.0010	(-0.57)	-0.0010	(-0.55)	-0.0048	(-1.35)	0.0002	(0.15)	-0.0005	(-0.16)
<i>OUTSIDE</i>	0.0052	(1.23)	0.0177	(2.51)**	0.0176	(2.49)**	0.0431	(3.11)***	0.0071	(1.76)*	0.0106	(0.81)
<i>PROBLEM</i>	-0.0015	(-0.82)	-0.0037	(-1.19)	-0.0037	(-1.18)	-0.0079	(-1.28)	-0.0013	(-0.74)	0.0071	(1.23)
<i>BOARDSIZE</i>	0.0007	(2.46)**	0.0012	(2.58)**	0.0012	(2.57)**	0.0015	(1.60)	0.0007	(2.66)***	0.0020	(2.28)**
<i>TOPOWN</i>	-0.0001	(-1.41)	-0.0001	(-0.39)	-0.0001	(-0.39)	0.0005	(1.58)	-0.0002	(-1.81)*	-0.0010	(-3.22)***
<i>STDRET</i>	0.0127	(0.65)	0.2789	(8.51)***	0.2767	(8.43)***	0.4803	(7.47)***	0.0891	(4.79)***	0.4494	(7.41)***
<i>DISPERS</i>	-0.0006	(-1.10)	0.0039	(4.31)***	0.0039	(4.30)***	0.0069	(3.86)***	0.0002	(0.34)	0.0042	(2.47)**
<i>BETA</i>	0.0053	(4.66)***	0.0211	(11.08)***	0.0211	(11.05)***	0.0262	(7.00)***	0.0099	(9.16)***	0.0185	(5.24)***
<i>MOM</i>	-0.0213	(-14.46)***	-0.0473	(-19.13)***	-0.0474	(-19.12)***	-0.0442	(-9.11)***	-0.0258	(-18.34)***	-0.0125	(-2.74)***
<i>SIZE</i>	0.0006	(1.33)	-0.0015	(-1.77)*	-0.0015	(-1.86)*	-0.0026	(-1.65)*	0.0010	(2.26)**	0.0001	(0.06)
<i>MB</i>	-0.0004	(-3.09)***	-0.0007	(-3.44)***	-0.0007	(-3.45)***	-0.0003	(-0.63)	-0.0003	(-2.51)**	0.0015	(3.99)***
<i># of obs.</i>	2,727		2,727		2,727		2,727		2,727		2,727	
<i>Adjusted R</i> ²	0.1363		0.2427		0.2421		0.1165		0.2005		0.0770	

STOCK = the ratio of total STOCK compensation for outside directors over total compensation for outside directors in a firm during the fiscal year; *OPTION* = the ratio of total OPTION compensation for outside directors over total compensation for outside directors in a firm during the fiscal year; *CEO_COMP* = ratio of total equity-based compensation for CEO over total compensation for CEO; *CEO/CHAIR* = 1 if the CEO also holds chairman of the board, and 0 otherwise; *OUTSIDE* = total number of independent outside directors over total number of directors; *PROBLEM* = 1 if there is a director attendance problem (for each director, attendance rate should be above 75%), and 0 otherwise; *BOARDSIZE* = total number of directors in a board; *TOPOWN* = the percentage of total shares held by top five executives to total outstanding shares; *STDRET* = standard deviation of daily stock returns for the previous 24 months; *DISPERS* = the standard deviation of all forecasts made by analysts divided by median analysts' forecasts; *BETA* = estimates from Capital Market Asset Pricing Model; *MOM* = stock return during the previous 12 months; *SIZE* = log of market value of equity at the beginning of year; *MB* = market-to-book value of equity ratio; (Asymptotic) *t*-statistics are in parentheses. ***, **, and * denote significance of parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

6. SUMMARY AND CONCLUSION

This paper investigates the relationship between the equity-based compensation for outside directors and cost of equity capital. We find that the proportion of equity-based compensation for outside directors is negatively associated with the cost of equity capital. These results hold after controlling for general corporate governance measures and other control variables that possibly affect the cost of equity capital. The results are also robust to additional tests using the amount of the equity-based compensation instead of the proportion, and separating equity-based compensation for outside directors into stock and options.

Overall, our findings are consistent in showing that the board of directors is interested in reducing the information asymmetry between managers and shareholders. By doing so, the cost of equity capital will be mitigated by lowering agency risks. This paper also can provide supplementary evidence that the equity-based compensation is one possible tool to improve the corporate governance structure.

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