Independent Director Attention and the Cost of Equity Capital

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ABSTRACT

We study the relation between independent director attention and the cost of equity capital. Masulis and Mobbs (2014; 2017) find that a director with multiple directorships distributes her time and effort (i.e., attention) unequally according to the relative prestige of each directorship. We investigate whether a firm's cost of equity capital reflects such unequal distribution of attention by its directors. We find that firms receiving more director attention are associated with a lower cost of equity capital. These firms also have higher accounting information quality. Moreover, the attention from audit committee directors matters more than that from other directors in reducing the cost of equity capital. Robustness checks show that the results are not driven by firm size. Overall, our evidence is consistent with director attention reducing the cost of equity capital through effective monitoring that increases accounting information quality.

Keywords: Independent director, director attention, board monitoring, cost of equity capital.

Data Availability: Data used in this study are available from the sources identified in the study.

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1. Introduction

The majority of independent directors at S&P 1500 companies serve on more than one directorship. When directors serve on multiple boards, whether these directors can fulfill their responsibilities given the significant time commitment associated with each directorship becomes a real concern (Papadopoulos 2019). Director overboarding (a director sitting on too many boards) is not only a US but also a global issue. For example, 18% CEOs in Canada in 2019 sit on three or more external boards (Papadopoulos 2019). The 2018 UK Corporate Governance Code recommends that "[f]ull-time executive directors should not take on more than one non-executive directorship in a FTSE 100 company or other significant appointment."[1]

Masulis and Mobbs (2014; 2017) find that, to cope with heavy demand on their time, directors with multiple directorships distribute their attention (i.e., time and effort) unequally across their multiple directorships according to the relative prestige of each directorship with more attention devoted to more prestigious boards. Hence, it is important to examine how directors' unequal distribution of their attention among multiple directorships affect the strength of board monitoring and the consequences thereof. Extant literature posits strong board monitoring mitigates agency costs, constrains managerial opportunism, and reduces the cost of capital (Jensen and Meckling 1976; Grossman and Hart 1986). However, there is a surprisingly lack of empirical work documenting the effect of board monitoring on reducing the cost of equity capital.[2] While prior studies on board monitoring tend to focus on board independence and composition (e.g.,

[1] The 2018 UK Corporate Governance Code is available at https://www.frc.org.uk/getattachment/88bd8c45-50ea-4841-95b0-d2f4f48069a2/2018-UK-Corporate-Governance-Code-FINAL.pdf.

[2] One exception is a working paper by Ashbaugh et al. (2004) who show a negative association between board independence and the cost of equity capital.

Klein 2002; Xie et al. 2003; Larcker, Richardson, and Tuna 2007),[3] we focus on board activities—director attention, pioneered in Masulis and Mobbs (2014; 2017). In this study, we examine whether director attention to a firm is associated with the firm's cost of equity capital.

Shivdasani and Yermack (1999) suggest that more talented and accomplished directors tend to have multiple directorships. Because it is time-consuming for a director to fulfill her directorial responsibilities, multiple directorships may constrain a director's ability to devote full attention to one particular directorship (Yermack 1996; Core, Holthausen, and Larcker 1999; Fich and Shivdasani 2006; Papadopoulos 2019). Consequently, directors with multiple directorships have to prioritize their directorships so that they can allocate their time and effort accordingly. Masulis and Mobbs (2014) argue that an independent director has a strong incentive to preserve and enhance her director reputation. Given limited time and energy, it is only natural that a director prioritizes her directorships based on each directorship's relative prestige and importance, which Masulis and Mobbs (2014) use firm size (market capitalization) to proxy for. Consistent with their expectation, Masulis and Mobbs (2014) find compelling evidence that a director devotes more (less) time and effort to her more (less) prestigious directorships where time and effort are measured by board meeting attendance and serving on more demanding board committees. In addition, they find that a firm receiving more (less) director attention, measured by a higher (lower) proportion of its directors who view their directorships with the firm as high (low) prestige, is associated with better (worse) operating performance and higher (lower) market valuation indicated by Tobin's *q*.[4] Masulis and Mobbs (2017) further find that a firm receiving more director attention is associated with a lower likelihood of negative events (e.g., exchange delisting,

[3] Following these prior studies, we also focus on independent directors as they are the monitors of corporate practice.
[4] We use director attention and directorship prestige interchangeably in this paper because Masulis and Mobbs (2014) show that a firm receives more director attention (i.e., time and effort) if a larger proportion of its directors view their directorships with the firm as prestigious.

violation of debt covenants, backdating of stock options, securities lawsuits, and reduction in cash dividend) and a higher frequency of positive events (e.g., stock repurchases, increases in dividend, and stock splits).

Furthermore, Huang et al. (2018) find that firms receiving more director attention enjoy better bank loan contracting terms such as lower spreads, longer maturities, fewer covenants, lower syndicate concentration, lower likelihood of collateral requirement, and lower annual loan fees. Their evidence indicates that director attention is associated with lower cost of borrowing. In sum, the above studies suggest that firm-size based directorship prestige motivates directors to prioritize their attention to more prestigious directorships and such unequal distribution of director attention across multiple directorships have economic consequences in the form of firm performance, firm valuation, and bank loan contracting terms. We extend the literature from a different perspective, namely, the shareholders.

We expect a director's unequal distribution of attention among multiple directorships to affect a firm's cost of equity for the following reasons. First, director attention is necessary for effective monitoring of accounting practice. Prior studies find that more diligent boards and audit committees, as proxied by meeting frequency, are associated with higher financial reporting quality where higher reporting quality is measured by (1) less earnings management (Xie, Davidson, and DaDalt 2003), (2) higher earnings quality (Vafeas 2005), (3) a lower likelihood of earnings restatement (McMullen and Raghunandan 1996), and (4) more conservative accounting (Garcia Lara, Garcia Osma, and Penalva 2009). From an opposite perspective (i.e., lack of director attention), Masulis and Zhang (2019) find compelling evidence that firms with distracted audit committee directors who attend fewer meetings due to *exogenous* events (e.g., major

illness/injuries, winning major awards, and distractions from another directorship) experience lower accounting information quality as proxied by unexplained audit fees.

Theoretically, Lambert, Leuz, and Verrecchia (2007) develop a model and show that accounting information quality can directly and indirectly affect a firm's cost of equity capital. Specifically, they propose that higher accounting information quality decreases the assessed variance of a firm's cash flows and its assessed covariances with the sum of the aggregated cash flows in the market, directly leading to a lower cost of equity capital; furthermore, the quality of accounting information affects a firm's real decisions including the amount of assets appropriated by the management, indirectly influencing the expected cash flows to investors and the firm's cost of equity capital. Consistent with this theory, Ashbaugh-Skaife et al. (2009) show that firms with internal control weaknesses, an acute case of low accounting information quality,[5] are associated with significantly higher idiosyncratic risk, beta, and costs of equity capital. Francis et al. (2004; 2005) find that high (low) earnings quality is associated with low (high) cost of capital. To summarize, prior studies find that more (less) diligent boards and audit committees are associated with higher (lower) accounting information quality, which, in turn, is associated with lower (higher) cost of equity. We, thus, expect that director attention to a firm is negatively associated with the firm's cost of equity capital.

Second, effective board monitoring (e.g., more director attention) reduces agency costs, leading to a lower cost of equity capital. Ashbaugh et al. (2004, p. 33) hypothesize and find that good governance (effective board monitoring) mitigates agency costs between shareholders and managers and thus reduces the cost of capital. Third, better board monitoring enhances firm

[5] Prior studies find that firms with internal control weaknesses are more likely to have both intentional and unintentional errors in their financial statements or lower accounting information quality (Ashbaugh-Skaife et al. 2008; Doyle et al. 2007).

performance. For example, Vafeas (1999) find that operating performance improves following years of abnormal board activity. Masulis and Mobbs (2014) find that a firm receiving more director attention is associated with better operating performance and higher Tobin's Q. Masulis and Zhang (2019) demonstrate that firms with distracted directors (i.e., receiving less director attention) are associated with declining firm value and operating performance. If a firm that receives more director attention has better financial performance, we expect such a firm to be negatively associated with the cost of equity capital because better firm performance reduces the probability of financial distress and thus the cost of equity.

We base our empirical tests on a large sample of S&P 1500 firms from 1998 to 2011 (12,058 firm-year observations). Because Masulis and Mobbs (2014, pp. 412-419) provide extensive evidence that directors are more willing to work harder in their relatively more prestigious directorships relative to their less prestigious directorships, we will not repeat their tests. Instead, we take it as given that a firm with a larger percentage of its directors viewing their directorships with the firm as prestigious does receive more diligent monitoring or more director attention. We simply investigate whether such a firm is associated with a lower cost of equity capital. Following Masulis and Mobbs (2014), we use firm size to proxy for the relative prestige of a directorship to the independent director. In our multivariate analysis, we control for board and firm characteristics. We find that a firm receiving more director attention (or a firm with a greater proportion of independent directors who view their directorships with the firm as high prestige) is associated with a lower cost of equity capital. Further analysis indicates that a firm receiving more director attention is associated with higher accounting information quality, which suggests one important channel for director attention to affect the cost of equity capital. Moreover, our evidence indicates

that the attention from audit committee members matters more than that from other directors in reducing the cost of equity capital.

Prior literature provides ample evidence that the cost of equity capital is negatively associated with firm size. Our measure of director attention and the relative prestige of a directorship are based on firm size. A natural concern, therefore, is that our results may be driven by firm size. This is exactly the same concern that Masulis and Mobbs (2014; 2017) address for their results. We address this concern in several ways. First, Masulis and Mobbs (2014; 2017) show that director attention to a firm (or the proportion of a firm's independent directors who view their directorships with the firm as high prestige) is not solely driven by that firm's size. For example, firms with equal size may be viewed as not equally prestigious by their directors, depending on the size of the *other* firms served by these directors. Second, we employ the propensity score matching method to control for the differences in firm size and other firm characteristics between firms receiving more and less director attention. Specifically, we construct two subsamples: the high director attention subsample and low director attention subsample. The high (low) director attention subsample consists of firm-year observations where the majority of a firm's directors rank their directorships with the firm as high (low) prestige.[6] In the first-stage regression, we compute propensity scores from a probit model relating the probability of being in the high or low director attention subsample to its determinants (e.g., firm size). We then match each firm-year in the high attention subsample with a firm-year in the low attention subsample in the same industry and with the closest propensity score. In the propensity score matched sample, the high director attention subsample and the low director attention subsample are no longer significantly different in firm size and other matched firm characteristics. Using this propensity score matched sample,

[6] See Section 3 for more details about the criterion of high and low director attention.

we continue to find that firms that attract more director attention enjoys a lower cost of equity capital than firms that attract less director attention. Because there is *no* significant difference in firm size between the high and low director attention subsamples, our observed lower cost of equity capital for the high director attention subsample relative to the low director attention subsample *cannot* be driven by firm size. This finding also suggests that our main results of a negative relation between director attention and the cost of equity capital is not entirely due to firm size. Third, we use alternative measures of a directorship's prestige and director attention to a firm that are not directly linked to firm size (e.g., rate of return on assets). Our main result of a negative relation between director attention and the cost of equity capital still holds.

To summarize, the above argument and tests suggest that our director attention measure is not merely capturing differences in firm size. Rather, it captures differential attention that directors give to firms as demonstrated in Masulis and Mobbs (2014; 2017), which, in turn, affects the cost of equity capital.

We make two important contributions to the literature. First, despite the prevalence of directors serving on multiple boards and a global concern of overboarding, there are only a limited number of studies that examine the economic consequences of a director's unequal distribution of attention across her multiple directorships (e.g., Masulis and Mobbs 2014 and 2017; Huang et al. 2018; Bryan and Mason 2020). We thus contribute to this emerging literature by examining the effect of a director's unequal attention across multiple directorships on the cost of equity capital. Our results suggest that when retaining a director, a firm needs to take into consideration the relative attention (or time and effort) it will receive from that director because, among other effects, this has implications for the firm's cost of equity capital, supporting the guidelines in the 2018 UK Corporate Governance Code that "[w]hen making new appointments, the board should take into

account other demands on directors' time."[7] We also respond to the concern expressed in Young (2000) that how the appointment of outside directors improve board effectiveness remain an open question by showing that an appointment of a director who devotes her attention to the directorship enhances monitoring effectiveness as evidenced by a reduced cost of equity capital.[8]

Second, we add to the literature on the cost of equity. Given the importance of board monitoring, it is surprising that few papers have examined the effect of board monitoring on the cost of equity capital for U.S. firms. We contribute to this line of research by examining how the uneven distribution of directors' attention affects the cost of equity capital, which to date is unexplored in the literature.

The remainder of the paper is organized as follows. We discuss prior research and develop our hypotheses in Section 2. Section 3 describes the sample selection process and presents descriptive statistics. Section 4 discusses the results of our main analyses, and Section 5 presents the results of additional analyses. Section 6 concludes the study.

2. Prior Literature and Hypotheses Development

2.1. Multiple directorship and board effectiveness

Prior research suggests that multiple directorships can negatively affect directors' ability to effectively monitor all the firms under their supervision (Core et al. 1999; Shivdasani and Yermack 1999; Fich and Shivdasani 2006). For example, Shivdasani and Yermack (1999) suggest that CEOs are likely to appoint busy directors (directors who serve on three or more other boards

[7] The 2018 UK Corporate Governance Code further recommends that "[p]rior to appointment, significant commitments should be disclosed with an indication of the time involved. Additional external appointments should not be undertaken without prior approval of the board, with the reasons for permitting significant appointments explained in the annual report."

[8] Young (2000, page 1339) states: "The issue of how and to what extent the appointment of NEDs results in an improvement in actual board effectiveness remains an open question on which further research is required". NEDs stand for non-executive directors.

if they are employed, and six or more boards if they are retired) to reduce monitoring pressure. Core et al. (1999) find that busy directors are associated with excessive CEO compensation that leads to lower firm performance. Fich and Shivdasani (2006) propose that firms with a majority of outside directors holding three or more directorships have weaker governance, poorer operating profitability, and lower market valuation. They also show that the market responds positively to news of the departure of busy directors. Papadopoulos (2019) points out that overboarding is a global concern. He shows that companies with overboarded directors (non-CEO directors who serve on more than four public company boards and CEOs who serve on more than two boards including the board of the company they manage) perform worse compared to companies without overboarded directors. However, Ferris, Jagannathan, and Pritchard (2003) find no evidence that busy directors shirk their responsibilities to serve on subcommittees; furthermore, they find no association between multiple directorships and the likelihood of a securities class action lawsuit.

By simply summing up the number of directorships, prior studies implicitly assume that directors distribute their attention *equally* among multiple directorships. Masulis and Mobbs (2014) challenge this implicit assumption. They argue that directors value each directorship differently, and are likely to prioritize their attention (time and effort) among multiple directorships according to each directorship's relative prestige (or reputation benefits that can be derived from that directorship) with more attention to more prestigious directorships. Since firm size is naturally associated with visibility, prestige, compensation, and opportunity to attract additional external director appointments (Ferris et al. 2003; Ryan and Wiggins 2004; Adams and Ferreira 2008), Masulis and Mobbs (2014) use firm size (market capitalization) to proxy for the relative prestige of a directorship to the director who holds multiple directorships. In director-level analyses, they find that independent directors with multiple directorships are more likely to attend (serve on) the

board meetings (the time-consuming audit committees and compensation committees) of prestigious directorships, i.e., firms with larger market capitalization. In addition, when a firm's performance deteriorates, directors whose directorships with that firm are more (less) prestigious are less (more) likely to relinquish their board seats, i.e., independent directors relinquish their least prestigious directorship significantly more frequently than their most prestigious directorship. These findings provide compelling evidence that directors devote more (less) time and effort to their more (less) prestigious directorships and that they are more (less) committed to their more (less) prestigious directorships.

Masulis and Mobbs (2014) argue that if directors devote more time and effort to their more prestigious directorships, this additional time and effort will manifest itself in better firm performance and higher firm value. In firm-level analyses, Masulis and Mobbs (2014) aggregate a firm's directors up and calculate a proportion of its directors who view their directorships with the firm as prestigious. They use this proportion to proxy for director attention that a firm receives and find that a firm receiving more director attention (or a firm with a greater proportion of its independent directors viewing their directorships with that firm as prestigious) is associated with better operating performance (i.e., higher ROA), higher Tobin's Q, and a higher implied probability of forced CEO turnover when firm performance drops (indicative of more diligent director monitoring). In addition, Masulis and Mobbs (2017) find that a firm receiving more director attention is associated with less negative corporate outcomes, such as stock delisting, debt covenant violation, option backdating, securities class-action lawsuits, and dividend reductions. These firms are also more likely to experience positive outcomes such as stock repurchases, dividend increases, and stock splits. Taken together, the above two studies suggest that the increased monitoring by a firm's directors who view their directorships with the firm as prestigious

manifest itself in enhanced firm performance, firm value, and implied probability of forced CEO turnover following performance deterioration and by reducing (increasing) negative (positive) corporate outcomes.

Huang et al. (2018) examine whether board quality is affected by director attention through the perspective of bank loans. They find that firms receiving more director attention enjoy better bank loan contracting terms such as lower spreads, longer maturities, fewer covenants, lower syndicate concentration, lower likelihood of collateral requirement, and lower annual loan fees.

Lin, Pope, and Young (2003) investigate UK stock market reaction to the appointment of outside board members in order to shed light on the value of adding independent directors to the board. They find that shareholders perceive appointing independent directors as adding value only if both conditions are met: (1) the firm has large agency problems, and (2) the appointee possesses strong ex ante monitoring incentives. When one or both conditions are not met, appointments of outside directors add no value. Duchin, Matsusaka, and Ozbas (2010) utilize regulation changes during 1999-2003 that mandate increases in outside directors as an *exogenous* increase in board independence and examine the effect of board independence on firm performance.[9] They show that the effectiveness of independent directors depends on the cost of acquiring information about the firm; when the cost for outside directors to acquire information is low (high), adding independent directors to the board improves (worsens) firm performance as measured by ROA, Tobin's Q, and stock returns. However, adding outside directors to the board does not help or hurt firm performance on average (without conditioning on the cost of acquiring information). Our paper differs from Lin et al. (2003) and Duchin et al. (2010). Both papers document the value of having independent directors on the board when certain conditions are met. We, in contrast, take

[9] Young (2000) finds that UK's policy statements that called for increases in independent directors improved board structure and made the board more equipped to monitor the managers effectively.

the number of independent directors on the board as given and examine the effect of independent director attention (time and effort) on the firm's cost of equity capital. We complement Lin et al. (2003) and Duchin et al. (2010) by adding the nuance of director attention and documenting the value of director attention in reducing the cost of equity capital.

To summarize, Lin et al. (2003) and Duchin et al. (2010) document the value of adding independent directors to the board. Masulis and Mobbs (2014; 2017) and Huang et al. (2018) investigate how independent directors with multiple directorships prioritize their attention across multiple directorships and the consequences of such differential attention to more prestigious directorships in terms of improving firm performance, reducing negative corporate outcomes, and decreasing the cost of debt capital.

2.2. Multiple directorships, accounting information quality, and the cost of equity

Board monitoring, and especially monitoring by audit committees, is critically important in constraining managers' opportunistic accounting behavior. Prior studies find that independent, diligent, and expert audit committees enhance financial reporting quality (Beasley 1996; Vafeas 2005; Chen and Zhou 2007; Krishnan, Wen, and Zhao 2011).[10] In contrast, Masulis and Zhang (2019) examine directors who are distracted by exogenous personal or professional events. They find that distracted directors are less likely to participate in board meetings and their firms (receiving less attention due to director distraction) are likely to experience a deterioration in accounting quality as measured by the unexpected audit fee. They also show that the findings are

[10] Beasley (1996) finds that the proportion of independent directors on boards is negatively associated with the likelihood of a financial statement fraud, suggesting that independent directors enhance a board's ability to properly execute its oversight function. Vafeas (2005) documents that diligent audit committees (with high meeting frequency) enhance earnings quality. Chen and Zhou (2007) show that Andersen clients with more independent audit committees, audit committees with greater financial expertise, and larger and more independent boards dismissed Andersen earlier. They also find that Andersen clients with larger and more active audit committees as well as more independent boards were more likely to choose a Big 4 successor auditor. Krishnan, Wen and Zhao (2011) find that the presence (and proportion) of directors with legal backgrounds on the audit committee is associated with higher financial reporting quality.

mainly driven by distracted directors who sit on the audit committee. In a similar spirit, Bryan and Mason (2020) find that a firm receiving less director attention due to a large proportion of its directors who view their directorships with the firm as less prestigious (or offering lower reputation incentives) is associated with lower accruals quality (or financial reporting quality) and higher audit fees.[11]

Given that a director distributes her attention unevenly among multiple directorships according to the relative prestige of each directorship (Masulis and Mobbs 2014) and weaker director monitoring efforts (e.g., poor board meeting attendance) lead to lower accounting information quality (Masulis and Zhang 2019; Bryan and Mason 2020), the effectiveness of a director's monitoring of a firm's financial reporting will vary with the relative prestige of the firm in her multiple directorships. Consistent with this reasoning, we expect firms receiving more attention from its directors to have higher accounting information quality.

Based on a single-period multi-security setting that is consistent with Capital Asset Pricing Model (CAPM), Lambert, Leuz, and Verrecchia (2007) show that the quality of accounting information can affect a firm's cost of equity capital both directly and indirectly. They start with expressing CAPM in terms of the expected values and covariances of future cash flows. They then show that the ratio of the expected future cash flow to the covariance of the firm's cash flow with the aggregated cash flows of all other firms in the market is a key factor in determining of the cost of capital. The direct effect refers to the effect that higher quality accounting information decreases a firm's assessed variance of cash flows and its assessed covariances with other firms' cash flows,

[11] Our paper is similar to Bryan and Mason (2020) in that both papers examine directors with multiple directorships. Their "director reputation incentives" are equivalent to our director attention because a director will devote more attention to a more prestigious directorship or a directorship offering higher reputation incentives.

leading to a lower cost of equity capital.[12] Specifically, since the end-of-period cash flow is unobservable, market participants have to assess both the variance and covariance based on the accounting information signal from the firm (e.g., earnings). Higher noise in the accounting information signal thus result in, higher variance and covariance. Since this measurement error (the noise) cannot be diversified away, higher noise leads to higher cost of equity capital.

The indirect effect is the effect that higher quality accounting information affects a firm's real decisions and thus indirectly influences the expected cash flows to investors and the firm's cost of equity capital. Lamber et al. (2007) suggest that the quality of accounting information also affects other real decisions in production and investment, which in turn affects the ratio of expected cash flow to the covariance risk and thus the cost of equity capital.

Prior empirical works have shown results consistent with Lambert et al. (2007) in that higher (lower) quality accounting information reduces (increases) the cost of equity capital. For example, Ashbaugh-Skaife et al. (2009) show that firms with internal control weaknesses, a strong case of low accounting information quality, have higher cost of equity capital. Consistent with Ashbaugh-Skaife et al. (2009), Kim, Rees and Sila (2020) find significant decreases in the cost of equity for UK firms with high bribery exposure after the passage of the UK Bribery Act 2010 since the Bribery Act improves corporate internal control. Francis et al. (2004; 2005) demonstrate that higher earnings quality is associated with lower cost of equity capital.

Given that the cost of equity reflects a firm's accounting information quality and firms receiving more director attention have higher accounting information quality, we expect that a firm receiving more director attention is associated with a lower cost of equity capital.

[12] Johnstone (2015) suggests that better information (higher quality information or more disclosures) will necessarily reduce the uncertainly on firm value but might increase some firms' cost of capital since better information will lead to new assessments on the firm's future cash flow and its covariance with other firms in a mean-variance CAPM.

2.3. Multiple directorships, firm performance, and the cost of equity

Strong board monitoring is associated with less agency costs, higher profitability, and lower stock return volatility, thereby reducing the cost of equity. For example, Vafeas (1999) finds that more frequent board meetings improve next year's operating performance. Ashbaugh et al. (2004) document a negative relation between board independence and the cost of equity. They suggest that this relation can result from the lower stock return volatility associated with strong governance. Masulis and Mobbs (2014) show that firms that receive more director attention have better firm performance such as higher ROA. Masulis and Mobbs (2017) show that firms receiving more director attention are associated with a lower likelihood of negative events and a higher frequency of positive events. Masulis and Zhang (2019) demonstrate that firms with distracted directors (i.e., receiving less director attention) are associated with declining firm value and operating performance. If a firm that attracts more (less) director attention has better (worse) financial performance, we expect firms receiving more director attention to be associated with a lower cost of equity capital because better firm performance reduces the probability of financial distress and thus the cost of equity.

Based on the above discussion of how director attention affects accounting information quality and firm performance, we propose the following hypothesis:

> **Hypothesis:** *Firms receiving more director attention due to a higher proportion of independent directors who rank their directorships with the firms as prestigious are associated with lower costs of equity capital.*

3. Research Design

3.1. Sample selection

Panel A of Table 1 presents the sample selection procedure. We start by collecting independent director data from RiskMetrics and merge this data with Compustat for the years 1998 to 2011. We then merge director data (e.g., *Percent_DrAttn_High* and *Percent_DrAttn_Low*, see the definition below) for a firm in year *t* with that firm's cost of equity capital (e.g., COC_{AVG}, see the definition below) in the subsequent year *t*+1. Our initial sample consists of 18,434 firm-year observations with director data available in RiskMetrics, which covers board information for the S&P 1500 firms. We then exclude 2,844 observations in the financial industries. Next, we drop 2,828 observations which do not have the necessary data to calculate the cost of equity capital. Last, we exclude 704 observations due to the lack of necessary data to construct the control variables. Our final sample consists of 12,058 firm-year observations. We extract financial data from Compustat and stock return data from CRSP.

Panel B of Table 1 presents the sample distribution by year. The sample size distributes roughly evenly over time, ranging from a low of 726 firms in 2008 to a high of 957 firms in 2009.

3.2. Variable measurement

Our treatment variable is director attention to a firm, which, according to Masulis and Mobbs (2014), captures the monitoring effectiveness of a firm. Following Masulis and Mobbs (2014; 2017), we adopt two measures of director attention at the firm level. We initially measure directorship prestige at the director level by ranking a director's all directorships according to their market capitalization in a year. Among all directorships of a director, the directorship with larger (smaller) market capitalization is deemed more (less) prestigious. Following Masulis and Mobbs (2014; 2017), we classify a director's directorship as high (low) prestige in a year if that directorship is at least 10% larger (smaller) than the director's smallest (largest) directorship in the same year based on market capitalization. We then aggregate all independent directors of a firm in

a year together to obtain a director attention measure at the firm level. Our first firm-level measure of director attention, *Percent_DrAttn_High* (*Percent_DrAttn_Low*), is the percentage of a firm's independent directors in year *t* who view their directorships with the firm as high (low) prestige. Our second firm-level measure of director attention, *Majority_DrAttn_High* (*Majority_DrAttn_Low*), is an indicator variable that equals one if the majority or more than 50 percent of a firm's independent directors in year *t* view their directorships with the firm as high (low) prestige, and zero otherwise, i.e., *Majority_DrAttn_High* (*Majority_DrAttn_Low*) = 1 if *Percent_DrAttn_High* (*Percent_DrAttn_Low*) > 0.5, and 0 otherwise.

Our dependent variable is the cost of equity capital. Following Dhaliwal, Heitzman, and Li (2006) and Chava (2014), we estimate firm-year specific implied cost of equity capital using the Gebhardt, Lee, and Swaminathan (2001) model, the Ohlson and Jeuttner-Nauroth (2005) model as implemented by Gode and Mohanram (2003), and the Easton (2004) model. The cost of equity measures estimated by these three models are labeled COC_{GLS}, COC_{OJN}, and COC_{MPEG}, respectively. We also calculate an average cost of equity (COC_{AVG}) from these three measures.

3.3. Regression model

We use the following regression model to examine the relation between the cost of equity capital and director attention:

$$\begin{aligned} COC = {} & \beta_0 + \beta_1 Percent\_DrAttn\_High\ (Majority\_DrAttn\_High) \\ & + \beta_2 Percent\_DrAttn\_Low\ (Majority\_DrAttn\_Low) + \beta_3 Majority\ Independent \\ & + \beta_4 CEO\ Ownership + \beta_5 CEO\ Ownership\ Squared + \beta_6 Independent\ Ownership \\ & + \beta_7 Size + \beta_8 Beta + \beta_9 BM + \beta_{10} Idiosyncratic\ Risk + \beta_{11} LEV + \beta_{12} MMT \\ & + Industry + Year + \varepsilon, \end{aligned} \quad (1)$$

where *COC* is one of our four cost of equity measures: COC_{GLS}, COC_{OJN}, COC_{MPEG}, and COC_{AVG} measured in the subsequent year *t*+1 and all variables are defined in Appendix A.

Following Masulis and Mobbs (2014), we control for several governance characteristics in our regression analysis. Specifically, we include *Majority Independent*, *CEO Ownership*, *CEO Ownership Squared*, and *Independent Ownership* in Equation (1). Drawing on prior studies (Qian and Strahan 2007; Boubakri and Ghouma 2010; Qi et al. 2010), we also control for firm characteristics. We include company size (*Size*) because prior research finds that the cost of equity capital is lower for larger companies (Banz 1981; Botosan and Plumlee 2005). We include *Beta* because the capital asset pricing model predicts a positive association between systematic risk and the cost of equity capital. Because Fama and French (1995) suggest that the book-to-market ratio (*BM*) proxies for financial distress and we expect financial distress to be positively associated with the *ex ante* cost of equity capital, we include the book-to-market ratio (*BM*) in our model. We include idiosyncratic risk (*Idiosyncratic Risk*) to control for arbitrage risk (Goyal and Santa-Clara 2003; Mashruwala, Rajgopal, and Shevlin 2006), which we expect to be positively associated with the *ex ante* cost of equity capital. Because company risk is increasing in leverage (Modigliani and Miller 1958; Gebhardt et al. 2001), we expect the *ex ante* cost of equity capital to be positively associated with financial leverage (*LEV*). We also use the stock return over the fiscal year as a proxy for momentum (*MMT*).[13] Finally, we include industry and year dummies to control for industry and year fixed effects. See Appendix A for more details of variable definitions.

4. Empirical Results

4.1. Descriptive statistics

Table 2 shows the descriptive statistics of key variables. The mean and median of COC_{GLS} (COC_{OJN}, COC_{MPEG}) are 0.085 (0.116, 0.112) and 0.083 (0.106, 0.103), respectively. The mean

[13] Our results are robust if we control for a firm's earnings quality measured using the absolute values of the firm's discretionary accruals.

Percent_DrAttn_High is 0.165, suggesting that on average 16.5 percent of independent directors on a board view their directorships with the firm as high prestige. In contrast, 19.1 percent of independent directors on a board view their directorships with the firm as low prestige (*Percent_DrAttn_Low*). On average, 6.3 (6.8) percent of our sample observations have boards where more than 50 percent of independent directors view their directorships as high (low) prestige (*Majority_DrAttn_High* (*Majority_DrAttn_Low*)). The mean of the majority of directors on a board being independent (*Majority Independent*) is 0.871, suggesting that only a small portion of our sample, 12.9 percent, have boards with less than 50 percent independent directors. On average, CEOs own 2.9 percent of outstanding shares and independent director ownership is 1.1 percent. Finally, the means of *Size*, *Beta*, *BM*, *Idiosyncratic Risk*, *LEV*, and *MMT* are 7.579, 1.020, 0.473, 0.089, 0.216, and 0.080, respectively.

4.2 Relation between the cost of equity capital and director attention

Table 3 Panel A presents the results from estimating Equation (1) when using COC_{AVG} as a measure of the cost of equity capital. Column (1) presents the results using *Percent_DrAttn_High* and *Percent_DrAttn_Low* as a measure of director attention. As shown, the coefficient on *Percent_DrAttn_High* (β_1) is significantly negative (-0.004, t-statistic = -2.62). Moving from the first quartile (0.000) to the third quartile (0.286) of *Percent_DrAttn_High* reduces the cost of equity by 11.44 basis points.[14] The coefficient on *Percent_DrAttn_Low* (β_2) is significantly positively (0.006, t-statistic = 5.38). Moving from the first quartile (0.000) to the third quartile (0.300) for *Percent_DrAttn_Low* increases the cost of equity by 18 basis points.[15] The difference between β_1 and β_2 is highly significant (F = 28.01, p-value = 0.00). These results show that a firm receiving more director attention is associated with a lower cost of equity, whereas a firm receiving less

[14] It is calculated as follows: 0.286 × 0.004 = 0.001144.
[15] It is calculated as follows: 0.300 × 0.006 = 0.0018.

director attention is associated with a higher cost of equity. These findings are consistent with the notion that director attention enhances director monitoring of a firm with the consequence of a lower cost of equity capital.

Column (2) presents the results using *Majority_DrAttn_High* and *Majority_DrAttn_Low* as a measure of director attention. Column (2) shows that the coefficient on *Majority_DrAttn_High* is negative but insignificant, whereas that on *Majority_DrAttn_Low* is significantly positive. The difference between the two coefficients (β_1 and β_2) is again highly significant (F = 8.96, p-value = 0.00).

Table 3 Panel B presents the results from estimating Equation (1) when the cost of equity measure is COC_{GLS}, COC_{OJN}, and COC_{MPEG}, respectively. Since we have two measures of director attention for each measure of cost of equity, we have six sets of regression results, reported in Columns (1) - (6). The results for each of these three cost of equity measures are qualitatively similar as the results in Panel A. For example, the coefficients on *Percent_DrAttn_High* and *Majority_DrAttn_High* are significantly negative whereas those on *Percent_DrAttn_Low* and *Majority_DrAttn_Low* are significantly positive when the cost of equity is measured using COC_{GLS}. To summarize, the results in Panel B suggest that our results in Panel A are robust to all three individual measures of the cost of equity.

4.3 Director attention and the quality of accounting information

In the hypothesis development, we posit that higher (lower) director attention would lead to higher (lower) quality of accounting information. In this section, we provide empirical evidence on this proposition. Specifically, we employ the following two measures of accounting information quality: (1) discretionary accruals (*DA*) estimated from ROA matched modified Jones model (Kothari et al. 2005), and (2) the probability of informed trades (*PIN*) based on Brown and

Hillegeist (2007), which captures the probability of a stock trade generated from an informed investor with higher values and indicates higher information asymmetry for the firm. Our *DA* is signed following Geiger and North (2006) and Lobo and Zhou (2010).[16] A positive *DA* means that managers use positive discretionary accruals to manage earnings upward and thus indicates low earnings quality; a large *PIN* indicate high information asymmetry and thus low accounting information quality (Brown and Hillegeist 2007; Jayaraman 2008). So, our *DA* and *PIN* are inverse proxies for accounting information quality; larger (smaller) values of *DA* and *PIN* indicate lower (higher) accounting information quality.

We examine the effect of director attention on accounting information quality using the modified Equation (1). We replace the dependent variable, *COC*, by our measures of accounting information quality, *DA* or *PIN*, and add one additional explanatory variable, *Auditor Tenure*, because auditor tenure affects accounting information quality. Table 4 presents the results. We find that *Percent_DrAttn_High* (*Percent_DrAttn_Low*) and *Majority_DrAttn_High* (*Majority_DrAttn_Low*) to be negatively (positively) associated with both *DA* and *PIN*. These findings suggest that higher (lower) director attention is associated with lower (higher) discretionary accruals and information asymmetry. Thus, the results are consistent with our proposition that higher director attention is associated with higher quality of accounting information, which provides an important channel for director attention to influence the cost of equity capital.

4.4 Attention of audit committee directors vs. other directors

[16] As stated in Geiger and North (2006, p. 785), "Consistent with DeFond and Jiambalvo (1994), Becker et al. (1998), and Chung and Kallapur (2003), we examine signed current discretionary accruals. These earlier researchers have argued that companies are rarely sued for booking accruals to reduce earnings, so examining signed discretionary accruals is the most appropriate measure of the intentional influence of management on financial reporting."

Because the results in the preceding section indicate that director attention enhances the quality of accounting information, which is the primary responsibility of audit committee members, we explore whether attention from audit committee members matters more than that from other directors in reducing the cost of equity capital. We measure the attention of audit committee directors by *Percent_AC_DrAttn_High* (*Percent_AC_DrAttn_Low*), defined as the percentage of a firm's independent directors on the audit committee in year *t* who view their directorship with the firm as high (low) prestige. *Percent_non_AC_DrAttn_High* and *Percent_non_AC_DrAttn_Low* are defined similarly for non-audit committee directors. *More_Attn_AC* is an indicator variable that is set to one if a firm's *Percent_AC_DrAttn_High* is greater than or equal to *Percent_non_AC_DrAttn_High* or *Percent_AC_DrAttn_Low* is less than or equal to *Percent_non_AC_DrAttn_Low*, and zero otherwise.[17] Hence, *More_Attn_AC* captures the firms whose audit committee directors pay more (or at least equal) attention to the firm than other directors do.

In Table 5, we partition sample into two subsamples based on whether *More_Attn_AC* equals zero or one. In Columns 1 and 2, where *More_Attn_AC* equals zero indicating lower attention from audit committee members (or more attention from non-audit committee directors), none of these four variables of interests are significant. In contrast, in Columns 3 and 4, where *More_Attn_AC* equals one indicating higher attention from audit committee members (or less attention from non-audit committee directors), three variables of interests (except *Majority_DrAttn_High*) carry significant coefficients with directions consistent with higher (lower) director attention reducing (increasing) the cost of equity capital. Overall, Table 5 suggests that

[17] Results are qualitative similar if we define *More_Attn_AC* as an indicator variable that is set to one if a firm's *Percent_AC_DrAttn_High* is greater than or equal to *Percent_non_AC_DrAttn_High* AND *Percent_AC_DrAttn_Low* is less than or equal to *Percent_non_AC_DrAttn_Low*, and zero otherwise.

the attention from audit committee members matters more than that from other directors in reducing the cost of equity capital.

5. Additional Analysis

5.1. Propensity Score Matching

Given that we use firm size to proxy for a directorship's prestige and director attention that a firm receives following Masulis and Mobbs (2014) and given that prior research finds that larger firms are likely to have better financial stability and thus have a lower cost of equity, our results relating the cost of equity capital to director attention could be driven by differences in firm size. Although we include *Size* (= natural logarithm of total assets) in our regressions to control for this size effect, we conduct a propensity score matching test to alleviate this potential concern.

Table 6 Panel A presents the results for the first-stage regression. The dependent variable is *High_Low*, an indicator variable that equals one if *Majority_DrAttn_High* equals one, and zero if *Majority_DrAttn_Low* equals one. We exclude observations where *Majority_DrAttn_High* is not equal to one or *Majority_DrAttn_Low* is not equal to one and obtain a sample of 1,580 observations. Due to missing values for a new explanatory variable, *Percent Female*, our final sample size for the first stage regression is 1,436. As shown in Panel A of Table 6, firms with larger market capitalization (*LnMV*) or higher return on assets (*ROA*) are more likely to have high director attention (*High_Low* = 1). Firms with higher financial leverage (*LEV*) are less likely to have high director attention. We use the estimated coefficients from this first-stage regression to compute a propensity score for each observation in our sample. We then match, without replacement, each firm-year in the high director attention subsample (i.e., *High_Low* = 1) with a firm-year in the low director attention subsample (i.e., *High_Low* = 0) in the same Fama-French 48 industry and with

the closest propensity score within 3 percent caliper.[18] We use these matched firms as the control sample. Our matched sample consists of 494 firm-year observations (247 observations in the high and low director attention subsamples, respectively). In the matched sample, the differences between treatment (i.e., high director attention) and control (i.e., low director attention) subsamples are insignificant for all explanatory variables, *LnMV*, *LEV*, *ROA*, *Percent Female*, and *Majority Independent*, in the first stage (untabulated). For example, the mean *LnMV* is 8.304 for the treatment subsample (i.e., *High_Low* = 1) and 8.245 for the control subsample (i.e., *High_Low* = 0). The difference in means is insignificant (t-statistic = 0.513). In short, in the propensity score matched sample, the treatment subsample and control subsample no longer differ significantly in firm size (*LnMV*), financial leverage (*LEV*), profitability (*ROA*), female directors (*Percent Female*), and board independence (*Majority Independent*).

Table 6 Panel B presents the regression results from estimating Equation (1) using the propensity-score matched sample. As shown, the coefficient on *High_Low* is significantly negative (-0.006, t-statistic = -2.40), suggesting that more (less) director attention is associated with a lower (higher) cost of equity. This alleviates the concern that our results may be driven by firm size.

5.2. Relation between director attention and the cost of equity: Using alternative director attention measures

Table 7 presents the results from estimating Equation (1) when we define *Percent_DrAttn_High*, *Percent_DrAttn_Low*, *Majority_DrAttn_High*, and *Majority_DrAttn_Low* using alternative ranking schemes. Recall, a director's directorship with a firm is classified as high prestige if that directorship is at least 10 percent larger than the director's smallest directorship in the same year where the size of a directorship is measured by the firm's market capitalization. We

[18] The results are qualitatively similar if we choose a 2 percent or 5 percent caliper. In addition, the results are qualitatively similar if we match by firm size (*LnMV*) and industry instead of propensity score.

change the cutoff point from 10 percent to 20 percent (50 percent) and report our findings in Panel A (Panel B). Panel C reports the results when we use a firm's market value of total assets (= market capitalization plus book value of liabilities), instead of a firm's market capitalization, to classify a director's directorship with that firm into high or low prestige. Panel D reports the results when we use a firm's return on assets (*ROA*), instead of a firm's market capitalization, to classify a director's directorship with that firm into high or low prestige. Panel E reports the results when we use a firm's Tobin's Q, instead of a firm's market capitalization, to classify a director's directorship with that firm into high or low prestige. As shown in Table 7, our results are robust to all these alternative director attention measures. Importantly, a firm's return on assets (*ROA*) is not directly linked to firm size. The fact that we obtain qualitatively similar results when measuring director attention based on *ROA* (see Panel D, Table 7) suggests that our main results of a negative relation between the cost of equity capital and director attention is not due to our measure of director attention capturing differences in firm size.

5.3. Firm fixed effects

To mitigate the potential effects induced by omitted, time-invariant variables, we employ a firm-fixed effect model. Table 8 presents the relation between director attention and the cost of equity after controlling for firm fixed effects. Column (1) presents the results using *Percent_DrAttn_High* and *Percent_DrAttn_Low* and shows that firms receiving less director attention have higher costs of equity. Column (2) presents the results using *Majority_DrAttn_High* and *Majority_DrAttn_Low* and the results are qualitatively similar.

6. Conclusions

In this study, we examine the relation between director attention and the cost of equity capital. Prior literature, such as Masulis and Mobbs (2014; 2017), Huang et al. (2018), and Bryan and Mason (2020), finds that directors distribute their time and effort unequally across their multiple directorships according to each directorship's relative prestige and such unequal distribution of director attention has economic consequences. We investigate whether the cost of equity reflects such unequal distribution of monitoring effort. We find that firms receiving more director attention (or firms with a greater proportion of independent directors who view their directorships with the firms as high prestige) have lower costs of equity. In addition, these results are robust to various sensitivity tests, including propensity score matching, alternative measures of director attention, and firm-fixed effects regressions. We also find that director attention is positively associated with the quality of a firm's accounting information. Moreover, our evidence indicates that the attention from audit committee members matters more than that from other directors in reducing the cost of equity capital. Overall, our findings suggest that director attention reduces the cost of equity capital through effective monitoring that enhances accounting information quality.

We contribute to the literature in two ways. First, we extend the literature on economic consequences of directors' unequal distribution of attention across their multiple directorships (e.g., Masulis and Mobbs 2014; 2017; Huang et al. 2018; Bryan and Mason 2020). Our results suggest that the relative attention a firm receives from its directors has significant implications for the firm's cost of equity capital, i.e., firms that do not receive adequate attention from their directors bear real costs in the form of increased cost of equity capital. Our findings support the 2018 UK Corporate Governance Code that requires firms to take into consideration other demands on directors' time when appointing new directors. Second, we add to the literature on the cost of

equity capital. Our study is among the first to examine whether board monitoring affects the cost of equity capital from the perspective of unequal distribution of director attention across multiple directorships.

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APPENDIX A
Variable Definition

Variable	Definition
Cost of Equity Capital	
COC_{GLS}	Implied cost of equity capital in the subsequent year (year t+1) estimated using the Gebhardt, Lee, and Swaminathan (2001) model following the procedure in Dhaliwal et al. (2006, p. 720). Source: I/B/E/S, Compustat, and CRSP.
COC_{OJN}	Implied cost of equity capital in the subsequent year (year t+1) estimated using the Ohlson and Jeuttner-Nauroth (2005) model as implemented by Gode and Mohanram (2003) following the procedure in Dhaliwal et al. (2006, p. 721). Source: I/B/E/S, Compustat, and CRSP.
COC_{MPEG}	Implied cost of equity capital in the subsequent year (year t+1) estimated using the Easton (2004) model following the procedure in Dhaliwal et al. (2006, p. 721). Source: I/B/E/S, Compustat, and CRSP.
COC_{AVG}	Average of COC_{GLS}, COC_{OJN}, and COC_{MPEG}.
Board Characteristics	
Percent_DrAttn_High	Percentage of a firm's independent directors in year t who view their directorships with the firm as high prestige. A director's directorship is classified as high prestige if that directorship is at least 10% larger than her smallest directorship in the same year where the size of directorship is measured by the firm's market capitalization. Source: Risk Metrics and Compustat.
Percent_DrAttn_Low	Percentage of a firm's independent directors in year t who view their directorships with the firm as low prestige. A director's directorship is classified as low prestige if that directorship is at least 10% smaller than her largest directorship in the same year where the size of directorship is measured by the firm's market capitalization. Source: Risk Metrics.
Majority_DrAttn_High	Indicator variable that equals 1 if the majority or more than 50% of a firm's independent directors in year t view their directorships with the firm as high prestige (i.e., *Percent_DrAttn_High* > 0.5), and is 0 otherwise. Source: Risk Metrics.
Majority_DrAttn_Low	Indicator variable that equals 1 if the majority or more than 50% of a firm's independent directors in year t view their directorships with the firms as low prestige (i.e., *Percent_DrAttn_Low* > 0.5), and 0 otherwise. Source: Risk Metrics.
High_Low	Indicator variable that is set to 1 if *Majority_DrAttn_High* equals1 and 0 if *Majority_DrAttn_Low* equals 1.
Majority Independent	Indicator variable that is set to 1 if the majority or more than 50% of directors are independent directors, and 0 otherwise. Source: Risk Metrics.
CEO Ownership	Percentage of common shares outstanding held by the CEO at year-end, including stock options. Source: Risk Metrics.
CEO Ownership Squared	Square of *CEO Ownership*. Source: Risk Metrics.
Independent Ownership	Percentage of common shares outstanding held by the independent directors at year-end, including stock options. Source: Risk Metrics.
Firm Characteristics	
Size	Natural log of the book value of total assets (AT) at the end of year t. Source: Compustat.
Beta	Beta is estimated for each firm-year observation by regressing monthly returns on the value-weighted market returns of NYSE/AMEX/NASDAQ. Sixty (with a minimum of 24) monthly observations before the month at which the cost of capital is computed are used in the regression.
BM	Book-to-market ratio = book value of equity (CEQ) divided by market value of equity (PRCC_F×CSHO). Source: Compustat.
Idiosyncratic Risk	the standard deviation of the residuals from the above regression used to estimate *Beta*.

LEV	Financial leverage = the sum of debt in current liabilities (DLC) and long-term debt (DLTT) divided by total assets Source: Compustat.
MMT	The stock return over the fiscal year ($PRCC\_F_t - PRCC\_F_{t-1}$) / $PRCC\_F_{t-1}$. Source: Compustat.
BigN	Indicator variable that is set to 1 if a firm's auditor in year *t* is one of the Big N auditors, and 0 otherwise.
Percent Female	Percentage of independent directors who are female. Source: Risk Metrics.
AC Directors vs Non AC Directors Test	
Percent_AC_DrAttn_High	Percentage of a firm's independent directors of the audit committee in year *t* who view their directorships with the firm as high prestige. A director's directorship is classified as high prestige if that directorship is at least 10% larger than her smallest directorship in the same year where the size of directorship is measured by the firm's market capitalization. Source: Risk Metrics and Compustat.
Percent_AC_DrAttn_Low	Percentage of a firm's independent directors of the audit committee in year *t* who view their directorships with the firm as low prestige. A director's directorship is classified as low prestige if that directorship is at least 10% smaller than her largest directorship in the same year where the size of directorship is measured by the firm's market capitalization. Source: Risk Metrics.
Percent_non_AC_DrAttn_High	Percentage of a firm's independent directors of the non-audit committee in year *t* who view their directorships with the firm as high prestige. A director's directorship is classified as high prestige if that directorship is at least 10% larger than her smallest directorship in the same year where the size of directorship is measured by the firm's market capitalization. Source: Risk Metrics and Compustat.
Percent_non_AC_DrAttn_Low	Percentage of a firm's independent directors of the non-audit committee in year *t* who view their directorships with the firm as low prestige. A director's directorship is classified as low prestige if that directorship is at least 10% smaller than her largest directorship in the same year where the size of directorship is measured by the firm's market capitalization. Source: Risk Metrics.
More_Attn_AC	Indicator variable that is set to 1 if a firm's *Percent_AC_DrAttn_High* is greater than or equal to *Percent_non_AC_DrAttn_High or Percent_AC_DrAttn_Low* is less than or equal to *Percent_non_AC_DrAttn_Low*, and 0 otherwise. If the variable equals 1 (0), it indicates that the firm receives more (less) attention from the audit committee directors relative to non-audit committee directors. Source: Risk Metrics.
Channel Test	
DA	Discretionary accrual estimated from ROA matched modified Jones model (Kothari et al., 2005)
PIN	The probability of informed traded, which refers to the probability of a stock trade generates from an informed investor. High values indicate higher information asymmetry. This measure is downloaded from https://scholar.rhsmith.umd.edu/sbrown/pin-data?destination=node/998 Source: Brown and Hillegeist (2007);
ROA	Income before extraordinary items scaled by total assets.
Loss	Indicator variable that is set to 1 if a firm's income before extraordinary items in any of the last three years is negative, and 0 otherwise.
NOA	Sum of shareholders' equity less cash and marketable securities plus total debt scaled by total assets.
Auditor Tenure	Natural log of the number of years the auditor has been with the firm.

TABLE 1
Sample

Panel A: Sample Selection

	Observation
Total firm-year independent director observations available in Risk Metrics and merged with Compustat	18,434
Less:	
Observations from financial services industries	(2,844)
Observations with insufficient data to calculate cost of equity	(2,828)
Observations with insufficient data to calculate control variables	(704)
Final sample during 1998-2011	12,058

Panel B: Sample Distribution by Year

Year	Frequency	Percentage	Cumulative
1998	871	7.220	7.220
1999	834	6.920	14.14
2000	797	6.610	20.75
2001	872	7.230	27.98
2002	823	6.830	34.81
2003	892	7.400	42.20
2004	909	7.540	49.74
2005	912	7.560	57.31
2006	878	7.280	64.59
2007	749	6.210	70.80
2008	726	6.020	76.82
2009	957	7.940	84.76
2010	943	7.820	92.58
2011	895	7.420	100%
Total	12,058	100%	

TABLE 2

Descriptive Statistics

Variable	N	Mean	STDDEV	Q1	Median	Q3
Cost of Equity Capital						
COC_{GLS}	12,058	0.085	0.022	0.070	0.083	0.097
COC_{OJN}	12,058	0.116	0.038	0.090	0.106	0.132
COC_{MPEG}	12,058	0.112	0.038	0.087	0.103	0.128
COC_{AVG}	12,058	0.104	0.029	0.084	0.098	0.117
Board Characteristics						
Percent_DrAttn_High	12,058	0.165	0.210	0.000	0.100	0.286
Percent_DrAttn_Low	12,058	0.191	0.223	0.000	0.143	0.300
Majority_DrAttn_High	12,058	0.063	0.244	0.000	0.000	0.000
Majority_DrAttn_Low	12,058	0.068	0.252	0.000	0.000	0.000
Majority Independent	12,058	0.871	0.335	1.000	1.000	1.000
CEO Ownership	12,058	0.029	0.075	0.002	0.008	0.023
CEO Ownership Squared	12,058	0.006	0.127	0.000	0.000	0.001
Independent Ownership	12,058	0.011	0.038	0.001	0.002	0.007
Firm Characteristics						
Size	12,058	7.579	1.452	6.509	7.420	8.503
Beta	12,058	1.020	0.526	0.654	0.979	1.351
BM	12,058	0.473	0.299	0.260	0.415	0.617
Idiosyncratic Risk	12,058	0.089	0.043	0.057	0.080	0.112
LEV	12,058	0.216	0.165	0.060	0.215	0.335
MMT	12,058	0.080	0.417	-0.190	0.039	0.271

TABLE 3

Relation between Director Attention and Cost of Equity

This table presents the OLS estimation results of the effect of director attention on the cost of equity capital. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. All variables are defined in Appendix A.

Panel A: Director Attention and Average Cost of Equity				
	(1)		(2)	
Variable	COC_{AVG}		COC_{AVG}	
Percent_DrAttn_High (β_1)	-0.004***	(-2.62)		
Percent_DrAttn_Low (β_2)	0.006***	(5.38)		
Majority_DrAttn_High (β_1)			-0.000	(-0.48)
Majority_DrAttn_Low (β_2)			0.004***	(3.62)
Majority Independent (β_3)	-0.000	(-0.68)	-0.000	(-0.46)
CEO Ownership (β_4)	-0.007*	(-1.68)	-0.007*	(-1.80)
CEO Ownership Squared (β_5)	0.004***	(2.88)	0.004***	(3.06)
Independent Ownership (β_6)	-0.000	(-0.08)	0.000	(0.00)
Size (β_7)	-0.000	(-1.12)	-0.001**	(-2.55)
Beta (β_8)	0.003***	(4.43)	0.003***	(4.54)
BM (β_9)	0.034***	(31.83)	0.035***	(32.96)
Idiosyncratic Risk (β_{10})	0.652***	(15.74)	0.651***	(15.70)
LEV (β_{11})	0.027***	(15.92)	0.028***	(16.43)
MMT (β_{12})	-0.003***	(-4.83)	-0.003***	(-4.88)
Intercept (β_0)	4.330***	(57.13)	5.636***	(55.74)
Year dummies	Included		Included	
Industry dummies	Included		Included	
N	12,058		12,058	
Adj. R^2	0.356		0.355	
F-test for H_0: $\beta_1 = \beta_2$	28.01***		8.96***	

TABLE 3 – Continued

Panel B: Director Attention and an Individual Cost of Equity Measure						
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	COC_{GLS}	COC_{OJN}	COC_{MPEG}	COC_{GLS}	COC_{OJN}	COC_{MPEG}
Percent_DrAttn_High (β_1)	-0.005***	-0.00300	-0.003*			
	(-4.52)	(-1.52)	(-1.78)			
Percent_DrAttn_Low (β_2)	0.003***	0.008***	0.008***			
	(3.07)	(5.12)	(5.24)			
Majority_DrAttn_High (β_1)				-0.003***	0.001	0.000
				(-3.62)	(0.72)	(0.41)
Majority_DrAttn_Low (β_2)				0.002**	0.005***	0.005***
				(2.57)	(3.29)	(3.44)
Majority Independent (β_3)	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000
	(-1.61)	(-0.36)	(-0.26)	(-1.61)	(-0.11)	(-0.02)
CEO Ownership (β_4)	0.004	-0.012**	-0.012**	0.004	-0.013**	-0.013**
	(1.34)	(-2.16)	(-2.17)	(1.36)	(-2.29)	(-2.30)
CEO Ownership Squared (β_5)	0.001	0.006**	0.006***	0.001	0.006***	0.006***
	(0.50)	(2.57)	(2.70)	(0.51)	(2.73)	(2.87)
Independent Ownership (β_6)	-0.011**	0.005	0.004	-0.011**	0.006	0.005
	(-2.43)	(0.62)	(0.51)	(-2.41)	(0.70)	(0.59)
Size (β_7)	0.000	-0.000	-0.000	-0.000	-0.001***	-0.001***
	(1.13)	(-1.59)	(-1.58)	(-0.23)	(-2.75)	(-2.80)
Beta (β_8)	0.00100	0.004***	0.003***	0.001*	0.004***	0.004***
	(1.64)	(4.62)	(4.39)	(1.68)	(4.72)	(4.50)
BM (β_9)	0.037***	0.032***	0.033***	0.038***	0.033***	0.034***
	(48.06)	(22.32)	(23.38)	(49.90)	(23.18)	(24.28)
Idiosyncratic Risk (β_{10})	0.170***	0.916***	0.871***	0.170***	0.914***	0.869***
	(5.70)	(16.49)	(15.99)	(5.72)	(16.44)	(15.95)
LEV (β_{11})	0.022***	0.029***	0.031***	0.023***	0.030***	0.032***
	(13.70)	(12.74)	(13.67)	(13.96)	(13.21)	(14.15)
MMT (β_{12})	0.001**	-0.005***	-0.005***	0.001**	-0.005***	-0.005***
	(2.13)	(-6.02)	(-5.92)	(2.10)	(-6.07)	(-5.97)
Intercept (β_0)	0.047***	0.063***	0.055***	0.048***	0.065***	0.057***
	(17.54)	(12.71)	(11.33)	(18.27)	(13.29)	(11.90)
Year dummies	Included	Included	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included	Included	Included
N	12,058	12,058	12,058	12,058	12,058	12,058
Adj. R^2	0.435	0.283	0.291	0.435	0.282	0.290
F-test for H_0: $\beta_1 = \beta_2$	26.34***	19.05***	21.30***	18.14***	3.97**	5.23**

TABLE 4

Director Attention and the Quality of Accounting Information

This table presents the OLS estimation results for how director attention affects the quality of accounting information as measured by discretionary accruals and the likelihood of informed trades. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. All variables are defined in Appendix A.

	(1)	(2)	(3)	(4)
	DA	*DA*	*PIN*	*PIN*
Percent_DrAttn_High (β1)	-0.016***		-0.014***	
	(-2.62)		(-6.74)	
Percent_DrAttn_Low (β2)	0.014***		0.006***	
	(2.76)		(2.96)	
Majority_DrAttn_High (β1)		-0.002		-0.002
		(-0.56)		(-1.31)
Majority_DrAttn_Low (β2)		0.008*		0.005***
		(1.83)		(2.84)
Majority Independent (β_3)	-0.008**	-0.008**	-0.006***	-0.006***
	(-2.26)	(-2.25)	(-4.44)	(-4.57)
CEO Ownership (β_4)	-0.018	-0.0190	0.041***	0.042***
	(-0.98)	(-1.01)	(5.91)	(6.02)
CEO Ownership Squared (β_5)	0.010*	0.011*	-0.004	-0.004
	(1.70)	(1.80)	(-1.16)	(-1.15)
Independent Ownership (β_6)	0.008	0.008	0.023***	0.024***
	(0.29)	(0.31)	(2.85)	(2.92)
Size (β_7)	0.003***	0.001	-0.019***	-0.021***
	(2.59)	(1.57)	(-50.84)	(-58.54)
ROA (β_8)	0.003	-0.002	-0.066***	-0.069***
	(0.17)	(-0.08)	(-8.78)	(-9.11)
LEV (β_9)	0.014**	0.017**	0.037***	0.038***
	(2.04)	(2.39)	(15.37)	(15.86)
Loss (β_{10})	-0.011***	-0.011***	0.000	0.000
	(-3.82)	(-3.75)	(0.41)	(0.40)
NOA (β_{11})	-0.000	-0.000	-0.000**	-0.000**
	(-0.72)	(-0.79)	(-2.13)	(-2.49)
BigN (β_{12})	-0.012**	-0.012**	-0.004**	-0.004**
	(-2.30)	(-2.28)	(-2.20)	(-2.21)
Auditor Tenure (β_{13})	0.000**	0.000**	0.000***	0.000***
	(2.14)	(2.17)	(3.43)	(3.43)
Intercept (β_0)	-0.041**	-0.033**	0.261***	0.268***
	(-2.37)	(-1.96)	(49.66)	(50.77)
Year dummies	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included
N	10,691	10,691	10,030	10,030
Adj. R^2	0.0111	0.0101	0.470	0.467
F-test for H_0: $\beta_1 = \beta_2$	13.56***	2.72*	46.15***	9.02***

TABLE 5

Director Attention: Audit Committee Directors vs. Other Directors

This table presents the OLS estimation results on the effect of director attention on the cost of equity capital based on two subsamples partitioned on whether a firm's audit committee directors pay at least equal attention to the firm than other directors. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. All variables are defined in Appendix A.

	More attention from non-audit committee (More_Attn_AC = 0)		*More attention from audit committee (More_Attn_AC = 1)*	
	(1)	(2)	(3)	(4)
Variable	COC_{AVG}	COC_{AVG}	COC_{AVG}	COC_{AVG}
Percent_DrAttn_High (β_1)	0.001		-0.004***	
	(0.29)		(-2.61)	
Percent_DrAttn_Low (β_2)	0.003		0.006***	
	(0.44)		(5.32)	
Majority_DrAttn_High (β_1)		0.000		-0.001
		(-0.13)		(-0.57)
Majority_DrAttn_Low (β_2)		-0.003		0.004***
		(-1.06)		(3.90)
Majority Independent (β_3)	0.003	0.003	-0.010	-0.000
	(0.66)	(0.76)	(-0.67)	(-0.46)
CEO Ownership (β_4)	-0.124***	-0.125***	-0.005	-0.005
	(-4.44)	(-4.57)	(-1.21)	(-1.31)
CEO Ownership Squared (β_5)	0.145***	0.150***	0.003**	0.004***
	(3.43)	(3.54)	(2.48)	(2.64)
Independent Ownership (β_6)	0.023	0.021	-0.001	-0.001
	(1.49)	(1.39)	(-0.19)	(-0.11)
Size (β_7)	0.001	0.001	-0.000	-0.001***
	(0.87)	(1.03)	(-1.32)	(-2.78)
Beta (β_8)	0.004*	0.005**	0.003***	0.003***
	(1.87)	(2.00)	(4.16)	(4.27)
BM (β_9)	0.028***	0.028***	0.035***	0.035***
	(6.96)	(7.11)	(30.97)	(32.11)
Idiosyncratic Risk (β_{10})	0.839***	0.835***	0.639***	0.638***
	(4.60)	(4.59)	(15.06)	(15.02)
LEV (β_{11})	0.035***	0.035***	0.027***	0.028***
	(5.81)	(5.79)	(15.30)	(15.76)
MMT (β_{12})	-0.005**	-0.005**	-0.003***	-0.003***
	(-2.02)	(-2.01)	(-4.54)	(-4.59)
Intercept (β_0)	0.001	0.001	0.056***	0.057***
	(0.08)	(0.10)	(15.47)	(16.29)
Year dummies	Included	Included	Included	Included
Industry dummies	Included	Included	Included	Included
N	731	731	11,327	11,327
Adj. R^2	0.431	0.432	0.355	0.353
F-test for H_0: $\beta_1 = \beta_2$	0.03	0.68	27.46***	10.33***

TABLE 6

Relation between Directorship Importance and Cost of Equity: Propensity Score Matching

This table presents the OLS estimation results of the effect of director attention on financial risk. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. All variables are defined in Appendix A.

Panel A: Selection of High vs. Low Director Attention		
Variable	*High_Low*	
Ln(MV)	10.713***	(15.84)
LEV	-3.694***	(-6.07)
ROA	9.456***	(4.72)
Percent Female	-0.458	(-0.92)
Majority Independent	-0.047	(-0.17)
Intercept	-20.081***	(-13.09)
Year dummies	Included	
Industry dummies	Included	
N	1,436	
Pseudo R^2	0.417	
Panel B: Effect of High vs. Low Director Attention on Cost of Equity		
Variable	COC_{AVG}	
High_Low	-0.006***	(-2.40)
Controls and Intercepts	Included	
Year dummies	Included	
Industry dummies	Included	
N	494	
Adj. R^2	0.293	

TABLE 7

Relation between Director Attention and Cost of Equity: Using Alternative Director Attention Measures

This table presents OLS regression results of the effect of director attention on the cost of equity capital using alternative measures of director attention. Panels A and B classify a director's directorship as high (low) prestige if that directorship is at least 20% or 50% larger (smaller) than the director's smallest (largest) directorship where the size of directorship is measured by the firm's market capitalization. Panel C reports results using market value of total assets (market value of equity plus book value of liabilities) to measure a directorship's prestige. Panel D reports results using ROA to measure a directorship's prestige. Panel E reports results using Tobin's Q to measure a directorship's prestige. The four director attention measures in a panel are based on the definition of a directorship's prestige in that panel. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. All variables are defined in Appendix A.

Panel A: Director Attention and Average Cost of Equity: 20% as the Threshold				
	(1)		(2)	
Variable	COC_{AVG}		COC_{AVG}	
Percent_DrAttn_High (β_1)	-0.003**	(-2.47)		
Percent_DrAttn_Low (β_2)	0.007***	(5.52)		
Majority_DrAttn_High (β_1)			-0.000	(-0.46)
Majority_DrAttn_Low (β_2)			0.005***	(4.11)
Controls and Intercept	Included		Included	
Year dummies	Included		Included	
Industry dummies	Included		Included	
N	12,058		12,058	
Adj. R^2	0.356		0.355	
F-test for H_0: $\beta_1 = \beta_2$	27.97***		11.32***	
Panel B: Director Attention and Average Cost of Equity: 50% as the Threshold				
	(1)		(2)	
Variable	COC_{AVG}		COC_{AVG}	
Percent_DrAttn_High (β_1)	-0.004***	(-2.65)		
Percent_DrAttn_Low (β_2)	0.006***	(5.37)		
Majority_DrAttn_High (β_1)			-0.000	(-0.48)
Majority_DrAttn_Low (β_2)			0.004***	(3.62)
Controls and Intercept	Included		Included	
Year dummies	Included		Included	
Industry dummies	Included		Included	
N	12,058		12,058	
Adj. R^2	0.356		0.355	
F-test for H_0: $\beta_1 = \beta_2$	33.53***		13.64***	

TABLE 7 – Continued

Panel C: Director Attention and Average Cost of Equity: Market Value of Total Assets				
	(1)		(2)	
Variable	COC_{AVG}		COC_{AVG}	
Percent_DrAttn_High (β_1)	-0.004***	(-2.65)		
Percent_DrAttn_Low (β_2)	0.006***	(5.37)		
Majority_DrAttn_High (β_1)			-0.000	(-0.48)
Majority_DrAttn_Low (β_2)			0.004***	(3.62)
Controls and Intercept	Included		Included	
Year dummies	Included		Included	
Industry dummies	Included		Included	
N	12,058		12,058	
Adj. R^2	0.357		0.356	
F-test for H_0: $\beta_1 = \beta_2$	33.53***		13.64***	
Panel D: Director Attention and Average Cost of Equity: ROA				
	(1)		(2)	
Variable	COC_{AVG}		COC_{AVG}	
Percent_DrAttn_High (β_1)	-0.007***	(-5.45)		
Percent_DrAttn_Low (β_2)	0.012***	(8.67)		
Majority_DrAttn_High (β_1)			-0.002**	(-2.07)
Majority_DrAttn_Low (β_2)			0.010***	(7.62)
Controls and Intercept	Included		Included	
Year dummies	Included		Included	
Industry dummies	Included		Included	
N	12,058		12,058	
Adj. R^2	0.361		0.359	
F-test for H_0: $\beta_1 = \beta_2$	105.64***		54.80***	
Panel E: Director Attention and Average Cost of Equity: Tobin's Q				
	(1)		(2)	
Variable	COC_{AVG}		COC_{AVG}	
Percent_DrAttn_High (β_1)	-0.003***	(-3.07)		
Percent_DrAttn_Low (β_2)	0.011***	(7.87)		
Majority_DrAttn_High (β_1)			-0.003***	(-3.68)
Majority_DrAttn_Low (β_2)			0.007***	(4.96)
Controls and Intercept	Included		Included	
Year dummies	Included		Included	
Industry dummies	Included		Included	
N	12,058		12,058	
Adj. R^2	0.359		0.357	
F-test for H_0: $\beta_1 = \beta_2$	64.46***		38.72***	

TABLE 8

Relation between Director Attention and Cost of Equity: Firm Fixed Effects

This table presents OLS regression results of the effect of director attention on the cost of equity capital controlling for firm fixed effects. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level (two-tailed), respectively. All variables are defined in Appendix A.

Variable	(1) COC_{AVG}		(2) COC_{AVG}	
Percent_DrAttn_High (β_1)	0.002	(1.35)		
Percent_DrAttn_Low (β_2)	0.005***	(3.28)		
Majority_DrAttn_High (β_1)			-0.000	(-0.27)
Majority_DrAttn_Low (β_2)			0.003***	(2.75)
Controls and Intercept	Included		Included	
Year dummies	Included		Included	
Industry dummies	Included		Included	
Firm Fixed Effects	Included		Included	
N	12,058		12,058	
Within R^2	0.124		0.124	
F-test for H_0: $\beta_1 = \beta_2$	2.57*		5.57**	