CEO Tenure and the Cost of Equity Capital

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In this study, we investigate the relationship between CEO tenure and the implied cost of equity capital. Using 29,519 firm-year observations spanning the period from 1993 to 2021, we find a negative relationship between CEO tenure and the cost of equity. The negative relationship between CEO tenure and the cost of equity indicates that the cost of equity is higher for firms with CEOs in their early tenure, and the cost of equity is lower for firms with CEOs in their later tenure. Overall, our empirical evidence supports that investors perceive CEO tenure as a value-relevant signal in determining the cost of equity capital.

Keywords: CEO tenure, cost of equity capital, CEO career concerns, risk-taking

INTRODUCTION

The role of Chief Executive Officers (CEOs) in shaping the strategic direction and financial performance of their firms has been the subject of considerable interest among academics, practitioners, and policymakers. One key aspect of CEO influence is their tenure, or the length of time they have been in their position. The tenure of the CEO is a crucial determinant of organizational stability and continuity, as well as the implementation of long-term strategic plans.

The CEO is considered one of the most important positions in a company, responsible for setting the strategic direction of the firm, managing its operations, and driving its financial performance. The tenure of CEOs, or the length of time they have held their position, is often cited as a key factor in their ability to lead the company effectively. Prior studies have documented the association between CEO tenure on earnings management (Ali and Zhang, 2015), firm performance (Hambrick and Fukutomi, 1991; Henderson et al., 2006), corporation social responsibility (CSR) performance (Chen et al., 2019), and audit fees (Mitra et al., 2020). Despite an active stream of research on how CEO tenure affects corporate behaviors, the influence of CEO tenure on investors' risk assessments of the Cost of Equity (COE) capital has not been thoroughly examined.

To test this prediction, we use the EXECUCOMP database and define CEO tenure as the number of years a CEO has held the CEO position in a company. To proxy for the COE, we use four measures of the

implied cost of equity that are most common in the literature, as well as their composite measure (e.g., Gebhardt et al., 2001; Gode and Mohanram, 2003; Botosan and Plumlee, 2005; Pástor et al., 2008; Botosan et al., 2011; Li et al., 2013).[1] These implied COE measures are estimated as an internal rate of return within various valuation models.

We examine whether investors require higher COE for firms with CEOs in their early tenure and find that CEO tenure is negatively associated with COE, suggesting that investors recognize the impact of CEO tenure on various outcomes. Consequently, they require a higher COE for firms with CEOs in their early tenure.

This study provides valuable contributions to the existing literature in two distinct and significant ways. First, we contribute to the existing body of research by highlighting the systematic differences between CEOs during their early and later years in office, specifically in relation to the cost of equity. Our study contributes to the existing literature by offering a groundbreaking examination of the differential impact of CEO tenure on the COE. Notably, our research fills a crucial gap in the literature as the first empirical research to establish a direct link between CEO tenure and the COE. This finding has important implications for investors, who should be aware of the potential risks associated with CEOs in their early years in office, and that they may be more willing to take on riskier projects.

Second, this study contributes to the literature on CEO tenure. While there have been several studies on the effects of CEO tenure on earnings management, firm performance, CSR performance, and audit fees (Hambrick and Fukutomi, 1991; Miller and Shamsie, 2001; Henderson et al., 2006; Ali and Zhang, 2015; Chen et al., 2019; Mitra et al., 2020), there has been no research on how investors assess CEO tenure in deciding the level of COE. Our study provides new insights into this important question and enhances our understanding of the cost of equity in the early and later tenure of CEOs in office.

The remainder of this paper is organized as follows. Section 2 reviews prior literature related to the CEO tenure and implied COE and develops our hypothesis. Section 3 explains our variable measurements and research design. In Section 4, we report our descriptive statistics and provide the results from cross-sectional validation tests. Section 5 discusses the results of robustness checks. Finally, Section 6 concludes the paper.

HYPOTHESIS DEVELOPMENT

CEO tenure, which refers to the time they spend in the CEO position, holds significant importance in CEO research. Throughout their tenure, CEOs make decisions that can impact the success or failure of their companies. Early conceptual research on CEO tenure focused on the various stages or phases of CEO tenure (Hambrick and Fukutomi, 1991). Expanding upon these foundations, researchers have undertaken an extensive exploration of diverse themes and areas pertaining to CEO tenure.

Prior studies on CEO tenure offers significant insights into several key aspects. First, CEOs in the early stages of their tenure are often subject to market perceptions that cast doubt on their leadership capabilities, attributing relatively low abilities to their limited experience and knowledge within the executive realm (Fama, 1980; Holmstrom, 1982; Gibbons and Murphy, 1992). This perception stems from the expectation that CEOs need time to develop the skills and expertise necessary for effective leadership. Second, the early tenure period is associated with heightened career concerns among CEOs (Holmstrom, 1982; Gibbons and Murphy, 1992; Oyer, 2008). These concerns can manifest in opportunistic behaviors, such as earnings overstatement, as CEOs strive to enhance their professional reputation and advance their career (Ali and Zhang, 2015). This behavior is driven by the desire to signal competence and secure future career opportunities. Lastly, CEOs with shorter tenures exhibit a greater propensity for risk-taking and subsequently become more risk-averse as their tenure progresses (Hambrick and Fukutomi, 1991; May, 1995; Berger et al., 1997; Coles et al., 2006; Chakraborty et al., 2007). This inclination can be attributed to their limited exposure to diverse organizational challenges and their relatively lower familiarity with the intricacies of the business environment. The early tenure CEOs are more willing to take risks as they seek to make a mark and demonstrate their capabilities to stakeholders.

Gibbons and Murphy (1992) argue that there is a general lack of certainty in the market regarding the competence of newly appointed CEOs. They point out that even when a CEO is promoted from within the organization, there is still uncertainty because the skills necessary to be a successful CEO differ from those required at lower-level positions. In addition, there are a number of studies that examine the career concerns of CEOs in their early tenure. These studies posit that if CEOs report poor outcomes during the initial stages of their tenure, they tend to get labeled as "low-ability" managers. As a consequence, their entire career tends to suffer adverse consequences (Holmstrom, 1982; Oyer, 2008).

Ali and Zhang (2015) assert that there is a tendency in the market to perceive CEOs who have spent a long duration with their respective firms as more skilled compared to those with shorter tenures. They suggest that CEOs with longer tenures are more inclined to safeguard their reputation, leading to a reduced likelihood of engaging in opportunistic behavior. Notably, their research unveils a pattern wherein earnings overstatement is more pronounced in the early years of CEOs' service, potentially driven by career concerns and a strategic endeavor to positively influence the market's perception of their performance.

In addition, extensive research has been conducted in the fields of accounting, finance, and management to investigate CEO behavior and decision-making. Among the various aspects examined, the risk-taking behavior of CEOs, particularly during their early tenure versus late tenure, has attracted significant attention. According to May (1995), CEOs who have been in their positions for a longer period of time tend to have a greater amount of human capital invested in their firms. These CEOs typically possess less diversified human asset portfolios, resulting in reduced motivation to pursue high-risk projects. He also presents evidence indicating that as the level of human capital invested in the firm increases, there is a greater incentive to minimize firm-specific risk. Similarly, Chakraborty et al. (2007) have found that the sensitivity of risk-taking to convexity decreases as CEO tenure lengthens. Berger et al. (1997) also argue that CEOs with longer tenures and higher cash compensation tend to become entrenched in their positions and are inclined to avoid risk altogether. Additionally, Coles et al. (2006) have discovered a significant negative relationship between CEO tenure, firm size, market-to-book ratio, and firm risk. This finding suggests that CEOs with shorter tenures have greater incentives to invest in riskier projects and implement more aggressive financial policies.

Overall, these studies shed light on the intricate dynamics between CEO tenure and risk-taking behavior and provide valuable insights into the decision-making processes of chief executives. In general, prior studies related to CEO tenure and risk-taking behavior indicate that CEOs in the early stages of their tenure have a greater inclination toward risk-taking when compared to CEOs who have been in their positions for a longer period of time. Hence, we construct our hypothesis as follows:

H1: *CEO tenure is negatively associated with the cost of equity capital.*

RESEARCH DESIGN

Measurement of Implied COE

We use the implied COE as a measure of the cost of equity. COE is ex-ante well specified as a proxy for expected returns, which is defined as the internal rate of return that equates the current stock price with the present value of expected future cash flows (Gebhardt et al., 2001; Gode and Mohanram, 2003; Botosan and Plumlee, 2005; Pástor et al., 2008; Botosan et al., 2011; Li et al., 2013). Pástor et al. (2008) and Chava and Purnanandam (2010) show that COE is more useful than realized returns in capturing the time-series relation of the risk-return trade-off, supporting the use of COE. Balakrishnan et al. (2021) also explain that COE utilizes analysts' forecasts, more reliable proxies of future firm performance that are directly available without any additional assumptions. Furthermore, COE is a good measure of expected stock returns as it is more likely to reflect information related to expected stock returns rather than stock mispricing. We, therefore, primarily use COE to measure the cost of equity in our tests.

Prior studies have used various models to estimate COE, with no consensus on the best measure (Botosan and Plumlee, 2005; Guay et al., 2011). In addition, there is nontrivial variation in the magnitude of the associations between COE measures and individual risk proxies, which could lead to spurious

conclusions. For the validity and credibility of the measure, we estimate four types of specifications (*COE_GLS*, *COE_CT*, *COE_MPEG*, and *COE_OJN*), most commonly used in the accounting and finance literature. In the four models, analysts' earnings forecasts are primarily used to measure expected future earnings. In our analyses, we primarily use the composite measure *COE_AVG*, which represents the equal-weighted average of the four individual measures of the cost of equity mentioned above. This approach is adopted because the four measures are based on different valuation models and assumptions regarding forecast horizons and short- and long-term growth rates (e.g., Botosan and Plumlee, 2005; Guay et al., 2011; Breuer et al., 2018).

Empirical Analysis

We estimate the following regression model with year and industry fixed effects controlled and standard errors clustered at the firm level:

$$\begin{aligned} COE\_AVG_{i,t} = {} & \beta_0 + \beta_1 CEO\_Tenure_{i,t-1} + \beta_2 Beta_{i,t-1} + \beta_3 Size_{i,t-1} + \beta_4 MtB_{i,t-1} + \beta_5 AQ_{i,t-1} + \\ & \beta_6 Std\_CFO_{i,t-1} + \beta_7 Std\_Sales_{i,t-1} + \beta_8 OPCycle_{i,t-1} + \beta_9 PNEarn_{i,t-1} + \\ & \beta_{10} Int\_Capital_{i,t-1} + \beta_{11} Int\_Intangible_{i,t-1} + \beta_{12} D\_Intangible_{i,t-1} + \\ & \beta_{13} AF\_Opt_{i,t-1} + Year\ Fixed + Industy\ Fixed + \varepsilon_{i,t} \end{aligned} \quad (1)$$

The dependent variable, *COE_AVG*, is the mean value of the implied cost of equity measures, *COE_GLS*, *COE_CT*, *COE_MPEG*, and *COE_OJN*. The variable of interest, *CEO_Tenure*, represents the number of years a CEO has held the CEO position in a company. If firms with longer CEO Tenure experiences a lower cost of equity, the coefficient of *CEO_Tenure*, β_1, should be negative.

We control for various factors that prior research identifies as being related to the cost of equity. First, we control for the well-documented three risk factors (*Beta*, *Size*, and *MtB*) that are known to affect the cost of equity (Sharpe, 1964; Lintner, 1965; Fama and French, 1992). *Beta* is estimated from a regression of daily stock returns on the value-weighted market returns over 250 trading days (a minimum of 200 trading days are required), ending at the end of the last fiscal year. *Size* and *MtB* are the firm size and market-to-book ratio, respectively, at the beginning of the fiscal year. We control for accruals quality (*AQ*), which can be related to a firm's cost of equity (Francis et al., 2004; Kim and Qi, 2010; Ogneva, 2012).[2] *AQ* is measured as in Dechow and Dichev (2002) and McNichols (2002).

We view CEO tenure as a distinct dimension of the corporate information environment that facilitates investors in cross-sectionally comparing multiple firms. One might argue, however, that the effect of CEO tenure on the cost of equity is subsumed by the effects of other attributes because firms with more favorable earnings attributes could have a lower cost of equity than firms with less favorable characteristics. To address this issue, following Francis et al. (2004), we include the following innate determinants of earnings attributes to ensure that the effect of CEO tenure on the cost of equity is distinct from the effects of other accounting attributes: cash flow volatility (*Std_CFO*), sales volatility (*Std_Sales*), operating cycle (*OPCycle*), historical loss (*PNEarn*), capital intensity (*Int_Capital*), intangible intensity (*Int_Intangible*), and an intangible indicator (*D_Intangible*).[3] We also include a variable to represent analyst forecast properties. Prior studies on the cost of equity document that the optimism bias in earnings forecasts could lead to imprecise computations of the implied cost of equity (McInnis, 2010; Hou et al., 2012; Mohanram and Gode, 2013; Ding et al., 2015). We, therefore, control for analyst forecast optimism (*AF_Opt*), i.e., signed analyst forecast error. Further, we include year-fixed effects in our analyses to control for market-wide macroeconomic effects on the cost of capital (Ding et al., 2015). Finally, we include industry fixed effects, which take into account the effect of industrial competition on the cost of capital. We cluster-adjust standard errors across firms (Armstrong et al., 2011; Lambert et al., 2012). The definitions and measurements of the control variables are detailed in the Appendix.

RESULTS

Descriptive Statistics

To estimate the four measures of the implied cost of equity, we obtain analyst earnings and growth forecasts from the I/B/E/S unadjusted detail file. We collect CEO tenure from EXECUCOMP, accounting data from COMPUSTAT, and stock-related data from CRSP. We exclude utility and financial industries from our sample because of their highly regulated environment. The intersection of required variables on the COE, CEO tenure, and controls yields 29,519 firm-year observations from 1993 to 2021. Table 1 displays the descriptive statistics of the variables.

TABLE 1
SUMMARY STATISTICS (N=29,519)

Variable	Mean	STD	25%	Median	75%
COE_AVG	0.1105	0.0445	0.0851	0.1029	0.1266
CEO_Tenure	4.2736	4.0887	1.0000	3.0000	6.0000
Beta	1.2297	1.2266	0.5427	1.1024	1.7732
Size	7.8956	1.5498	6.7915	7.7584	8.8784
MtB	0.4533	0.4721	0.2297	0.3834	0.5907
AQ	0.0134	0.0151	0.0048	0.0098	0.0174
Std_CFO	0.0665	0.5353	0.0271	0.0425	0.0662
Std_Sales	0.2122	0.7759	0.0894	0.1487	0.2451
OPCycle	4.5797	0.7300	4.2157	4.6539	5.0341
PNEarn	0.1610	0.2180	0.0000	0.1000	0.2222
Int_Capital	0.2975	0.2403	0.1030	0.2179	0.4465
Int_Intangible	0.0751	0.7125	0.0000	0.0177	0.0711
D_Intangible	0.3147	0.4644	0.0000	0.0000	1.0000
AF_Opt	0.0037	0.0902	0.0004	0.0009	0.0021

This table provides the sample distribution of variables used in the analysis. The full sample includes 29,519 firm-year observations over the period 1993-2021. All variables are defined in the Appendix. All continuous variables are winsorized at the top and bottom 1% level.

Table 1 presents descriptive statistics for the variables used in the empirical analysis. The mean (median) value of *COE_AVG* is 11.05% (10.29%). The standard deviation of the implied cost of equity is about half of its mean and median values, indicating substantial variation across firm-year observations. Table 1 also shows descriptive statistics for CEO tenure and control variables. The mean and median of CEO tenure are 4.2736 and 3.0000, respectively. In our sample, a CEO holds the position for about three to four years on average. Control variables are comparable with those in the literature (Francis et al., 2004; 2008). For example, the mean (median) value of accruals quality (*AQ*) is 0.0134 (0.0098), similar to 0.016 (0.012) found by Francis et al. (2008). The distributions for innate determinants of earnings attributes are also similar to those reported by Francis et al. (2004). The standard deviations of all control variables suggest they vary considerably across firms.

Table 2 tabulates the Spearman (Pearson) correlation matrix above (below) the diagonal for the variables used in the analysis. Both Spearman and Pearson correlations of CEO tenure and *COE_AVG* are negative and significant. As discussed in Fama and French (1992), the variables related to risk factors, including *Beta*, *Size*, and *MtB*, are correlated with the measure of the implied cost of equity in the expected directions. Consistent with Bhattacharya et al. (2012), *AQ* is positively correlated with the *COE_AVG*.

TABLE 2
SPEARMAN (PEARSON) CORRELATION COEFFICIENTS

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*
(1) COE_AVG	1.00	-0.12***	0.06***	-0.18***	0.15***	0.05***	0.07***	0.11***	0.03***	0.07***	0.12***	-0.12***	0.06***	0.22***
(2) CEO_Tenure	-0.11***	1.00	0.00	0.13***	-0.02***	0.04***	-0.06***	-0.06***	0.00	-0.09***	-0.05***	0.02***	-0.02***	-0.11***
(3) Beta	0.04***	-0.01	1.00	-0.11***	0.02***	0.05***	0.17***	0.10***	0.06***	0.19***	-0.09***	0.11***	-0.09***	0.10***
(4) Size	-0.18***	0.12***	-0.10***	1.00	-0.28***	-0.11***	-0.41***	-0.32***	-0.05***	-0.40***	0.11***	-0.06***	0.00	-0.30***
(5) MtB	0.00	0.00	0.06***	-0.02***	1.00	0.00	-0.14***	-0.07***	0.00	0.02***	0.20***	-0.26***	0.20***	0.30***
(6) AQ	0.04***	-0.02***	0.02***	-0.10***	0.00	1.00	0.22***	0.14***	0.14***	0.22***	-0.13***	0.13***	-0.12***	0.08***
(7) Std_CFO	0.03***	-0.02***	0.02***	-0.07***	0.00	0.12***	1.00	0.50***	0.09***	0.44***	-0.32***	0.32***	-0.17***	0.15***
(8) Std_Sales	0.04***	-0.02***	0.02***	-0.09***	0.00	0.04***	0.42***	1.00	-0.07***	0.20***	-0.28***	0.10***	-0.10***	0.02***
(9) OPCycle	0.01***	0.00	0.04***	-0.02***	0.00	0.05***	0.00	-0.07***	1.00	0.04***	-0.26***	0.35***	-0.30***	-0.05***
(10) PNEarn	0.08***	-0.09***	0.15***	-0.39***	0.00	0.14***	0.11***	0.07***	0.03***	1.00	-0.19***	0.26***	-0.12***	0.35***
(11) Int_Capital	0.08***	-0.03***	-0.06***	0.09***	0.01**	-0.09***	-0.04***	-0.06***	-0.30***	-0.18***	1.00	-0.48***	0.36***	0.21***
(12) Int_Intangible	0.00	0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.05***	0.02***	-0.01	1.00	-0.83***	-0.10***
(13) D_Intangible	0.05***	-0.03***	-0.07***	-0.01***	0.00	-0.04***	-0.03***	-0.01***	-0.23***	-0.15***	0.43***	-0.01*	1.00	0.13***
(14) AF_Opt	0.00	-0.01	0.03***	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	1.00

This table shows the Spearman (Pearson) correlation coefficient above (below) the diagonal for the variables used in the multivariate tests. All variables are defined in the Appendix. Superscripts ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively.

CEO Tenure and COE

Column (1) of Table 3 presents the results from estimating Equation (1), which examines the effect of CEO tenure on the COE. The estimated coefficient on *CEO_Tenure* is -0.0003, and this is significant at the 1% level. The effect of CEO tenure on the COE is economically significant since a one-standard-deviation increase in *CEO_Tenure* is associated with a 12-basis-point decrease in the cost of equity for *COE_AVG*.[4] Therefore, this result provides strong evidence that the cost of equity declines as a firm's management has longer tenure, supporting our argument.

Regarding the control variables, the results are generally consistent with evidence from prior studies. For example, the cost of equity is positively related to the market beta (*Beta*) and the market-to-book ratio (*MtB*), but negatively related to firm size (*Size*). The results on accounting attributes are generally consistent with Francis et al. (2004). For example, *AQ* is positively and significantly related to the implied cost of equity, indicating that the implied cost of equity is higher for firms with low accruals quality. *PNEarn* and *Int_Capital* have positive coefficients, meaning that the implied cost of equity is higher for firms with a more frequent negative earnings and higher capital intensity. We also examine variance inflation factors (VIFs) to check for possible multicollinearity problems between explanatory variables. All VIF values fall below 10, which indicates no presence of multicollinearity.

Overall, the findings in Table 3 show that CEO tenure is negatively associated with the implied cost of equity beyond previously identified risk factors, other firm fundamentals, and earnings attributes.

TABLE 3
EFFECT OF CEO TENURE ON COST OF EQUITY

	COE_AVG				
	(1)			(2)	
	est.	**t-stat.**	***VIF***	**est.**	**t-stat.**
Constant	0.0869***	(13.47)		0.0769***	(5.25)
CEO_Tenure	**-0.0003*** **	**(-3.60)**	1.02	**-0.0003*** **	**(-3.57)**
Beta	0.0018***	(6.46)	1.05	0.0019***	(6.62)
Size	-0.0021***	(-7.64)	1.22	-0.0016***	(-2.87)
MtB	0.0074***	(6.78)	1.15	0.0075***	(6.76)
AQ	0.0772***	(3.84)	1.12	0.1014***	(4.07)
Std_CFO	-0.0008	(-0.87)	1.57	-0.0008	(-0.92)
Std_Sales	0.0007	(1.25)	1.58	0.0007	(1.25)
OPCycle	0.0016	(1.56)	1.14	0.0011	(1.03)
PNEarn	0.0196***	(7.23)	1.23	0.0167***	(4.50)
Int_Capital	0.0063**	(2.02)	1.31	0.0057*	(1.75)
Int_Intangible	0.0004	(0.23)	1.03	0.0004	(0.19)
D_Intangible	0.0015	(1.50)	1.25	0.0011	(0.97)
AF_Opt	-0.0001	(-0.02)	1.00	-0.0004	(-0.11)
IMR				0.0159	(0.82)

Year Fixed	Yes	Yes
Industry Fixed	Yes	Yes
# of obs (N)	29,519	29,519
Adj. R^2	0.2755	0.2759

This table reports the results from the regression of managerial ability on the cost of equity. All variables are defined as in the Appendix. T-statistics in parentheses are based on the standard errors clustered at the firm level. Superscripts ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively.

ROBUSTNESS CHECK

Endogeneity Issue

CEO_Tenure is observed only for firms in EXECUCOMP (S&P 1000 firms), which may introduce sample selection bias. Therefore, by applying the Heckman two-step procedure, we estimate the inverse Mills' ratio (*IMR*) from a probit regression. In detail, we use *DCEO_Tenure* (1 if *CEO_Tenure* is available, 0 otherwise) as our dependent variable and all control variables in Equation (1) for the probit regression. We estimate *IMR* and incorporate this in Equation (1). As in column (2) of Table 3, we find that *CEO_Tenure* is negatively related to *COE_AVG*.

In the previous tests, we include various firm characteristics to control for the effect of potentially correlated omitted variables. However, some characteristics including firm size would affect both our dependent and independent variables, which motivates us to further consider endogeneity problems. To address these concerns, we use a two stage least square regression model (2SLS). Our instrumental variable, *Median CEO_Tenure*, is median of CEO tenure in the same industry. This variable is associated with the *CEO_Tenure* of each company in our sample. On the other hand, there is no reason that *Median CEO_Tenure* is related to COE. Our unreported results show that our results are robust to potential omitted variables such as time-invariant firm characteristics. In sum, our sensitivity analyses alleviate, albeit not completely, some of the endogeneity concerns in our results.

CONCLUSION

This study examines whether CEO tenure affects a firm's level of implied COE. We find robust evidence that CEO tenure is negatively related to implied COE. The results are robust to change analyses and firm-fixed specifications such that correlated omitted variables are not the driver of this relation. This study contributes to the literature by highlighting the systematic differences between CEO tenure and the COE. This finding has important implications for investors, who should be aware of the potential risks associated with CEOs in their early years in office, and that they may be more willing to take on riskier projects.

ENDNOTES

1. For brevity, we only report results using the composite measure. Results using the individual measures are available upon request.
2. Using a time-series asset pricing model, Francis et al. (2005) show that accruals quality is a priced risk factor, but Core et al. (2008) suggest that accruals quality is not a priced risk factor when a two-stage cross-sectional regression is used. However, several subsequent studies show that accruals quality is priced under the two-stage cross-sectional regression framework after controlling for penny stocks (Kim and Qi, 2010) or cash flow shocks (Ogneva, 2012).
3. Following Francis et al. (2004), we include an intangible indicator (*D_Intangible*) to control for the zero values of R&D expenses and advertising expenses.
4. We compute these basis point changes by multiplying the estimated coefficient on *CEO_Tenure* by the standard deviation (see Table 1) of *CEO_Tenure*.

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APPENDIX: VARIABLE DEFINITIONS

Variable name	Variable explanation
COE_GLS	Implied cost of equity capital estimated using the GLS Model (Gebhardt et al., 2001).
COE_CT	Implied cost of equity capital estimated using the CT Model (Claus and Thomas, 2001).
COE_MPEG	Implied cost of equity capital estimated using the MPEG Model (Easton, 2004).
COE_OJN	Implied cost of equity capital estimated using the OJN Model (Ohlson and Juettner-Nauroth, 2005).
COE_AVG	The average of *COE_GLS*, *COE_CT*, *COE_MPEG*, and *COE_OJN*.
CEO_Tenure	The number of years a CEO has held the CEO position.
Beta	Market model's beta, which is estimated from a regression of daily stock returns on the value-weighted market returns over 250 trading days (minimum 200 trading days are required), ending at the end of the last fiscal year.
Size	Natural logarithm of the market value of equity at the beginning of the fiscal year.
MtB	Market-to-book ratio, which is measured as the natural logarithm of the ratio of the market value of equity to the book value of equity at the beginning of the fiscal year.
AQ	Accrual quality, calculated, using a modification of the Dechow and Dichev (2002) model, as the standard deviation of residuals from firm-specific regressions of total current accruals (TCA) on the current-, lag-, and lead-period cash flows from operation; changes in revenues (REV); and property, plant, and equipment (PPE) over the last 10 years (at least prior 3 years data required).
Std_CFO	The standard deviation of cash flows from operation over the last 10 years (at least prior 3 years data required).
Std_Sales	The standard deviation of sales over the last 10 years (at least prior 3 years data required).
OPCycle	Operating cycle, measured as the logarithm of the sum of days taken in selling and days taken in recovering the cash.
PNEarn	The proportion of negative earnings over the previous 10 years.
Int_Capital	Capital intensity, calculated as the ratio of the net book value of property, plant, and equipment to total assets.
Int_Intangible	Intangibles intensity, which is measured as the sum of R&D expenses and advertising expenses, deflated by sales.
D_Intangible	Intangibles indicator, which equals one if *Int_Intangible*=0, and 0 otherwise.
AF_Opt	Analyst earnings forecast optimism, calculated as the median consensus annual earnings forecast issued prior to the annual earnings announcement minus actual earnings, scaled by the stock price at the beginning of the fiscal year.