CEO Labor Market Incentives and Cost of Equity Capital

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Abstract

We examine how tournament incentive in the external labor market motivates CEOs influence firms' cost of equity capital. Using a large sample of firms over 1992-2019, we find that firms with higher tournament incentivized CEOs exhibit lower cost of equity capital. The association is strong and robust through alternative measurements of tournament incentives and cost of equity incentive, and endogeneity alleviation. Further evidence indicates that the negative association between CEO tournament incentive and cost of equity capital is moderated by CEOs' upward immobility but more pronounced in weaker external monitoring settings, cash-richer firms and in firms that are in the early stages of product life cycle. Our path analysis demonstrates that firm performance acts as a mediator in the relationship, suggesting that external labor market incentive motives the CEO to exert extra efforts, consequently enhancing firm performance. Overall, our findings provide evidence that CEO external labor market incentive has a positive impact on cost of equity capital.

Key words: CEO tournament incentive, External labor market, Cost of equity capital; upward immobility, external monitoring

1. Introduction

One type of incentives that motivates CEOs in making different managerial decision is to keep their upward or intra-industry mobility in the external labor market. This external labor market provides CEOs strong incentives to deliver outstanding performance due to the attractiveness of high compensation, enhanced span of control, high visibility, and status as CEO of a leading company in the industry (Coles, Li and Wang 2018). CEOs deems this industry tournament

incentive (ITI) as more important than their compensation scheme at their current firms in making decisions by over 75% CEOs in a survey of U.S. companies (Graham, Harvey, and Rajgopal 2005).

Research on CEO ITI indicates that the dynamics of the external labor market have impact on a company's internal policies and strategies. This is because CEOs may be driven to adopt decisions at the firm level that enhance their visibility in the labor market (Kubick and Lockhart, 2016; Coles et al., 2018; Huang, Jain, and Kini, 2019). For examples, concurrent research find that CEOs ITI are associated with firms financial performance (Coles et al., 2018), cash holding policies (Huang et al., 2019), accounting techniques (Chowdhury, Hodgson, and Pathan 2020), and audit fees that are closely tied to the perceived risk of firm and agency problems (Tan 2021). While this stream of research have acknowledged ITI's substantial role in influencing a CEO's decision-making, the link between CEO ITI and cost of equity capital has not been explored, an area our study seeks to address.

The cost of equity capital (COEC) summarizes an investor's risk-return trade-off in their resource allocation decision (P´astor, Sinha, and Swaminathan (2008), and is a key benchmark used by investors, managers, analysts, and all the other stakeholders to evaluate the risk and return of investment. Extant research shows that CEOs incentives have significant influences on the firms' COEC (e.g. Chen, Huang and Wei 2013; Chen, Li and Zhou 2016; Shen and Zhang 2020). However, the literature in examining determinants of COEC has ignored the influence from CEO ITI, such an important incentive, and there is no empirical evidence on whether CEO ITI affects firms' COEC. Understanding how CEO labor market incentives impact the cost of equity capital is important because the cost of equity capital is one of the

key considerations for managers in their capital budgeting and corporate financing decisions, and it is deemed as a more direct yardstick of corporate investment and financing decisions than is firm valuation (Cao, Myers, Myers and Omer, 2015). If these incentives are structured in a way that optimizes the cost of equity capital, it can lead to better overall financial performance and shareholder value. In this study, we aim to investigate the relation and fill this gap in literature.

The effect of CEO labor market incentive on COEC can be either positive or negative. On the one hand, moving-upward desire incentivizes labor to provide effort, and that the provision of effort is expected to increase with the size of the tournament prize (Lazear and Rosen, 1981). On the other hand, external employment opportunity can induce greater risk-taking, as labor may attempt to improve their chances of winning the promotion tournament by making risker decisions (Kini and William 2011). Regardless of winning through working hard or taking risks on behalf of shareholders, CEOs' labor market incentive can have significant impacts on COEC. The efforts-making theory predicts a negative relation between CEO ITI and COEC because working hard can improve firm performance and investors will be willing to require a lower rate of return. While, the risk-taking theory predicts a positive relation between CEO ITI and COEC because risk is a fundamental determinant of COEC and higher risk is expected to lead to a higher required rate of return by equity holders. We therefore present our research questions in a null hypothesis that there is no relation between CEO labor market incentives and cost of equity capital.

We follow Coles et al. (2018) and Kubick and Lockhart (2016) to measure CEO ITI by the difference between the second-highest CEO's total compensation in the industry and the focal

CEO's total compensation, and adopt an average value of COEC across four accounting-based valuation models for predicting the implied COEC as the main measure of COEC. Using a large sample of firms from 1992-2019, we find that higher CEO ITI are negatively associated with firm-level COEC. The findings are consistently robust across each of the four COEC models as well as two alternative measures of ITIs.

To alleviate the endogeniety concerns, we construct two instrumental variables and employ two-stage regressions by using the Generalized Method of Moments (GMM) estimator (Brockman et al., 2010) to rerun the regressions. Our instruments pass a series of validity tests and the regression results suggest that the link between CEO ITIs and the COEC continues to be negative and statistically significant, even after accounting for the endogeneity of industry tournament incentive.

We further investigate whether older CEOs and CEOs with less promotion opportunities when the number of higher paid CEO positions in the industry is small, indicating upward immobility, are less incentivised to reduce cost of equity capital; whether CEOs are more responsive to external labor market incentives in reducing cost of equity capital when corporate governance is weaker, when cash is richer in the firms and when firms have more growing opportunities in the early stages of product life cycle. We find that the negative association between CEO ITI and COEC is moderated by CEOs' upward immobility but more pronounced in weaker external monitoring settings, cash-richer firms and in firms that are in the early stages of product life cycle. Overall, the results, consistent with our main findings, suggest that CEOs incentivised by higher external labor market opportunity are more likely to exert higher efforts and achieve lower cost of equity capital.

To corroborate our findings, we employ a path analysis to demonstrate that firm performance acts as a mediator in the relationship between CEO ITI and COEC. We employ two measures of firm performance, namely, Tobin's q and return-on-assets, as mediator variables in our path analysis, and expect that external labor market incentive motives the CEO to exert extra efforts, consequently enhancing firm performance. The results collectively suggest that there exists a reliable mediated link via firm performance between CEO ITI and COEC.

To the best of our knowledge, our study is the first to examine the effects of CEO labor market incentive in the industry on cost of equity. It makes three main contributions. First, a growing stream of literature examines the effects of CEO tournament incentives on corporate behavior and firm value. Kubick et al. (2016) find that external labor market incentives motivate CEOs to adopt more aggressive tax policies. Coles et al. (2018) find that external labor market incentives are positively associated with firm performance, firm risk, and the riskiness of firm investment and financial policies. Our study extends the research on CEO labor market incentives to a fundamental determinants of firm policies, the cost of equity.

Second, it contributes to the literature on the determinants of firms' cost of capital. Traditionally, literature relies on standard firm-specific characteristics in explaining the cost of equity, including measures of firm riskiness, measures of the quality of information environment, firm size, and other factors related to firm performance, etc. (Francis et al. 2005; John et al. 2008; Bernile et al. 2017). However, despite that the many of these firm characteristics are directly influenced by CEOs, there are only sparse literature examining whether CEO's personal incentives affect cost of equity. Ours, taking the perspective of industry tournament incentive facing the CEOs, complements this stream of research by

investigating another important CEO personal incentive into the research on determinants of cost of equity capital.

Third, this study contributes to the literature on CEO tournament incentives and provides a linkage between their tournament incentive and cost of equity. It delves into how the competitive dynamics within an industry, specifically the competition among firms to attract and retain top executives, impact the perceived risk and thus the cost of equity capital for these firms. Answering this question is important as it ties together elements of corporate finance, executive compensation, and market perception, offering insights into how internal corporate strategies and market competition can influence a firm's financial standing and investment attractiveness.

2. Sample, Variable Measurement and Research Design

2.1 *Sample selection and data sources*

We begin assembling our sample by downloading all CEO compensation data from ExecuComp database[1] and accounting data from Compustat North America database. We collect analyst earnings forecasts and stock prices used to calculate the cost of equity capital from the Institutional Brokers' Estimate System (I/B/E/S) and Center for Research in Security Prices (CRSP). We exclude firms from the financial (SIC 6000-6999) and utility (SIC 4900-4999) industries. We further require non missing data for firm-level variables in our main regression model, reducing the sample to 18,164 firm-year observations from 1992 to 2019.

[1] The ExecuComp database covers all public firms in the S&P 1500 index and firms that were previously included in the index. Representing 90% of the U.S. stock market capitalization, the S&P 1500 index includes all stocks in the S&P 500, S&P MidCap 400, and S&P SmallCap 600 indexes.

3.2 *Measure of Industry tournament incentive*

In line with Coles et al. (2018), we define industry tournament incentives (*ITI*) as the natural logarithm of the difference between the compensation of the CEO under consideration and the compensation of the second-highest paid CEO in the same industry as defined using the Fama-French 48 industry classification.

2.2 ***Measure of cost of equity capital***

We estimate a firm's cost of equity capital using the implied cost of equity. The implied cost of equity is the internal rate of return of a firm that equates the stock price of the firm to the present value of future cash flows to equity holders (Gebhardt et al., 2001). Literature points out that realized stock returns are a deficient proxy for firms' cost of equity capital (Fama and French, 1997; Elton, 1999). Compared with realized returns, the implied cost of equity explicitly controls for the variation in expected cash flows by design (e.g., Gebhardt et al., 2001; Hail and Leuz, 2006), and is a superior measure of expected returns (e.g., Elton, 1999; Pástor et al., 2008).

In our study, we deduce four individual estimates of the implied cost of equity measures from the models of Gebhardt et al. (2001) (*Cost of Equity GLS*), Claus and Thomas (2001)(*Cost of Equity CT*), Ohlson and Juettner-Nauroth (2005)(*Cost of Equity OJ*), and Easton (2004)(*Cost of Equity MPEG*). To ensure that our findings are not driven by a specific model's assumptions, we follow prior literature (e.g., Boubakri et al., 2012; Cao et al., 2015; Chen et al., 2016; Dhaliwal et al., 2016; Dhaliwal et al., 2011; Hail and Leuz, 2006, 2009) and conduct our

analyses using the average of the four individual implied cost of equity estimates (*COEC*).***3.3 Control Variables***

Following prior literature on the implied cost of equity capital, we include a comprehensive set of control variables that might affect a firm's implied cost of equity (e.g., Chen et al., 2016; Dhaliwal et al., 2016; Goh et al., 2016). In particular, to capture the factors that influence firm risk, we control for firm's market beta (*Beta*), size (*Size*), book-to-market ratio (*BM*), stock return volatility (*IVOL*), and leverage (*Leverage*). We control for the analyst forecast bias (*Forecast Bias*) and analyst forecast dispersion (*Forecast Dispersion*) since Gode and Mohanram (2013) show that firm's information environment affects cost of equity capital. Finally, we include price momentum (*MMT*), and long-term growth rates (*FLTG*), both of which may shift investors' required returns. To ensure our results are not driven by the other CEO characterises, We further control for the sensitivities of a CEO's wealth to changes in stock prices (*CEO Delta*), the sensitivities of an CEO's wealth to changes in stock volatility (*CEO Vega*), and the age (*CEO Age*), gender (*Female CEO*), and tenure (*CEO Tenure*) of a CEO. More details about variable definitions are available in Appendix A.

3. Main empirical results

3.1. Descriptive statistics

In Table 1, we report some descriptive statistics for all the variables used in our main empirical analyses. The sample period for our main regression model is 1992–2019. The mean value (standard deviations) of *COEC* is 6.291 (6.260). The summary statistics for the *COEC* closely resemble those reported in prior research (e.g., Chen et al. 2016; Shen and Zhang, 2020). The mean of the *ITI* is 9.378. Its standard deviation, 25th percentile, and 75th percentile are 0.993,

8.833, and 9.964, respectively, suggesting that the industry tournament incentives span a very wide range for our sample firms.

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3.2. Primary regression analysis

We examine the link between the industry tournament incentives and cost of equity in a multivariate framework by estimating this panel regression:

$$Cost\ of\ Equity(COE)_{j,t} = \beta_0 + \beta_1 Industry\ Tournament\ Incentives\ (ITI)_{j,t} + \Gamma' X_{j,T} + \mu_{j,t} + \varepsilon_{j,t} \quad (1)$$

where the dependent variable *Cost of Equity(COEC)* is the average of four implied cost of equity estimations (Gebhardt et al. (2001) (*Cost of Equity GLS*), Claus and Thomas (2001) (*Cost of Equity CT*), Ohlson and Juettner-Nauroth (2005) (*Cost of Equity OJ*), Easton (2004) (*Cost of Equity MPEG*) in excess of the risk-free rate in percentage. Our independent variable of interest is industry tournament incentives (*ITI*). *X* is a vector of control variables described in Section 3.3. In the regressions, we include year times industry ($\mu_{j,t}$) fixed effects to control for the unobserved heterogeneity across industries each year. We rely on the standard errors with firm clustering, which are heteroskedasticity-consistent and account for the potential correlation of error terms within each firm.

Table 2 provides the estimation results of regression equation (1). In column (1), we regress cost of equity (*COEC*) on industry tournament incentives (*ITI*) after controlling for a set of firm-level characteristics, year times industry fixed effects. The estimated coefficient for *ITI* is significantly negative at less than 1% significance level (t-statistic= -2.89). The estimated coefficients on the control variables are generally comparable with earlier studies (e.g., Chen et al., 2016; Dhaliwal et al 2016; Shen and Zhang 2020; Rjiba et al., 2021). We find that firms

with higher leverage, greater stock return volatilities, greater analyst forecast dispersion, and greater analyst forecast bias incur higher cost of equity capital. Recent studies suggest that some managerial traits are related to cost of equity capital (e.g., Chen et al,. 2015; Shen and Zhang 2020; Kannan-Narasimhan et al., 2023). Chen et al. (2015) find an inverse relationship between executives' delta and firms' cost of equity capital, while a positive association emerges between executives' vega and cost of equity. In a similar spirit, Kannan-Narasimhan et al. (2023) find that powerful founder CEOs is likely to raise the firm's cost of capital. In column (2), we estimate the full regression equation (1) by further controlling for a set of CEO-characteristic-related control variables. The estimated coefficient for *ITI* remains significant at less than 1% level (t-statistic=-3.19). The results indicate that industry tournament incentives are negatively associated with firm-level cost of equity capital. These findings are consistent with the view that higher industry tournament incentives can motivate CEOs to exert greater effort, thereby boosting firms' performance and reducing firms' cost of equity capital.

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3.3. Alternative measures of industry tournament incentives

We primarily measure the industry tournament incentives with industry being defined on the basis of Fama-French 48-industry classification scheme (FF48), which has been widely used in prior literature. Next, we examine the robustness of our primary findings by examining two alternative measures of industry tournament incentives based on the Fama-French 30-industry classification scheme (FF30) and Fama-French 12-industry classification scheme (FF12), respectively. We re-estimate our primary regression model by replacing the *ITI* with two alternative measures. We report the estimation results in Panel A of Table 3. Corroborating our main evidence, the coefficients on two alternative measures of industry tournament incentives are negative and highly significant in Columns (1)–(4), implying that our results still hold after using narrower industry classifications than FF48.

3.*4. Alternative measures of cost of equity*

In our primary regression analysis presented in 4.2, the dependent variable (*COEC*) is the average value of four alternative implied cost of equity estimates (i.e., *Cost of Equity GLS, Cost of Equity CT, Cost of Equity MPEG, Cost of Equity OJ*). To further test the robustness of our findings, we evaluate whether our baseline result is robust to using the individual cost of equity estimates. We re-estimate Equation (1) using these four alternative measures of cost of equity capital and report the results in Panel B of Table 3. The sign of *ITI* is unchanged across all four cost of equity capital specifications, and the *t*-statistics continue to demonstrate statistical significance.

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3.5. Endogeneity threats

Our evidence so far implies that the industry tournament incentives are negatively associated with cost of equity capital. However, this analysis is vulnerable to potential endogeneity between the industry tournament incentives and cost of equity capital for several reasons. For starters, although we control for observable firm characteristics in our main regressions, there might exist unobservable heterogeneity when omitted unobservable variables affect both the industry tournament incentives and cost of equity capital. Additionally, given that firms usually do not dramatically alter their compensation policies, the industry tournament incentives tend to be auto correlated across years. Our results could spuriously reflect potential endogeneity biases. Accordingly, in this section, we employ a two-stage regression using the Generalized Method of Moments (GMM) estimator (Brockman et al., 2010)[2] to alleviate endogeneity concern. Similar to Coles et al. (2018), Huang et al. (2019), and Lonare et al. (2022), we employ

[2] The two-stage GMM estimator we use provides efficient coefficient estimates and consistent standard error estimates. It is more efficient than the traditional two-stage instrumental variable (IV) or two-stage least squares (2SLS) estimators for models with endogenous variables.

two instruments for industry tournament incentives: the sum of total compensation received by all other CEOs in the same industry, excluding the highest-paid CEO, and the number of higher-paid CEOs in the same industry group for a given year. The first-stage results, reported in column (1) of Table 4, show that our instruments are both statistically significant, as expected. Further diagnostic tests, including the F-test for the joint significance of the instruments and the Hansen test for overidentification, confirm the validity of these instruments. In comparing the F-statistics with the critical values of Stock and Yogo (2005) for the weak instrument test, we reject the null hypothesis that our instruments are weak. In column (2), we report the results of second-stage regression estimating Equation (1) after replacing the independent variables of interest with their fitted values from the first-stage regressions. The coefficient estimates on instrumented *ITI* remain negative and statistically significant. In column (3) and column (4), we further control for a set of CEO-characteristic-related control variables and get similar findings, showing that the relationship between industry tournament incentives and cost of capital remains negative and statistically significant after controlling for the endogeneity of industry tournament incentives. Finally, we contrast the results of the second-stage regression with OLS estimation by performing the Hausman test. The Hausman test rejects the null that there is no endogeneity problem with the OLS estimation, indicating that the 2SLS estimation is preferred over the OLS estimation.

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4. Additional tests

4.1 The role of CEO upward mobility

In a survey conducted by Graham et al. (2005), which involved more than 400 CEOs, it was revealed that over 75% of respondents considered upward mobility in the labor market to be a more influential factor than compensation schemes in shaping managerial decisions. As older CEOs, especially CEOs close to retirement, has a lower likelihood of immediate promotion to

another firms in the same industry (also see Coles, Li, and Wang 2018, and Huang, Jiang, and Xie 2022), these CEOs have a decreased upward mobility. Besides, the upward mobility of CEOs is associated with the outside promotion opportunities. The promotion opportunities of CEOs increases with the number of higher paid CEO positions (i.e., the number of CEOs with higher total compensation) within the same industry. Therefore, the upward mobility of CEOs is higher if there are more CEOs with higher total compensation in the same industry. If industry tournament incentives indeed effective in altering a firm's cost of equity capital by motivating incumbent CEOs to exert more effort and dedication, we would anticipate that the impact would be less pronounced for CEOs who are less responsive to industry tournament incentives due to their immobility. In table 5, we revise our baseline model by including the *Older CEO Dummy* (*High HigherPaid Ind CEOs*) and its interaction term with *ITI* The *Older CEO Dummy* is a binary variable that equals one if a CEO's age is greater than or equal to the sample median, and zero otherwise. Similarly, *High HigherPaid Ind CEOs* is a binary variable that equals one if the total number of CEOs with higher total compensation within the same industry is greater than or equal to the sample median, and zero otherwise. Consistent with expectations, in Table 5, we find that the impact of industry tournament incentive is weaker for older CEOs and CEOs with less outside promotion opportunities. Our findings suggest that the impact of CEO industry tournament incentive on the cost of equity capital is less pronounced for CEOs who are less responsive to industry tournament incentives due to their upward immobility.

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4.2 Corporate governance

Industry tournament incentives motivate CEOs to deliver outstanding performance on behalf of shareholders (Coles, Li, and Wang 2018). Given that CEOs in firms with weak corporate governance are less motivated and with a preference for “quiet life” (Bertrand and

Mullainathan, 2003), the benefit of industry tournament incentive could be particular stronger for these firms. In this subsection, we employ two proxies for the external governance of a firm, namely: sale-based HHI index and hostile takeover index (Cain et al., 2017). We test how the impact of industry tournament incentive on cost of equity capital varies with the external corporate governance of firms. In Table 6, we augment our baseline model in Equation (1) by adding a *Low Competition Dummy* and its interaction term with *ITI* in column (1), and a *Low Hostile-Takeover Index Dummy* and its interaction term with *ITI* in column (2). *Low Competition Dummy* equals one if the sales-based HHI index of firm is higher than or equal to the sample median and zero otherwise. *Low Hostile-Takeover Index Dummy* equals one if hostile takeover index of a firm is higher than or equal to the sample median and zero otherwise. Consistent with our expectations, the coefficients on *ITI *Low Competition Dummy* and *ITI*Low Hostile-Takeover Index Dummy* are all negative and statistically significant, showing that the negative impact of industry tournament incentive on the cost of equity capital is particularly stronger for firm with weaker corporate governance mechanisms.

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4.3 The role of cash holdings

Huang, Jain, and Kini (2019) find that industry tournament incentives have the potential to alleviate agency conflicts and provide CEOs with risk-taking incentives to exploit the product-market benefits of cash holdings. Industry tournament incentives increase the value of cash by incentivizing CEOs to deploy cash strategically. Consequently, we expect the benefit of industry tournament incentives to be particularly stronger in cash-rich firms. In this subsection, we examines how the impact of industry tournament incentives on a firm's cost of equity varies with the cash holding of the firm. To measure the extent of cash holdings, we use two indicators: *High Cash-Holdings Dummy* and *High Industry-Adjusted-Cash-Holdings Dummy*. *High Cash-*

Holdings Dummy is an indicator variable that takes on a value of one if a firm's cash holdings ratio is greater than or equal to the sample median. Similarly, *High Industry-Adjusted-Cash-Holdings Dummy* is an indicator variable equals one if a firm's industry-adjusted cash-holdings ratio is higher or equal to the sample median. The industry-adjusted cash-holdings ratio for a firm is calculated by subtracting the industry-average ratio for the corresponding industry in a given year from its own cash holdings ratio.

In Table 7, we revise our baseline model in Equation (1) by including the *Low High-Holdings Dummy (High Industry-Adjusted-Cash-Holdings Dummy)* and its interaction term with *ITI*. As expected, in column (1) the coefficient on *High Cash-Holdings Dummy * ITI* is negative and significant. The results suggest that the negative impact of industry tournament incentives on cost of equity is stronger among firms with high cash holdings. In Column (2), we obtain similar results when we measure a firm's cash holdings using the *High Industry-Adjusted-Cash-Holdings Dummy*.

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4.4 The role of product life cycle.

A firm's prime input required and incentives to invest varies with its product life cycle (Abernathy and Utterback, 1978; Hoberg and Maksimovic, 2022). In this subsection, we explore how the impact of industry tournament incentives varies with the life cycle stages of a firm. We argue that industry tournament incentives, which encourage the adoption of riskier but value-enhancing corporate policies (Coles, Li, and Wang , 2018), could be particular valuable for firms in the early stages, as R&D and CAPX sensitivity are high early in the cycle (Hoberg and Maksimovic, 2022). However, in mature and declining phases, firms are more established with less growth opportunities, the benefit from industry tournament incentives become less obvious.

Hoberg and Maksimovic (2022) propose a novel 10-K text-based model of product life cycles. They construct a four-stage product lifecycle in accordance with Abernathy and Utterback's seminal work (1978). These stages are identified as follows: product innovation as Life-Cycle 1, process innovation as Life-Cycle 2, maturity as Life-Cycle 3, and decline as Life-Cycle 4. In Table 8, we augment our baseline model in Equation (1) by incorporating interaction terms between industry tournament incentives and four distinct product life cycle stages. The results corroborate our hypothesis that tournament incentives exhibit a heightened impact on cost of equity capital during the early phases of the product life cycle, but not the late phase.

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5. Path analysis

Literature suggests that the industry tournament incentives of a company induce more managerial effort and is positively associated with firm performance (Coles, Li, and Wang 2018; Huang Jain Kini 2019). In this section, we employ a path analysis to establish firm performance as a mechanism underlying the relation between industry tournament incentives and cost of equity capital. Specially, we investigate whether enhanced firm performance, the mediator variable driven by the industry tournament incentives, leads to a decrease in cost of equity capital. Higher industry tournament incentives enhance the effort and expected performance of incumbent CEOs. We expect that external industry pay gap motives the CEO to exert extra efforts, consequently enhancing firm performance (Coles et al. 2018). Improved firm performance indicates lower risk and higher expected future cash flows, in turn leading to a to a lower cost of equity capital over time. To perform the path analysis, we estimate a structural equation model (SEM) to decompose the relation between industry tournament incentives and cost of capital into a direct path and an indirect (mediated) path mediated by firm performance. The SEM estimation comprises two regressions: one that regress cost of

equity capital on industry tournament incentives and the mediating variable, firm performance, and another that regress firm performance on industry tournament incentives, with both regressions controlling for a list of variables included as control variables in Equation (1). The indirect effect of industry tournament incentives on cost of capital is estimated as the product of the effect of industry tournament incentives on the mediating variable and the effect of the mediating variable on cost of capital. We adopt Sobel's (1982) test statistics to determine the statistical significance of the direct and indirect effects. We adopt two alternative mediator variables as the proxies for a firm's performance. First, we employ Tobin's q as a proxy for firm performance. Similar to Gompers et al. 2003, we calculate Tobin's q as total assets minus the book value of equity plus the market value of equity, scaled by total assets. Panel A of Table 9 shows that industry tournament incentives have a negative and statistically significant direct effect on cost of equity capital, consistent with our main finding. In the mediated path analyses, we find that industry tournament incentives have a positive and statistically significant relation with Tobin's q, and Tobin's q has a significantly negative effect on cost of equity capital. More importantly, we find that the total indirect effect of industry tournament incentives on cost of equity capital, through Tobin's Q as a mediating variable, is statistically significant for cost of equity capital.

Second, we use return-on-assets (*ROA*) as our second mediator variable. Following Barber and Lyon(1996),we calculate *ROA* as net income divided by the book value of total assets. Panel B of Table 9 presents the results of our path analysis using *ROA* as a mediating variable. In the SEM, industry tournament incentives have a negative and statistically significant direct effect on cost of capital. The results of the mediated path analyses indicate that industry tournament incentives have a positive and statistically significant effect on the ROA, and ROA has a negative effect on cost of capital. The total indirect effect of the industry tournament incentives

on cost of capital, through ROA as a mediating variable, is statistically significant for cost of capital.

Taken together, the results tabulated in Table 9 collectively suggest that there exists a reliable mediated link via firm performance between industry tournament incentives and the cost of equity capital.

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6. Conclusion

In conclusion, our study represents a pioneering effort in exploring the influence of CEO labor market incentives, specifically industry tournament incentives (ITI), on the cost of equity capital (COEC). We have demonstrated through extensive research and robust analytical methods that higher CEO ITIs are associated with lower COEC in firms. This negative association persists even after addressing potential endogeneity concerns using instrumental variables and the Generalized Method of Moments estimator.

Our findings suggest that CEOs motivated by greater external labor market opportunities tend to exert more effort, leading to a reduction in COEC. This is further evidenced by our path analysis showing firm performance as a mediating factor in this relationship. The study also delves into various moderating factors such as CEOs' upward immobility, corporate governance strength, cash richness, and the stage in the product life cycle, enhancing our understanding of the conditions under which this relationship is more pronounced.

We contribute to the existing body of literature in three key areas. Firstly, it extends the understanding of CEO tournament incentives from their effects on corporate behavior and firm value to a fundamental determinant of firm policies: the cost of equity. Secondly, it adds a new

dimension to the determinants of COEC, traditionally focused on firm-specific characteristics, by highlighting the role of CEO personal incentives. Finally, our study bridges the gap between corporate finance, executive compensation, and market perception, providing insights into how internal corporate strategies and market competition influence a firm's financial health and investment appeal.

Our work not only fills a critical gap in existing research but also offers practical implications for corporate governance and financial strategy, emphasizing the need to consider CEO labor market incentives in financial decision-making and policy formulation.

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Table 1. Summary Statistics

This table reports the number of observations, mean, standard deviation, 25th percentile, 50th percentile, and 75th percentile of the variables used in our baseline sample. Definitions of the variables are given in Appendix I.

Variables	N	Mean	Sd.	P25	P50	P75
COECC	18164	6.219	6.260	3.180	5.413	7.822
ITI	18164	9.378	0.993	8.833	9.452	9.964
Beta	18164	1.165	0.618	0.744	1.085	1.483
IVOL	18164	9.883	4.339	6.747	9.011	11.927
MMT	18164	15.509	39.013	-9.440	11.280	33.969
BM	18164	0.435	0.277	0.239	0.374	0.563
Size	18164	7.733	1.499	6.620	7.582	8.710
Leverage	18164	0.215	0.165	0.066	0.208	0.327
FLTG	18164	14.980	7.107	10.535	13.900	18.000
Forecast Dispersion	18164	0.071	0.144	0.014	0.028	0.063
Forecast Bias	18164	0.522	2.551	-0.238	-0.007	0.457
CEO Delta	18164	5.542	1.386	4.622	5.509	6.444
CEO Vega	18164	3.684	1.838	2.755	3.988	4.995
CEO Age	18164	55.551	7.019	51.000	56.000	60.000
Female CEO	18164	0.026	0.160	0.000	0.000	0.000
CEO Tenure	18164	7.352	6.934	2.000	5.000	10.000

Table 2. Industry Tournament Incentives and the Cost of Equity

This table presents the regression results of the relation between the CEO industry tournament incentives (*ITI*) and the cost of equity. The dependent variable is the value of the cost of equity averaged across four different measures (*COEC*). Definitions of the variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
ITI	-0.436***	-0.472***
	(-2.89)	(-3.19)
Beta	0.522***	0.549***
	(3.50)	(3.69)
IVOL	0.112***	0.113***
	(4.35)	(4.29)
MMT	-0.017***	-0.017***
	(-13.28)	(-13.52)
BM	3.059***	2.932***
	(8.15)	(7.59)
Size	-0.114	-0.057
	(-1.56)	(-0.66)
Leverage	4.433***	4.415***
	(7.58)	(7.30)
FLTG	0.010	0.018
	(0.90)	(1.61)
Forecast Dispersion	2.044***	1.977***
	(3.36)	(3.25)
Forecast Bias	0.873***	0.868***
	(12.85)	(12.81)
CEO Delta		-0.109
		(-1.23)
CEO Vega		-0.057
		(-1.04)
CEO Age		0.036***
		(3.21)
Female CEO		1.455
		(1.60)
CEO Tenure		-0.033***
		(-2.74)
Industry-Year Fixed Effects	Yes	Yes
R-sq	0.378	0.382
Observations	18164	18164

Table 3. Robustness Analyses

This table examines the robustness of the results reported in Tables 2 to the alternative measures of industry tournament incentives (*ITI*) and the cost of equity. In Panel A, the dependent variable is *COEC*. Industry tournament incentives (ITIs) is calculated based on the Fama-French 30-industry classification scheme in column (1) and column (2), and the Fama-French 12-industry classification scheme in column (3) and column (4). In panel B, the dependent variable is the cost of equity calculated based on Gebhardt et al. (2001) (*Cost of Equity GLS*), Claus and Thomas (2001) (*Cost of Equity CT*), Easton (2004) (*Cost of Equity MPEG*), and Ohlson and Juettner-Nauroth (2005) (*Cost of Equity OJ*), respectively from column(1) to column (4). Definitions of the variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Alternative Measures of Industry Tournament Incentives

	ITIs Based on FF30 Industry Classification		ITIs Based on FF12 Industry Classification	
	(1)	(2)	(3)	(4)
ITI	-0.550**	-0.582**	-0.699***	-0.706***
	(-2.40)	(-2.56)	(-2.77)	(-2.84)
Beta	0.526***	0.553***	0.533***	0.560***
	(3.53)	(3.72)	(3.58)	(3.76)
IVOL	0.114***	0.115***	0.117***	0.118***
	(4.44)	(4.38)	(4.53)	(4.48)
MMT	-0.017***	-0.017***	-0.017***	-0.017***
	(-13.27)	(-13.50)	(-13.25)	(-13.47)
BM	3.055***	2.931***	3.058***	2.938***
	(8.12)	(7.56)	(8.06)	(7.53)
Size	-0.112	-0.052	-0.089	-0.031
	(-1.45)	(-0.58)	(-1.17)	(-0.34)
Leverage	4.422***	4.408***	4.417***	4.401***
	(7.56)	(7.28)	(7.54)	(7.26)
FLTG	0.011	0.018*	0.011	0.018*
	(0.95)	(1.66)	(0.97)	(1.67)
Forecast Dispersion	2.035***	1.967***	2.068***	2.000***
	(3.34)	(3.24)	(3.40)	(3.30)
Forecast Bias	0.873***	0.868***	0.872***	0.868***
	(12.85)	(12.81)	(12.87)	(12.83)
CEO Delta		-0.109		-0.105
		(-1.23)		(-1.18)
CEO Vega		-0.058		-0.052
		(-1.07)		(-0.97)
CEO Age		0.035***		0.035***
		(3.17)		(3.17)
Female CEO		1.456		1.457
		(1.59)		(1.58)
CEO Tenure		-0.033***		-0.033***
		(-2.70)		(-2.74)
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes
R-sq	0.378	0.382	0.378	0.382
Observations	18159	18159	18156	18156

Panel B. Alternative Measures of the Cost of Equity

	(1) Cost of Equity GLS	(2) Cost of Equity CT	(3) Cost of Equity MPEG	(4) Cost of Equity OJ
ITI	-0.223**	-0.613***	-0.455***	-0.503***
	(-2.38)	(-3.75)	(-2.77)	(-3.58)
Beta	0.313***	0.555***	0.745***	0.485***
	(3.45)	(3.04)	(4.47)	(3.45)
IVOL	0.114***	0.154***	0.127***	0.073***
	(6.79)	(4.75)	(4.26)	(2.91)
MMT	-0.014***	-0.016***	-0.020***	-0.018***
	(-17.06)	(-10.71)	(-13.02)	(-15.00)
BM	5.772***	1.679***	2.366***	2.015***
	(23.36)	(3.65)	(5.49)	(5.84)
Size	-0.107*	-0.049	-0.053	0.034
	(-1.92)	(-0.48)	(-0.56)	(0.41)
Leverage	2.371***	5.517***	4.910***	4.308***
	(6.19)	(7.50)	(7.32)	(8.03)
FLTG	0.003	0.032**	-0.022*	0.063***
	(0.36)	(2.30)	(-1.83)	(6.00)
Forecast Dispersion	-1.547***	-2.790***	9.408***	3.290***
	(-4.79)	(-3.86)	(12.37)	(5.53)
Forecast Bias	0.467***	1.021***	0.949***	0.761***
	(12.29)	(11.72)	(13.17)	(13.48)
CEO Delta	-0.014	-0.114	-0.194**	-0.177**
	(-0.25)	(-1.11)	(-2.01)	(-2.11)
CEO Vega	-0.083**	-0.069	-0.021	-0.013
	(-2.46)	(-1.08)	(-0.35)	(-0.25)
CEO Age	0.025***	0.042***	0.034***	0.034***
	(3.55)	(3.06)	(2.79)	(3.25)
Female CEO	0.870	1.436	1.703*	1.460*
	(1.48)	(1.47)	(1.70)	(1.72)
CEO Tenure	-0.019**	-0.033**	-0.036***	-0.032***
	(-2.45)	(-2.34)	(-2.61)	(-2.71)
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes
R-sq	0.515	0.303	0.408	0.359
Observations	18164	18164	18164	18164

Table 4. Instrumental Variable Approach

This table presents the results of two-stage GMM instrumental variable regressions. The dependent variable is the average value of the cost of equity (*COEC*); Ind CEO Comp and Geo CEO Mean are the instrumental variables for the *ITI*. Columns (1) and (3) present the first-stage regression results, and Columns (2) and (4) show the second-stage regression results. Definitions of the variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) 1st Stage ITI	(2) 2nd Stage Cost of Equity Average	(3) 1st Stage ITI	(4) 2nd Stage Cost of Equity Average
ITI		-0.743***		-0.822***
		(-3.12)		(-3.50)
Ind CEO Comp	-0.215**		-0.219**	
	(-2.54)		(-2.57)	
Higher-Paid Ind CEOs	0.440***		0.443***	
	(47.07)		(45.70)	
Beta	0.014**	0.536***	0.013**	0.564***
	(2.31)	(3.63)	(2.23)	(3.82)
IVOL	-0.002**	0.109***	-0.002**	0.109***
	(-2.19)	(4.26)	(-1.97)	(4.17)
MMT	-0.000	-0.017***	-0.000	-0.017***
	(-0.19)	(-13.29)	(-0.10)	(-13.57)
BM	-0.012	3.039***	-0.017	2.912***
	(-0.92)	(8.15)	(-1.25)	(7.57)
Size	-0.009**	-0.169**	-0.009**	-0.117
	(-2.37)	(-2.32)	(-2.19)	(-1.38)
Leverage	-0.001	4.381***	-0.009	4.361***
	(-0.04)	(7.47)	(-0.42)	(7.21)
FLTG	-0.001	0.010	-0.000	0.018
	(-1.19)	(0.92)	(-0.85)	(1.62)
Forecast Dispersion	0.006	2.074***	0.005	2.015***
	(0.37)	(3.40)	(0.29)	(3.32)
Forecast Bias	-0.000	0.871***	-0.000	0.866***
	(-0.09)	(12.82)	(-0.15)	(12.78)
CEO Delta			-0.004	-0.103
			(-1.37)	(-1.17)
CEO Vega			0.005**	-0.069
			(2.13)	(-1.27)
CEO Age			-0.000	0.035***
			(-0.02)	(3.17)
Female CEO			-0.022	1.439
			(-0.90)	(1.58)
CEO Tenure			-0.001**	-0.033***
			(-1.97)	(-2.73)
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes
R-sq		0.256		0.260
Observations	18164	18164	18164	18164
Endogeneity, relevance, and overidentification				
Hansen J-test	1.177		1.343	
Hausman exogeneity test	3.459*		4.456**	
First-stage F-statistics	1160.203		1089.052	

Table 5. The Effect of CEO Upward Mobility on the Association Between CEO Industry Tournament Incentive and the Cost of Equity

This table presents how the association between CEO industry tournament incentives and the cost of equity varies with the mobility of a CEO. The dependent variable is the average value of the cost of equity (*COEC*. Definitions of all variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
ITI*	0.257**	
Older CEO Dummy	(2.06)	
ITI*		-0.372*
Higher-Paid Ind CEOs		(-1.85)
Older CEO Dummy	-2.205*	
	(-1.90)	
Higher-Paid Ind CEOs		3.358*
		(1.73)
ITI	-0.627***	-0.435***
	(-3.86)	(-2.83)
Beta	0.549***	0.544***
	(3.70)	(3.68)
IVOL	0.110***	0.111***
	(4.19)	(4.23)
MMT	-0.017***	-0.017***
	(-13.48)	(-13.48)
BM	2.979***	2.893***
	(7.73)	(7.51)
Size	-0.044	-0.099
	(-0.51)	(-1.15)
Leverage	4.431***	4.408***
	(7.34)	(7.28)
FLTG	0.016	0.018
	(1.44)	(1.60)
Forecast Dispersion	1.978***	1.993***
	(3.26)	(3.29)
Forecast Bias	0.868***	0.868***
	(12.81)	(12.83)
CEO Delta	-0.116	-0.110
	(-1.31)	(-1.24)
CEO Vega	-0.059	-0.064
	(-1.09)	(-1.19)
CEO Age		0.036***
		(3.24)
Female CEO	1.431	1.442
	(1.57)	(1.58)
CEO Tenure	-0.022**	-0.033***
	(-2.02)	(-2.71)
Industry-Year Fixed Effects	Yes	Yes
R-sq	0.381	0.382
Observations	18164	18164

Table 6. The Effect of Corporate Governance on the Association Between CEO Industry Tournament Incentive and the Cost of Equity

This table presents how the association between CEO industry tournament incentives and the cost of equity varies with corporate governance of a firm. The dependent variable is the average value of the cost of equity (*COEC*). Definitions of all variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
ITI*	-0.388*	
Low Competition Dummy	(-1.67)	
ITI*		-0.351*
Low Hostile-Takeover Index Dummy		(-1.96)
Low Competition Dummy	3.719	
	(1.61)	
Low Hostile-Takeover Index Dummy		3.080*
		(1.88)
ITI	-0.246	-0.348*
	(-1.26)	(-1.83)
Beta	0.548***	0.529***
	(3.68)	(3.43)
IVOL	0.114***	0.097***
	(4.31)	(3.39)
MMT	-0.017***	-0.015***
	(-13.49)	(-10.77)
BM	2.941***	2.541***
	(7.61)	(5.86)
Size	-0.054	-0.130
	(-0.62)	(-1.21)
Leverage	4.393***	4.711***
	(7.30)	(6.32)
FLTG	0.018	0.005
	(1.62)	(0.40)
Forecast Dispersion	1.973***	1.927***
	(3.24)	(2.81)
Forecast Bias	0.868***	0.923***
	(12.81)	(12.24)
CEO Delta	-0.108	-0.052
	(-1.22)	(-0.50)
CEO Vega	-0.055	-0.085
	(-1.02)	(-1.11)
CEO Age	0.036***	0.031**
	(3.24)	(2.42)
Female CEO	1.432	1.939
	(1.58)	(1.64)
CEO Tenure	-0.033***	-0.039***
	(-2.74)	(-2.80)
Industry-Year Fixed Effects	Yes	Yes
R-sq	0.382	0.376
Observations	18164	14478

Table 7. The Effect of Cash Holdings on the Association Between CEO Industry Tournament Incentive and the Cost of Equity

This table presents how the association between CEO industry tournament incentives and the cost of equity varies with cash holdings of a firm. The dependent variable is the average value of the cost of equity (*COEC*). Definitions of all variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
ITI*	-0.258*	
High Cash-Holdings Dummy	(-1.81)	
ITI*		-0.244**
High Industry-Adjusted-Cash-Holdings Dummy		(-1.98)
High Cash-Holdings Dummy	2.677**	
	(2.03)	
High Industry-Adjusted-Cash-Holdings Dummy		2.327**
		(2.01)
ITI	-0.361**	-0.352**
	(-2.21)	(-2.30)
Beta	0.542***	0.554***
	(3.68)	(3.75)
IVOL	0.111***	0.114***
	(4.22)	(4.31)
MMT	-0.017***	-0.017***
	(-13.53)	(-13.52)
BM	2.980***	2.929***
	(7.61)	(7.44)
Size	-0.061	-0.055
	(-0.70)	(-0.63)
Leverage	4.614***	4.414***
	(7.78)	(7.44)
FLTG	0.018	0.018*
	(1.64)	(1.65)
Forecast Dispersion	1.951***	1.980***
	(3.20)	(3.24)
Forecast Bias	0.868***	0.868***
	(12.84)	(12.83)
CEO Delta	-0.105	-0.108
	(-1.19)	(-1.22)
CEO Vega	-0.056	-0.057
	(-1.03)	(-1.05)
CEO Age	0.036***	0.035***
	(3.22)	(3.18)
Female CEO	1.423	1.450
	(1.56)	(1.59)
CEO Tenure	-0.033***	-0.033***
	(-2.76)	(-2.72)
Industry-Year Fixed Effects	Yes	Yes
R-sq	0.382	0.382
Observations	18162	18162

Table 8. The Effect of Product Life Cycles on the Association Between CEO Industry Tournament Incentive and the Cost of Equity

This table presents how the association between CEO industry tournament incentives and the cost of equity varies with product life cycles of a firm. The dependent variable is the average value of the cost of equity (*COEC*). Definitions of all variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
ITI*Life-Cycle 1	-0.482***	-0.489***
	(-3.01)	(-3.14)
ITI* Life-Cycle 2	-0.418**	-0.454***
	(-2.48)	(-2.73)
ITI* Life-Cycle 3	-0.441***	-0.482***
	(-2.88)	(-3.19)
ITI* Life-Cycle 4	-0.185	-0.247
	(-0.93)	(-1.26)
Beta	0.506***	0.533***
	(3.15)	(3.31)
IVOL	0.095***	0.095***
	(3.71)	(3.61)
MMT	-0.018***	-0.018***
	(-13.84)	(-14.10)
BM	3.295***	3.163***
	(8.77)	(8.17)
Size	-0.100	-0.030
	(-1.33)	(-0.35)
Leverage	4.208***	4.218***
	(7.69)	(7.40)
FLTG	0.020*	0.027**
	(1.77)	(2.49)
Forecast Dispersion	2.346***	2.253***
	(3.50)	(3.38)
Forecast Bias	0.875***	0.871***
	(12.15)	(12.10)
CEO Delta		-0.135
		(-1.57)
CEO Vega		-0.055
		(-1.02)
CEO Age		0.041***
		(3.43)
Female CEO		1.517
		(1.60)
CEO Tenure		-0.032***
		(-2.60)
Industry-Year Fixed Effects	Yes	Yes
R-sq	0.381	0.386
Observations	15506	15506

Table 9. Path Analysis

This table reports the results of path analyses that examine the relation between CEO industry tournament incentives and the cost of equity through firm performance. We estimate a generalized structural equation model (GSEM) of the direct effect of CEO industry tournament incentives on the cost of equity, as well as the indirect effect through firm performance. Firm performance is measured using Tobin's q in Panel A and ROA in Panel B. The significance of the indirect effect is estimated using the Sobel (1982) test statistics. Definitions of all variables are given in Appendix I. The standard errors are clustered at the firm level; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Mediated Path for Tobin's q

	COECfficient	z-statistics
Direct Path		
P(COEC, ITI)	-0.391	-2.71***
Mediated Path for Tobin's		
P(COEC: Tobins'q)	-0.813	-12.62***
P(Tobin: ITI)	0.256	9.90***
P(COEC: Tobins'q)*P(Tobins'q: ITI)	-0.209	-7.85***
Controls	Yes	
Observations	18273	

Panel B. Mediated Path for ROA

	COECfficient	z-statistics
Direct Path		
P(COEC, ITI)	-0.459	-3.25***
Mediated Path for ROA		
P(COEC: ROA)	-3.495	-3.25***
P(ROA: ITI)	0.004	3.08***
P(COEC: ROA)*P(ROA: ITI)	-0.013	-2.19**
Controls	Yes	
Observations	18273	

Appendix I. Variable Definitions

Variable Name	Definition	Data Source
COEC	The average implied cost of equity capital in excess of the risk-free rate in percentage. COEC = (Cost of Equity GLS + Cost of Equity CT + Cost of Equity MPEG + Cost of Equity OJ) / 4. The risk-free rate is measured by the yield of a 10-year US Treasury bond.	I/B/E/S, CRSP, Compustat, and Federal Reserve Economic Data (FRED)
Cost of Equity GLS	The implied cost of equity capital in excess of the risk-free rate as a percentage, calculated following Gebhardt et al. (2001), at the end of June of each year. The risk-free rate is measured by the yield of a 10-year US Treasury bond.	I/B/E/S, CRSP, Compustat, and FRED
Cost of Equity CT	The implied cost of equity capital in excess of the risk-free rate as a percentage, calculated following Gebhardt et al. (2001), at the end of June of each year. The risk-free rate is measured by the yield of a 10-year US Treasury bond.	I/B/E/S, CRSP, Compustat, and FRED
Cost of Equity MPEG	The implied cost of equity capital in excess of the risk-free rate as a percentage, calculated using the modified price-earnings growth ratio model in Easton (2004), at the end of June of each year. The risk-free rate is measured by the yield of a 10-year US Treasury bond.	I/B/E/S, CRSP, Compustat, and FRED
Cost of Equity OJ	The implied cost of equity capital in excess of the risk-free rate as a percentage, calculated following Ohlson and Juettner-Nauroth (2005) and Gode and Mohanram (2003), at the end of June of each year. The risk-free rate is measured by the yield of a 10-year US Treasury bond.	I/B/E/S, CRSP, Compustat, and FRED
ITI	The difference between the second-highest chief executive officer (CEO) total compensation in the industry and the CEO's total compensation. Unless otherwise specified, industries are defined based on the Fama-French 48-industry classification scheme.	ExecuComp
Beta	Estimated for each firm-year observation at the end of June by regressing monthly stock returns on the value-weighted market returns. Monthly returns in the 60 months before the month in which we compute the cost of equity are used in the regression (with a minimum of 24 return observations).	Center for Research in Security Prices (CRSP)
IVOL	The standard deviation of the residuals from regressing monthly stock returns as a percentage on the value-weighted market returns as a percentage. Monthly returns in the 60 months before the month in which we compute the cost of equity are used in the regression (with a minimum of 24 return observations).	CRSP
MMT	Momentum measured by the stock return over the 12 months before the month in which we compute the cost of equity.	CRSP
BM	The ratio of the book value of equity to the market value of equity measured at the fiscal year end.	Compustat
Size	The logarithm of a firm's market value of equity measured at the fiscal year end.	Compustat
Leverage	The sum of long-term debt and debt in current liabilities scaled by the value of total assets measured at the fiscal year end.	Compustat
FLTG	The long-term earnings growth rate forecast as a percentage.	I/B/E/S
Forecast Dispersion	The standard deviation of the one-year-ahead earning per share (EPS) analyst forecasts divided by the average one-year-ahead EPS forecast.	I/B/E/S

Forecast Bias	The difference between the one-year-ahead forecasted EPS and actual EPS, scaled by share price. When the actual EPS is missing from I/B/E/S, the actual EPS from Compustat is used.	I/B/E/S and Compustat
CEO Delta	The logarithm of a CEO's total portfolio delta, computed as the CEO's dollar increase in wealth for a 1% increase in stock price.	ExecuComp
CEO Vega	The logarithm of a CEO's total portfolio vega, computed as the the CEO's increase in option wealth for a 0.01-standard-deviation increase in stock volatility.	ExecuComp
CEO Age	The CEO's age in the sample year	ExecuComp
Female CEO	Dummy variable, set to one for a female CEO, and zero otherwise.	ExecuComp
CEO Tenure	The number of years as the firm's CEO	ExecuComp
Ind CEO Comp	The sum of total compensation of all other CEOs in each industry, except the highest-paid CEO	ExecuComp
Older CEO Dummy	A binary variable that equals one if a CEO's age is higher or equal to the sample median.	ExecuComp
Higher-Paid Ind CEOs	The natural logarithm of the total number of CEOs with higher total compensation within the same industry.	ExecuComp
High Higher-Paid Ind CEOs	A binary variable that equals one if the total number of CEOs with higher total compensation within the same industry is higher or equal to the sample median.	ExecuComp
Low Competition Dummy	A binary variable that equals one if a firm's sales-based Herfindahl–Hirschman Index is higher or equal to the sample median.	Compustat
Low Hostile Takeover Index Dummy	A binary variable that equals one if a firm's hostile takeover index (see Cain et al., 2017) is lower or equal to the sample median.	Prof. Stephen McKeon's website, https://pages.uoregon.edu/smckeon/.
High Cash-Holdings Dummy	A binary variable that equals one if a firm's cash holdings ratio is higher or equal to the sample median.	Compustat
High Industry-Adjusted-Cash-Holdings Dummy	A binary variable that equals one if a firm's industry-adjusted cash-holdings ratio is higher or equal to the sample median. A firm's industry-adjusted cash-holdings ratio is its cash holdings ratio minus the average of this ratio for the corresponding industry in a year.	Compustat
Tobin's q	Tobin's q, calculated as total assets minus the book value of equity plus the market value of equity, scaled by total assets	Compustat
ROA	Return on asset, calculated as net income divided by book value of total asset.	Compustat
Life-Cycle 1	A measure of product life cycles as defined in Hoberg and Maksimovic (2023). It measures the intensity of product innovation of a company based on 10-K text-based model of product life cycles.	Hoberg-Maksimovic Product Life Cycles Data Repository
Life-Cycle 2	A measure of product life cycles as defined in Hoberg and Maksimovic (2023). It measures the intensity of process innovation a company based on 10-K text-based model of product life cycles.	Hoberg-Maksimovic Product Life Cycles Data Repository
Life-Cycle 3	A measure of product life cycles as defined in Hoberg and Maksimovic (2023). It measures the intensity of stable and mature products a company based on 10-K text-based model of product life cycles.	Hoberg-Maksimovic Product Life Cycles Data Repository
Life-Cycle 4	A measure of product life cycles as defined in Hoberg and Maksimovic (2023). It measures the intensity of product decline (discontinuation) a company based on 10-K text-based model of product life cycles.	Hoberg-Maksimovic Product Life Cycles Data Repository