The Cost of Capital and Corporate Employment

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Abstract

We examine how corporate employment responds to the time-varying cost of capital (COC) in the presence of labor adjustment costs and financial constraints. We find that the firm-level COC negatively affects corporate employment. The effect is stronger for firms with lower labor adjustment costs and financial constraints. We provide causal evidence for these observed impacts by exploiting several quasi-experiments that cause shocks to the COC or labor adjustment costs. Our findings suggest that financial and labor market frictions play critical roles in corporate employment decisions.

JEL Classification: E24, G32, J63

Keywords: cost of capital; corporate employment; labor adjustment cost

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1 Introduction

While much research has explored the impact of the cost of capital (COC) on corporate investment, comparatively little is known about the effect of the COC on corporate employment. The traditional economic models typically assume labor is a flexible input in production, which can be funded from cash flows generated from production (Dixit and Pindyck, 1994; Keen, 2004). However, Oi (1962) suggests that labor is a quasi-fixed factor of production requiring upfront and ongoing costs. When firms incur such labor-related costs before realizing cash flows from labor, external capital becomes crucial for financing employment.[1] Consequently, the COC should directly affect corporate employment. No empirical studies have explored whether and how corporate employment is affected by the time-varying COC. Even less is known about how the relation between corporate employment and financing costs is shaped by labor market frictions that impose adjustment costs of employment and financial market imperfections that constrain firms' access to finance. To shed lights on these issues, we investigate the impact of the COC on corporate employment for firms facing labor adjustment costs and financial constraints, which is particularly relevant to economic policies aiming at promoting employment in the economy.

In a standard q-theory model, the COC has a negative effect on investment (Abel and Blanchard, 1986). Peters and Taylor (2017) show that the classical q-theory derived from physical investment can be extended to human capital investment. Like physical capital, human capital is costly to obtain and helps generate future profits. However, employment differs from physical investment because it takes time for firms to train their employees and firms cannot freely dismiss their workers due to protective labor laws and policies. Various labor

[1] See, among others, Chodorow-Reich (2014), Duygan-Bump, Levkov, and J. (2015), Agrawal and Matsa (2013), Michaels, Page, and Whited (2019) and Benmelech, Bergman, and Seru (2021)

market frictions imply that labor adjustment imposes additional hiring, training, and firing costs (Oi, 1962). These adjustment costs slow firms' labor adjustment in response to shocks (Bernanke, 1983; Abel et al., 1996; Abel and Eberly, 1996). Moreover, firms' abilities to adjust employment to the COC are also affected by financial market frictions (Benmelech, Frydmana, and Papanikolaou, 2019). Financially unconstrained firms with easy access to external capital should be better able to finance their employment with external funds when the COC is low. Accordingly, we develop hypotheses that corporate employment is negatively related to the COC and that firms with lower labor adjustment costs and less financial constraints are more responsive to fluctuations in the COC in their employment adjustments.

To test these hypotheses, we estimate the COC by the weighted average cost of capital for a sample of U.S. firms from 1976 to 2020. We measure the cost of equity (COE) by using several approaches: the Fama and French (1993) 3-factor (FF3), the Carhart (1997) 4-factor (FF4), and the Fama and French (2015) five-factor plus the momentum factor (FF6) models, and the implied cost of capital (ICC). The ICC is obtained by equating the stock price to the present value of expected future cash flow forecasts by analysts. The cost of debt (COD) is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). We find that the COC has a negative effect on the change in corporate employment. In particular, a standard deviation increase in the COC is associated with approximately 7% lower employment.

We further examine how the sensitivity of employment to the time-varying COC is influenced by labor market frictions. The literature has shown that firms have higher labor adjustment costs when their workers are unionized (Chen, Kacperczyk, and Ortiz-Molina, 2011), require firm-specific training and high skills (Schmalz, 2015; Belo et al., 2017), and have more firm-specific assets and innovation (Becker, 1962), while labor-intensive firms face lower adjustment costs (Chakrabarti, 2009). Using these proxies for labor adjustment costs, we find that the negative effect of the COC on corporate employment is more pronounced for firms with greater labor intensity, firms without labor unions, firms with low-skilled workers, firms with fewer employee development programs, firms with fewer firm-specific assets, and firms with lower innovation intensity. These findings indicate that the employment of firms with lower labor adjustment costs is more responsive to the COC. Interestingly, we also observe that the sensitivity of corporate employment to cash flows is more pronounced for firms with lower labor adjustment costs. These findings suggest that labor adjustment costs affect the sensitivity of corporate employment to cash flows as well as to the COC.

The impact of the COC on corporate employment may suffer from the endogeneity concern that the observed relationship might be driven by some unobserved factors influencing both employment and the COC or that corporate employment might affect the COC. To address this concern, we exploit two quasi-experiments that cause shocks to firms' financing costs and examine the cross-sectional heterogeneity in changes of employment around the shocks. This difference-in-differences (DID) approach helps isolate the causal effects of the COC on corporate employment from other potential confounding factors. The first quasi-experiment is Regulation Fair Disclosure (Reg FD) implemented in 2000 that prohibits selective disclosure of information by publicly traded companies. Chen, Dhaliwal, and Xie (2010) show that Reg FD reduces the COC through greater transparency for firms more prone to selective disclosure before the regulation. Using Reg FD as a shock to firms' COC, we find that changes in corporate employment are larger for firms experiencing greater declines in the COC following Reg FD than firms with smaller declines in the COC. Furthermore, such effects are more pronounced for firms with lower employment adjustment costs.

In the second quasi-experiment, we utilize unexpected changes in monetary policy as shocks to the COC. Bernanke and Kuttner (2005), Gertler and Karadi (2015), and Hanson and

Stein (2015) suggest that monetary policy surprises affect the COC by influencing equity and term premia as well as credit spreads. Since the changes in the COC due to unexpected monetary shocks are presumably unrelated to firm-specific product demand, the ensuing changes in corporate employment should reflect the causal impacts of the COC on corporate employment. Our results show that monetary policy surprises have significantly negative impacts on employment for firms with greater monetary policy exposures and lower employment adjustment costs. These results are consistent with our hypotheses that the COC has negative effects on corporate employment and that the negative effects are pronounced at firms with lower employment adjustment costs.

To provide further evidence that adjustment costs play an important role in the sensitivity of corporate employment to the COC, we exploit the staggered adoption of the Inevitable Disclosure Doctrine (IDD) across U.S. states as shocks to employment adjustment costs. One of the key factors in employment adjustment is the cost of losing workers to competitors. Firms may hoard their employees lest they lose their employees with trade secrets to their competitors. Trade secrets are an important risk source because the divulgence of such secrets cause the firm significant economic harm (Klasa et al., 2018). The IDD laws effectively reduce labor adjustment costs by reducing such risk. Using the recognition of the IDD as a shock to labor adjustment costs, we find an increased sensitivity of corporate employment to the COC for firms located in the states adopting the IDD laws. This result confirms the importance of adjustment costs for corporate employment responding to the COC.

When firms adjust their employment to the COC, financial market constraints should also be in play: firms with easy access to external capital are potentially more capable of adjusting their employment in response to the COC. Consistent with this hypothesis, we find that the employment of financially unconstrained firms with low adjustment costs is more sensitive to the COC. In contrast, the employment of financially constrained firms with low adjustment costs is more sensitive to internal cash flows. Thus, our findings suggest that both labor market and financial market frictions impose significant barriers to corporate employment adjustment. Firms with better access to external capital and low adjustment costs are more likely to adjust their employment in response to variations in the COC. In contrast, firms with limited access to external finance and low adjustment costs are likely to adjust their employment to internal cash flows.

We also conduct various robustness checks to ensure the validity of our results. Our conclusions remain consistent when we apply the measurement-error robust generalized method of moments (GMM) technique, alternative employment growth measures, alternative COC measures, alternative model specifications, and alternative sample periods.

Our paper is related to the literature on the COC-investment link. To the best of our knowledge, our study is the first to examine the effect of the COC on corporate employment. Previous studies find empirically puzzling results on the effect of the COC on physical investment. In particular, the effect is positive when the cost of equity is estimated by the factor models, whereas the effect is negative when the cost of equity is estimated by the ICC (Frank and Shen, 2016; Byoun and Wu, 2019). Interestingly, we find that COC proxies estimated by both approaches have consistent negative effects on corporate employment.

The theoretical literature on investment emphasizes the importance of capital adjustment costs in firms' investment decisions. However, to a great extent, the impacts of adjustment costs on corporate investment have not been explicitly addressed in the empirical literature. The result contrasts with the extensive literature on the effects of financial constraints on investment. This gap probably exists due to the difficulty of assessing adjustment costs of physical capital at the firm level (Groth and Khan, 2010). We extend empirical work to examine how adjustment costs stemming from labor market frictions interfere with corporate employment responding to the COC.

We also contribute to the literature on the q-theory of investment. According to q-theory, marginal q should be a sufficient statistic that explains corporate investment. However, empirical studies show that firms' investments exhibit sensitivity to cash flows even after q is controlled for (Fazzari, Hubbard, and Petersen, 1998; Baker, Stein, and Wurgler, 2003). This literature has focused mainly on physical investment and paid little attention to corporate employment. Peters and Taylor (2017) suggest that a new q that accounts for intangible capital better explains intangible investment opportunities. Adding to this literature, our results show that firms' employment adjustment is sensitive not only to cash flows but also to the COC even in the presence of q, particularly when firms face low adjustment costs. Financially unconstrained firms with lower adjustment costs respond more to COC fluctuations and adjust their employment relatively easily. In contrast, financially constrained firms with lower adjustment costs respond more to fluctuations in internal cash flows. Our new findings on the employment-COC relation provide direct evidence on the real effect of financial constraints.

Our study is also related to studies on labor and finance. Ghaly, Dang, and Stathopoulos (2017) and Klasa, Maxwell, and Ortiz-Molina (2009) suggest that labor market frictions have impacts on corporate cash holdings, while Bae, Kang, and Wang (2011), Agrawal and Matsa (2013), and Serfling (2016) show that labor market frictions affect corporate financial leverage. Giroud and Mueller (2017, 2021) and Caggese, Cuñat, and Metzger (2019) suggest that financial constraints impair firms' ability to engage in labor hoarding and distort the allocation of employees. None of these studies, however, consider the employment adjustment costs which are the key driver of "labor hoarding" (Oi, 1962; Sharpe, 1994). We add to the literature by showing that employment adjustment costs also directly affect corporate employment decisions when firms respond to the COC. Our results suggest that financially constrained firms, relative to unconstrained firms, are less likely to increase employment in response to a lower COC. This finding suggests that an economic policy that reduces the COC to increase firm-level employment is less effective for financially constrained firms.

2 Hypothesis Development

A central normative proposition in the textbook discussion of capital budgeting is that firms should increase investment if the investment return exceeds the COC. Likewise, theories make a clear prediction about the impact of the COC on investment. For example, Fischer and Merton (1984) argue that when the market is ready to accept a lower rate of return, a firm should increase investment spending until the marginal COC equals the marginal return on investment. Q-theory also predicts a negative effect of the COC on investment (Abel and Blanchard, 1986). These models conveniently assume that firms costlessly adjust employment to variations in product demand. Therefore, it is perhaps not surprising that there is little discussion on how firms should make their employment decisions concerning the COC. Human capital, however, like physical capital, is costly to obtain and produces future profits. Thus, these theories can be applied to human capital investment (Peters and Taylor, 2017).

Since firms incur upfront search and training costs before realizing cash flows from human capital, this possible mismatch in the timing of cash inflows and outflows incurs fixed employment costs (Oi, 1962). Firms may need to finance part of their labor costs with external capital (Acabbi, Panetti, and Sforza, 2020). Consequently, the COC can be critical for corporate employment decisions. A rising COC increases the marginal costs of hiring, leading to employment reductions. Accordingly, the effect of the COC on corporate employment is expected to be negative, similar to that on capital investment:

Hypothesis 1: The COC has a negative effect on employment.

Corporate employment, however, differs from physical investment in that any skills acquired by corporate employment become a part of the employee. While it takes time and money for firms to train their employees, trained workers can move to different organizations at will. In addition, firms cannot freely dismiss their workers due to protective labor laws and policies. Moreover, there are additional costs of dismissing workers with trade secrets because they may reveal such secrets when hired by competitors. Various labor market frictions imply that labor adjustment imposes additional costs of hiring, training, and firing (Oi, 1962). The presence of such labor market frictions causes changes in labor force to dampen relative to fluctuations in demand, known as "labor-hoarding" (Sharpe, 1994). Peters and Taylor (2017) show that adjustment costs of intangible assets consisting mainly of human capital are higher than those of physical assets. Since labor adjustment costs may prevent firms from quickly adjusting employment in response to shocks (Bernanke, 1983; Abel et al., 1996; Abel and Eberly, 1996), we hypothesize the following:

Hypothesis 2: Employment is more sensitive to the COC for firms with low labor adjustment costs than for firms with high adjustment costs.

While the employment adjustment costs are the key driver of labor hoarding, financial market frictions impose constraints on firms' access to external capital due to asymmetric information and agency problems in the capital markets (Myers, 1984). While financially unconstrained firms facing low employment adjustment costs can increase employment with external capital when the COC is low, financially constrained firms are less likely to adjust their employment in response to the COC even with low employment adjustment costs due to the additional costs of external capital. Instead, financially constrained firms may rely more on internal cash flows to make employment adjustments, as is the case for capital investment (Fazzari, Hubbard, and Petersen, 1998; Baker, Stein, and Wurgler, 2003). Thus, we hypothesize the following:

Hypothesis 3: Conditional on low employment adjustment costs, financially unconstrained firms' employment is more sensitive to the COC, whereas financially constrained firms' employment is more sensitive to internal cash flows.

3 Data and Methodology

3.1 Sample and Data Source

We obtain analysts' earnings and long-term growth forecasts from I/B/E/S, stock returns from the Center for Research in Security Prices (CRSP), firm-level financial information from Compustat, and macroeconomic indicators from the Bureau of Economic Analysis. Firms' labor policies such as labor union and career development programs are from the MSCI KLD STATS database. Our initial sample consists of U.S. firms in the CRSP/Compustat Merged Database from 1976 to 2020. Following prior research, we exclude firms operating in the utilities (SIC codes 4000-4999) and finance industries (SIC codes 6000-6999). We also exclude observations with missing or negative sales and assets, and with missing information needed to compute the COC. Following convention, we winsorize all variables except for the dummy variables at 1% and 99% to mitigate the effects of outliers. Our final sample consists of 65,765 firm-year observations.

3.2 Variable Construction

We estimate the cost of equity (COE) by the capital asset pricing model (CAPM), the Fama and French (1992, 1993) 3-factor model (FF3), the Carhart (1997) 4-factor model (FF4), the

Fama and French (2015) 6-factor model (FF6) and the implied cost of capital.[2] The factor-model-based expected returns are estimated for each firm at the end of each month as follows:

$$\hat{E}_t\left[r_{i,t+1}\right] = r_{f,t+1} + \sum_{j=1}^{J} \hat{\beta}_i \hat{E}_t\left[f_{j,t}\right] \tag{1}$$

where $\hat{E}_t\left[r_{i,t+1}\right]$ is the expected return for month $t+1$, $r_{f,t+1}$ is the risk-free rate for $t+1$, $\hat{\beta}_i$ is the factor loading, $\hat{E}_t\left[f_{j,t}\right]$ is the expected factor premiums in month t, and J is the number of factors. The factor loadings are estimated through time-series regression using the past five years of monthly stock returns. Consistent with Frank and Shen (2016) and Byoun and Wu (2019), we calculate the expected factor premiums using the means of factor premiums over the full sample period up to the forecast date. We obtain the monthly factor premiums for MKT, SMB, HML, RMW, CMA, and UMD from Ken French's data library. Finally, the monthly expected returns are compounded into an annual return for a given fiscal year.

Since there is no consensus about the best approach to estimating the ICC in the literature, we compute the ICC in three different ways, following the procedures utilized by Li, Ng, and Swaminathan (2013)(ICC^{LNS}), Easton (2004) (ICC^{EAS}), and Gebhardt, Lee, and Swaminathan (2001) (ICC^{GLS}). We provide the detailed estimation procedures in Appendix B.

For a given COE proxy, we estimate the COC as follows:

$$COC_{i,t} = \frac{Debt_{i,t}}{MVA_{i,t}} COD_{i,t}(1 - TaxRate) + (1 - \frac{Debt_{i,t}}{MVA_{i,t}})COE_{i,t}, \tag{2}$$

where $COC_{i,t}$ is the weighted average cost of capital for firm i in year t. $\frac{Debt_{it}}{MVA_{it}}$ is the market leverage ratio. $COD_{i,t}$ is the cost of debt for firm i in year t, measured as the actual yield on the debt carried by the firm, as in Frank and Shen (2016).

We measure the change in corporate employment in several different ways following the

[2] The results based on the CAPM estimate are similar to those based on the factor model estimates and are not reported

literature. For the main results, we define the annual corporate employment change as the change in the number of employees scaled by lagged property, plant, and equipment (PPE), $Hinv_t = \frac{\Delta Emp_t}{PPE_{t-1}}$, as in Ersahin and Irani (2020). This measure represents the change in the number of employees for every one thousand dollars invested in fixed assets. We focus on this measure because it is less prone to extreme values and controls the complementary effects of physical investment on employment. In Section 5.2, we check the robustness of our results under alternative employment growth measures.

3.3 Summary Statistics

Panel A of Table 1 presents the summary statistics of the variables used. The mean value of (*Hinv*) is 4.352, indicating that the annual change in employment is approximately four for every one thousand dollars of investment in fixed assets, representing an average annual employment growth rate (*Empg*) of 6.3%. The average COC ranges from 9.5% to 12.7%, depending on the estimation methods. The average cash flow is 14% of total assets, and Tobin's q (Tobinq) is 1.162. The mean capital expenditure to fixed assets ratio (Capx) is 24.9%. The average leverage ratio (Lev) is 21.9%, and the logarithm of firm age (Age) is approximately 2.76. Firms also have an average cash ratio (Cash) of 13.5% and a tangibility level (FA) of 28.5% relative to total assets.

The unreported Pearson correlation matrix shows that *COC* has a significant and negative correlation with the corporate employment measure *Hinv*, suggesting that firms with high COC tend to exhibit lower corporate employment. The correlations among the control variables are modest, with absolute values of correlation coefficients generally below 0.4.

(Insert Table 1 about here)

4 Empirical Results

4.1 Cost of Capital and Corporate Employment

To investigate the effect of the COC on corporate employment, we estimate the following regression model:

$$Y_{it+1} = \alpha_0 + \alpha_1 COC_{it} + \beta X_{it} + \theta_i + \eta_{jt} + \varepsilon_{it}, \tag{3}$$

where subscripts i and t index the firm and year, respectively. The dependent variable Y is the annual change in corporate employment. The primary explanatory variable is COC. X is a vector of control variables. θ_i and η_{jt} denote firm and 2-digit SIC industry-year fixed effects, respectively. Including η_{jt} controls the effect of time-varying industry shocks.

For the control variables, we include the following variables based on Fazzari, Hubbard, and Petersen (1998) and Baker, Stein, and Wurgler (2003). Cash flow (CF) is calculated as operating income before depreciation divided by total assets. Firms' corporate employment is expected to be positively associated with CF. Tobin's q (*Tobinq*) is included to control for differences in firms' investment opportunities. All else equal, a firm having better investment opportunities should increase employment. The leverage ratio (*Lev*) is included to control for the effect of firm leverage on employment (Giroud and Mueller (2017)). We also include the natural logarithm of a firm's total assets (*Size*) and the logarithm of firm age (*Age*). Additionally, we include firms' cash dividend (*Div*), cash and equivalents (*Cash*), and asset tangibility (*FA*), all scaled by total assets. Capital expenditure (*Capx*) scaled by property, plants, and equipment controls for the effects of the labor-capital complementarities in the production process. We report robust t-statistics based on standard errors clustered at the firm level.

Columns (1)–(3) in Table 2 present the estimation results based on the cost of equity estimated by the three ICC measures (COC^{LNS}, COC^{GLS}, and COC^{EAS}), and Columns (4)–

(6) present the results based on the cost of equity estimated by the factor models (COC^{FF3}, COC^{FF4}, and COC^{FF6}). All coefficient estimates of the COC are negative and significant, indicating that firms decrease corporate employment in response to a higher COC. A one standard deviation increase in COC^{LNS} (0.059) is associated with a decline in employment by 0.3 (=0.059×4.976), which is approximately 7% of the average change in employment ($Hinv$). The results are consistent with the prediction of Hypothesis 1 that the COC has a negative effect on corporate employment.

(Insert Table 2 about here)

The coefficient estimates of *CF* are all positive and significant at the 1% level across all models. These results indicate that low (high) cash flows are associated with less (more) employment. Corporate employment is also positively associated with Tobin's q and the cash ratio but negatively associated with firm size, leverage, and tangibility. The coefficient estimates of the control variables are mostly significant except for those of physical investment (*Capx*), firm age, and sales growth. Collectively, the results in Table 2 provide evidence that the COC has a negative association with corporate employment, while cash flow has a positive relationship. The results are robust to a battery of robustness checks, as shown in Section 5.

4.2 Labor Adjustment Costs

In the presence of labor market frictions, firms face adjustment costs when changing their labor force. To understand how labor adjustment costs affect the responsiveness of corporate employment to the COC, we investigate differences between firms with lower adjustment costs and those with higher adjustment costs. Following the prior literature, we capture labor adjustment costs by labor intensity, union relations, labor skills, human capital development, asset specificity, and innovation intensity.

4.2.1 Labor Intensity and Union Relations

Chakrabarti (2009) shows that labor-intensive firms use labor as the main production factor because they have relatively lower labor costs and can adjust their labor with lower costs. When workers are strongly unionized, firms face higher labor adjustment costs because unionization makes it more difficult to terminate employment (Chen, Kacperczyk, and Ortiz-Molina, 2011). Using labor intensity and union relations as proxies for adjustment costs, we test whether the effects of the COC on corporate employment are more pronounced for labor-intensive firms and firms with weak union relations than capital-intensive firms and firms with strong union relations. We define firms with low labor intensity as those with a below-median employment-to-PPE ratio and firms with high labor intensity as those with an above-median employment-to-PPE ratio. For unions, we obtain information from the MSCI KLD STATS database. Firms are classified as having strong labor unions if they are reported to have high strength in union relations (item EMP-STR-A) and weak labor unions if they are reported to have concerns over union relations (item EMP-CON-A).

The results for firms with low labor intensity are reported in Columns (1) and (2) of Panel A in Table 3. For brevity, we do not report the coefficient estimates of control variables. The coefficient estimates of COC^{LNS} and COC^{FF6} are not significant, which indicates that the COC has no significant association with the corporate employment of firms with low labor intensity. In contrast, for firms with high labor intensity in Columns (3) and (4), the coefficient estimates of COC^{LNS} and COC^{FF6} are negative and significant, suggesting that these firms invest less in employment when facing a higher COC. These results demonstrate that corporate employment is particularly sensitive to changes in the COC among firms with lower labor adjustment costs. Interestingly, the coefficient estimates of cash flow (CF) are also significant for firms with high labor intensity in Columns (3) and (4), while they are insignificant for firms with low labor intensity in Columns (1) and (2). The results suggest that corporate employment shows greater sensitivity to COC and CF for firms with high labor intensity than firms with low labor intensity.

When union relations are utilized to capture labor adjustment costs, we observe a significant sensitivity of corporate employment to the COC and CF only for firms with weak unions in Columns (5) and (6). The coefficients of COC^{LNS}, COC^{FF6}, and CF are insignificant for firms with strong unions, as shown in Columns (7) and (8). The results indicate that firms with weaker unions can better adjust their corporate employment in response to COC and CF fluctuations than firms with stronger unions. These results are consistent with the prediction of Hypothesis 2 that employment of firms with lower adjustment costs is more sensitive to variations in the COC.

(Insert Table 3 about here)

4.2.2 Labor Skills and Human Capital Development Programs

We further test the role of labor adjustment costs in the relationship between the COC and corporate employment by using labor skills and development programs as proxies for labor adjustment costs. Schmalz (2015) and Belo et al. (2017) suggest that firms with highly skilled labor forces face higher adjustment costs than those with low-skilled labor forces. Firms that need high-skilled workers usually implement costly human capital development programs and incentives to train and retain their employees.

We obtain information on human capital skills and development programs from the MSCI KLD STATS database. We capture labor skills by the human capital development indicator (EMP-STR-L), which assesses a company's ability to attract, retain, and develop human capital for a highly-skilled or highly-trained workforce based on its principal lines of business. Since this indicator covers only firms that rely on a highly-skilled or highly-trained workforce, we define firms with a high-skilled (low-skilled) labor force as those with a nonmissing (missing) value of MP-STR-L. For general human capital development, we assign one for firms with any of the following employment enhancement programs in place and zero otherwise: training and development program (EMP-STR-L), labor management (EMP-STR-M), cash profit sharing (EMP-STR-C), employee involvement (EMP-STR-D), retirement benefits strength (EMP-STR-F), human capital-other strength (EMP-STR-X), no-layoff-policy (EMP-STR-B), or employee health and safety (EMP-STR-G). Since data on these variables are only available from 1991 to 2018, the sample is limited to this period.

The estimation results are reported in Panel B of Table 3. The coefficient estimates of the COC proxies are negative and significant only for low labor skills firms in Columns (1) and (2), while they are not significant for firms with high labor skills in Columns (3) and (4). These results indicate that firms requiring low-skilled employees are more likely to increase corporate employment in response to a lower COC. It is also interesting to note that the sensitivity of corporate employment to cash flows (CF) is significant only for firms with a low-skilled labor force.

Columns (5)–(8) present the results for firms with low and high human capital development programs. The coefficient estimates of the COC proxies are significant and negative only for firms with low human capital development programs in Columns (5) and (6). In contrast, they are insignificant for firms with high human capital development programs in Columns (7) and (8). The coefficient estimates of *CF* are also significant only for firms with low human capital development programs. These results provide additional evidence that firms with lower labor adjustment costs are more responsive to fluctuations in the COC and CF.

4.2.3 Asset Specificity and Innovation Intensity

Since firm-specific assets and innovations require employees with firm-specific knowledge, firms' asset specificity and innovation are linked to higher labor adjustment costs (Becker, 1962). Therefore, we expect firms with higher asset specificity and more innovation will be slower in adjusting their employment in response to changes in the COC than those with lower asset specificity and less innovation.

We measure the firm-level asset specificity index (*Wgtppat*) following Berger, Ofek, and Swary (1996); Strömberg (2000); Acharya, Bharath, and Srinivasan (2007). We first obtain the industry liquidity measure by the book value of property, plant, and equipment over total assets for firms in the same 3-digit SIC industry each year. We then calculate the liquidity index by the weighted average of the industry liquidity measure weighted by the firm's segment sales relative to its total sales. A lower liquidity index indicates higher asset specificity. We divide the sample into firms with low and high asset specificity based on the median of this liquidity index. To measure innovation intensity, we obtain firm-level patent application data from Kogan et al. (2017) and define firms with low and high innovation intensity based on the median number of patent applications.

The results reported in Panel C of Table 3 show that the estimated coefficients of the COC proxies are significant for firms with low asset specificity in Columns (1) and (2). However, they are insignificant for firms with high asset specificity in Columns (3) and (4). The coefficient estimates of CF also tend to be significant and positive for firms with low asset specificity. These findings indicate that firms with low asset specificity have higher sensitivities of employment changes to the COC and CF. Columns (5)–(8) report the results for firms with low and high innovation intensity. The coefficient estimates of COC^{LNS} and COC^{FF6} are significant and negative only for firms with low innovation intensity. These results suggest that the employment change of firms with low innovation intensity is more sensitive than that of those with high innovation intensity to the COC. These findings provide further support for the prediction of Hypothesis 2 that labor adjustment costs reduce the sensitivity of corporate employment to the COC.

4.3 Quasi-Experiments

4.3.1 Regulation Fair Disclosure

A potential concern is that the negative relationship between employment and the COC might be driven by unobservable economic factors, such as product demand. It is also possible that employment might affect the COC, which leads to reverse causality. To address this endogeneity concern and establish the causal effect of the COC on corporate employment, we use the Securities and Exchange Commission's Regulation Fair Disclosure implemented in 2000 as a shock to firms' COC. Reg FD forbids selective disclosure of material information to some investors, reducing the COC by leveling the information playing field. Chen, Dhaliwal, and Xie (2010) show that the COCs for firms with high R&D and Tobin's q are significantly reduced in the post-Reg FD period. Accordingly, we use Reg FD as a quasi-experiment to test whether firms with high R&D and firms with high Tobin's q experience more changes in employment with the following DID regression:

$$Y_{it+1} = \alpha_0 + \alpha_1 Post_{it} \times Treat_{it} + \gamma X_{it} + \theta_i + \eta_{jt} + \varepsilon_{it}, \tag{4}$$

where the dependent variable is the change in employment scaled by PPE. *Post* is a dummy variable that equals one for 2000–2002 and zero for 1997–1999. *Treat* is a dummy variable that equals one if the firm has an above-median R&D-to-sales ratio (or top 50% of Tobin's q firms) and zero otherwise. X contains a set of control variables as defined previously. θ_i and η_{jt} are firm and industry-year fixed effects, respectively.

Panel A of Table 4 presents the estimation results of the DID regressions. The results in Columns (1)-(3) are based on R&D, while those in Columns (4)-(6) are based on Tobin's q. The dependent variable in Columns (1) and (2) and Columns (4) and (5) is the COC estimated by COC^{LNS} and COC^{FF6}, respectively. The negative and significant coefficient estimates on *Treat*×*Post* confirms the results of Chen, Dhaliwal, and Xie (2010) that the COC of firms with more selective disclosure before Reg FD declines more following the regulation. Columns (3) and (6) report the results with the change in employment as the dependent variable. The coefficient estimates of the interaction term *Treat*×*Post* are significant and positive, which indicates that treatment firms with more declines in the COC after the implementation of Reg FD experience greater increases in corporate employment than control firms.

To mitigate the concern that the results in Table 4 may be driven by confounding factors unrelated to the shock to the COC, we conduct placebo tests. If confounding factors unrelated to Reg FD drive our results, we should find similar significant effects in other years without shocks to firms' COC. The results of placebo tests using 1995 and 2005 as fictitious event years are reported in Columns (7) and (8), respectively. The dummy variable *Post* equals one for the three years after the fictitious event year and zero for three years before the fictitious event year. The results show that the coefficient estimates of the interaction term *Treat*×*Post* are insignificant. Thus, our results are unlikely to be driven by unknown confounding factors and suggest that the COC has a causal and significant effect on corporate employment.

(Insert Table 4 about here)

It is also possible that the above results simply capture pre-existing differences unrelated to the COC in the treatment and control groups. We explore this possibility by investigating the dynamics of employment changes surrounding the implementation of Reg FD. If this alternative explanation holds, we should observe an upward trend in corporate employment by treatment firms before Reg FD. To check this, we replace *Post* with year indicator variables associated with the years surrounding Reg FD implementation. Figure 1 presents the coefficient estimates for the interaction term $Treat \times Year$ with a 90% confidence interval. The differences in corporate employment between the treated and control groups are close to zero before Reg FD. However, the difference in employment between the treatment and control firms is significant only in the years following the Reg FD. Therefore, our results are less likely to be driven by pre-existing divergent trends in treated and control firms.

Our results in Section 4.2 suggest that low labor adjustment costs facilitate employment adjustment. To provide further evidence on the effect of adjustment costs, we include triple interaction terms by adding an indicator for lower adjustment costs (LAC) which takes a value of one if the firm has lower labor adjustment costs and zero otherwise. The estimation results are reported in Panel B of Table 4. In Columns (1), (3), (5), and (7), LAC is based on labor intensity, while it is based on asset specificity in Columns (2), (4), (6), and (8). The coefficient estimates of the triple interaction, $Treat \times Post \times LAC$, are all positive and significant after Reg FD but insignificant for placebo tests, indicating that low adjustment costs strengthen the treatment effect. These results suggest that firms facing lower labor adjustment costs increase employment more than those facing higher labor adjustment costs in response to lower COC after the implementation of Reg FD. These findings further support Hypothesis 2, that employment adjustment costs reduce the sensitivity of employment to the COC.

4.3.2 Monetary Policy Surprises

To further strengthen the causal effect of the COC on corporate employment, we adopt another identification strategy that explores unanticipated changes to the target federal funds rate (FFR) that plausibly affect firms' COC. The target FFR that banks charge each other on overnight reserves is set eight times a year by the Federal Open Market Committee (FOMC).

Previous studies show that monetary policy surprises affect the COC by influencing equity premia, term premia, and credit spreads (Bernanke and Kuttner, 2005; Gertler and Karadi, 2015; Hanson and Stein, 2015). Thus, a positive (negative) shock to the federal funds rate raises (lowers) the COC. Using monetary policy surprises as shocks to the COC, we examine how such shocks cause employment adjustments across firms with different monetary policy exposures.

Since financial markets are unlikely to respond to monetary policy actions that were already anticipated, it is essential to distinguish between expected and unexpected monetary policy actions. We adopt the measure developed by (Bernanke and Kuttner, 2005), which uses the FFR futures data to capture surprise rate changes. Changes in the federal funds' target are derived from changes in the futures contract price on the announcement date relative to the price the day before the policy action. Specifically, for policy announcement day d of month m, the unexpected target funds rate change is computed from the change in the rate implied by the current-month contract. Since the contract's settlement price is based on the monthly average FFR, the change in the implied futures rate is scaled by the factor related to the number of days in the month as follows:

$$\Delta i^u = \frac{D}{D-d}(f^0_{m,d} - f^0_{m,d-1}), \tag{5}$$

where Δi^u is the unexpected target rate change (surprise), $f^0_{m,d}$ is the current-month futures rate, and D is the number of days in the month.

Since the FOMC started announcing target rate changes at prescheduled dates from February 1994 and the FFR reached the zero lower bound in mid-2008, our sample is limited to 1994-2007. We obtain FOMC meeting dates from the Federal Reserve website and FOMC surprise data from Bernanke and Kuttner (2005). The literature has shown that the impacts of monetary policy surprises on firms' COC depend on firms' exposure to monetary policy, which goes beyond simple adjustments to the risk-free rate (Ippolito, Ozdagli, and Perez-Orive, 2018; Ozdagli and Velikov, 2020). Hence, we follow Ozdagli and Velikov (2020) to construct a monetary policy exposure (MPE) index based on observable firm characteristics linked to monetary policy as follows:

$$\begin{aligned} MPE = & - 1.60 \times WW - 0.87 \times Cash + 0.63 \times CF\text{Duration} \\ & + 4.36 \times CF\text{Volatility} - 5.74 \times \text{Operating Profitability}, \end{aligned} \tag{6}$$

where WW is the Whited and Wu (2006) measure of financial constraints. Cash, Operating Profitability, CF Duration, and CF Volatility capture a firm's access to liquid assets, profitability, expected duration of cash flows, and cash flow volatility, respectively. These firm characteristic variables are defined in Appendix A. As discussed in Ozdagli and Velikov (2020), these firm characteristics capture the effects of various monetary policy transmission mechanisms documented in the literature, including the credit channel, balance sheet liquidity, the discount rate effect, and nominal rigidities.

Using unexpected changes in monetary policy as shocks to firms' COC, we investigate whether the employment of firms that are more-exposed to such changes is affected more than that of less-exposed firms. To this end, we estimate the following model:

$$Y_{it+1} = \alpha_0 + \alpha_1 HMPE_{it} + \alpha_2 HMPE_{it} \times Surp_t + \gamma X_{it} + \theta_i + \eta_{jt} + \varepsilon_{it}, \tag{7}$$

where the dependent variable is the change in employment scaled by PPE. *HMPE* is a dummy variable that equals one if a firm has an above-median level of the MPE and zero otherwise. *Surp* is the average FOMC monetary policy surprise over a fiscal year. X_{it} contains a set of control variables as defined previously. θ_i and η_{jt} are firm and industry-year fixed effects, respectively.

We report the estimation results in Table 5 separately for low and high labor intensity and asset specificity firms. The coefficient estimates of HMPE are negative and significant except for firms with low labor intensity, while those of HMPE*Surp are negative and significant only for high labor intensity firms in Column (3) and for low asset specificity firms in Column (3). These results indicate that larger surprises in FFR have a stronger negative effect on the employment of firms with greater exposure to monetary policy and particularly at firms with low employment adjustment costs. These results suggest that firms with low employment adjustment costs are particularly sensitive to the change in the COC stemming from monetary policy surprises, consistent with Hypothesis 2.

(Insert Table 5 about here)

4.3.3 Inevitable Disclosure Doctrine

Thus far, we find that firms with high and low labor adjustment costs exhibit different sensitivities of employment to the COC. A potential concern is that such differences may reflect some unobserved economic factors that drive the cross-sectional variations among firms. To help establish the causal effects of labor adjustment costs, we exploit the staggered adoptions of inevitable disclosure doctrine (IDD) laws by U.S. state courts as shocks to employment adjustment costs and examine whether affected firms experience a change in sensitivity of employment to the COC. Losing workers with trade secrets to competitors is very costly because the divulgence of such secrets cause the firm significant economic harm (Klasa et al., 2018). The IDD allows firms to prohibit employees with trade secretes from working for competitors, thus effectively reducing the dismissal costs of employees. As discussed in Klasa et al. (2018), state courts' recognition of the IDD is arguably exogenous in that the decision is neither systematically related to changes in local business, political conditions, and lobbying nor anticipated by firms. Using the recognition of the IDD as a quasi-experiment, we examine how shocks to employment adjustment costs affect the sensitivity of corporate employment to the COC. We expect that firms become more sensitive to the COC due to lower employment adjustment costs in affected states relative to those in unaffected states following the adoption of the IDD. To test this conjecture, we estimate the following difference-in-differences model:

$$Y_{ist+1} = \alpha_0 + \alpha_1 COC_{ist} + \alpha_2 IDD_{st} + \alpha_3 IDD_{st} \times COC_{ist} + \gamma X_{ist} + \theta_i + \eta_{jt} + \varepsilon_{ist}, \quad (8)$$

where Y_{ist+1} is the change in corporate employment of firm i headquartered in state s in year $t+1$, and IDD_{st} is a dummy variable equal to one for state-years in which the IDD is in place and zero otherwise.[3] X_{ist} contains a set of control variables defined previously. We also include firm and industry-year fixed effects to control for unobservable differences across firms and industry-years. Similar results are found if we include firm and state-year fixed effects instead (not reported).

We report the results in Table 6. In Columns (1) and (2), the coefficient estimates of the interaction terms between IDD and COC are negative and significant, suggesting that compared with firms located in the unaffected states, firms located in the affected states experience increased sensitivity of employment change to the COC. These results support the view that labor adjustment costs are important in explaining the sensitivity of corporate employment to the COC.

To ease the concern that other confounding factors may drive the results, we conduct placebo tests by randomizing the passage dates of the IDD. In Columns (3) and (4), the fictitious passage dates are set five years before the actual date. The coefficient estimates of the interaction term between IDD and the COC proxies are insignificant, indicating no significant difference in the sensitivity of corporate employment to the COC between firms in the affected states and those

[3]The detailed date of passage is obtained from Qiu and Wang (2018). State-years in which the IDD is in place range from the year of passage of the IDD to the year of its reversal (if any) or the end of the sample period.

in the unaffected states in the absence of shocks to labor adjustment costs.

(Insert Table 6 about here)

4.4 Financial Constraints and Corporate Employment

Our results in Table 3 show that employment of firms with low labor adjustment costs is also more sensitive to cash flows than that of firms with high labor adjustment costs. Since previous studies find that investments of financially constrained and unconstrained firms exhibit different sensitivities to fluctuations in their internal cash flows (Fazzari, Hubbard, and Petersen, 1988; Kaplan and Zingales, 1997), it is important to investigate the influence of financial constraints on the sensitivities of employment to the COC and cash flows (CF). Specifically, we test the prediction of Hypothesis 3 that employment of financially unconstrained firms with low labor adjustment costs is more sensitive to the COC, while employment of financially constrained firms with low adjustment costs is more sensitive to CF.

To test this hypothesis, we divide firms facing high and low labor adjustment costs into financially constrained and unconstrained groups based on the median level of the HP index (Hadlock and Pierce, 2010). We then examine whether differences exist in the sensitivities of employment change to the COC and CF between financially constrained and unconstrained firms. For brevity, we report only the results based on labor intensity and asset specificity as the measures of adjustment costs. The results based on other labor adjustment cost proxies are similar.

The results reported in Table 7 Panel A (Panel B) are based on the COC estimated with the ICC (Fama-French 6-factor model). The coefficients of COC and CF are insignificant for both financially constrained and unconstrained firms when they are less labor-intensive or have higher asset specificity. The results are consistent with the above findings that firms with high adjustment costs exhibit insignificant sensitivity of employment to the COC and CF. Among firms with low labor adjustment costs, the coefficient estimates of COC are negative and significant only for unconstrained firms (low HP) but insignificant for constrained firms (high HP). These results are consistent with our hypothesis that financially unconstrained firms are more flexible in adjusting employment in response to fluctuations in the COC, while financially constrained firms are less flexible in making such adjustments.[4]

The coefficient estimates of CF are positive and significant for constrained firms with high labor intensity (Column (4)) and constrained firms with low asset specificity (Column (6)), while they are insignificant for firms with low labor intensity and high asset specificity. These results indicate that financially constrained firms with low adjustment costs are more likely to use internal cash flows to adjust their employment. Taken together, the results in Table 7 suggest that the sensitivities of employment adjustment to the COC and cash flows are doubly affected by financial constraints and labor adjustment costs, supporting Hypothesis 3.

(Insert Table 7 about here)

5 Robustness Checks

5.1 Measurement Error

Although the DID analysis helps address endogeneity concerns related to unobserved factors, there may still be an endogeneity issue due to measurement error in the COC. To ease this concern, we apply the high-order cumulant estimators developed by Erickson, Jiang, and Whited (2014). They show that this estimator is asymptotically equivalent to the high order moments estimator developed by Erickson and Whited (2000, 2002) but performs better in finite samples.

[4]The correlation between the COC and HP variable is approximately 0.2. Thus, a high HP value does not necessarily imply a high COC.

The estimation results are reported in Table 8. The table shows that the impact of the COC on corporate employment remains negative and significant for all COC proxies. These results suggest that errors-in-variable biases are unlikely to drive the relationship between the COC and corporate employment.

(Insert Table 8 about here)

5.2 Alternative Corporate Employment Measures

We construct four alternative proxies to check whether our results are driven by a particular corporate employment measure. The first measure is the change in the number of employees divided by the average number of employees ($Demp_t = \frac{\Delta Emp_t}{0.5\times(Emp_t+Emp_{t+1})}$) as in Belo, Lin, and Bazdresch (2014). The second measure is the percentage change in the number of employees ($Empg_t = \frac{\Delta Emp_t}{Emp_t}$) as in Ben-Nasr and Alshwer (2016).

Following Donangelo et al. (2019), we construct two additional measures that are relevant to labor expenditure, namely, the percentage changes in labor expenditures (*dLabex*) and labor share (*dLabshare*). Specifically, *Labex* is calculated as:

$$Labex = WAGE^I * \left(\frac{EMP_{i,t-1} + EMP_{i,t}}{2}\right), \tag{9}$$

where $WAGE^I$ is the average annual wage at the industry level obtained from the Occupational Employment Statistics compiled by the U.S. Bureau of Labor Statistics.[5] *Labshare* is calculated as labor expenditures (*Labex*) over the sum of operating income before depreciation (*OIBDP*), change in inventories (ΔINV), and labor expenditures:

$$Labshare = \frac{Labex}{OIBDP + \Delta INV + Labex}. \tag{10}$$

[5] Donangelo et al. (2019) use the average wage of firms with non-missing XLR in the same industry as the measure of the industry average annual wage. However, we use the industry annual wage contained in the Occupational Employment Statistics due to severe missing data problems. The sample period for this measure starts in 1997, when the data became available. Note that the industry is based on the 3-digit SIC code for years before 2001 and NAICS industry classification for years from 2001.

The results using the alternative corporate employment measures are reported in Table 9. The estimated coefficients of COC based on these alternative measures of corporate employment are all negative and significant, indicating that our results are robust to alternative measures of corporate employment. We also confirm that the employment of firms with low labor adjustment costs is more sensitive to the COC than that of firms with high labor adjustment costs (not reported).

(Insert Table 9 about here)

5.3 Alternative Model Specifications

We also consider alternative model specifications to ensure the robustness of our results. First, we estimate regressions by excluding recession periods to alleviate the concern that economic downturns may drive the negative association between the COC and corporate employment. Recession periods are identified according to the NBER definition: 1980-1982; 1990-1991; 2001; 2007-2009; and 2020. Second, we estimate a least absolute deviation regression model to reduce the effects of outliers. The results are reported in Table 10. When we estimate the model excluding the 2020 Covid-19 period (Columns (1) and (2)), the coefficient estimates of COC are negative and significant. Columns (3) and (4) show that the COC still has negative and significant effects on corporate employment during non-recession periods, which confirms that economic downturns do not drive our findings. The negative and significant coefficient estimates of COC with the least absolute deviation regressions (Columns (5) and (6)) indicate that our main findings are unlikely to be driven by outliers.

(Insert Table 10 about here)

6 Conclusions

We find that the COC has a negative impact on corporate employment. The sensitivity of corporate employment to the COC is affected by labor adjustment costs. The employment of firms with lower labor adjustment costs is more sensitive to the COC than that of firms with higher labor adjustment costs. We further show that firms' employment adjustments are also affected by their access to external finance. The employment of financially unconstrained firms with low adjustment costs is more responsive to the COC, while that of financially constrained firms with low adjustment costs is more responsive to internal cash flows. These results indicate that financial constraints and adjustment costs concurrently affect firms' employment decisions. Exploiting shocks to the COC and labor adjustment costs, we provide evidence for their causal impacts on firms' employment.

In sum, our results suggest that labor adjustment costs prevent firms from quickly responding to fluctuations in the COC. Labor and financial market frictions play important roles in explaining the sensitivity of corporate employment to the COC. Thus, policymakers need to recognize and address frictions in both labor and financial markets when it comes to economic policies intending to increase employment at the firm level.

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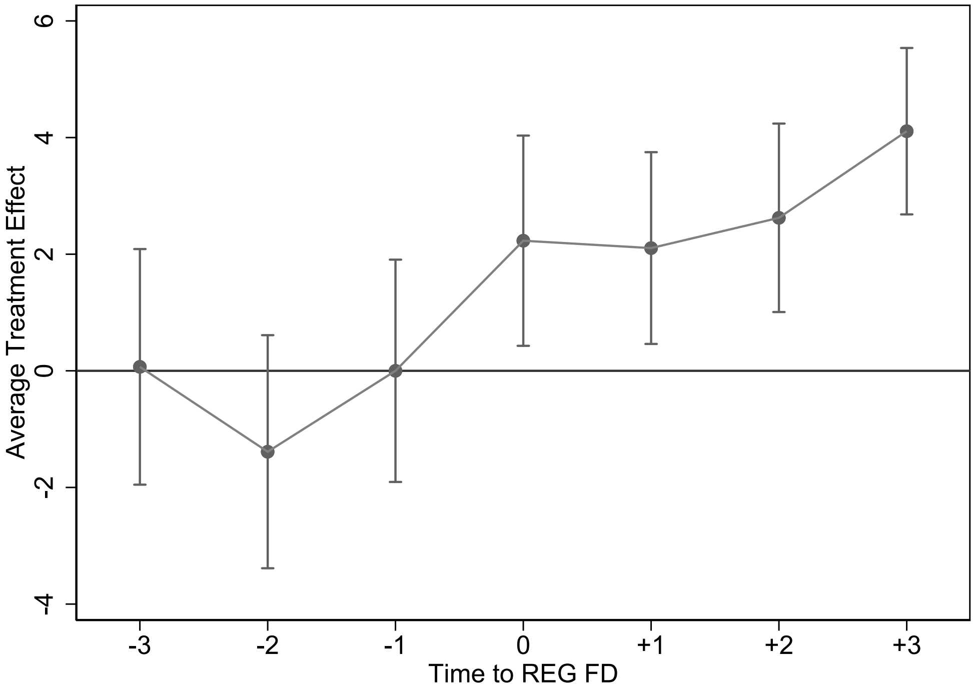

Figure 1: Dynamic Effect of Shocks on the Cost of Capital

The figure shows the dynamic effect of shocks on the cost of capital with a 90% confidence interval. The treatment firms have the above-median R&D-to-Sales ratio before the introduction of Reg FD. The year 0 denotes the year when Reg FD was introduced. The baseline group is set to be year -3.

Table 1: Descriptive Statistics

This table presents descriptive statistics of key variables for a sample of US-listed firms from 1976 to 2020. *Hinv* is the change in corporate employees scaled by lagged property, plant, and equipment. *Demp* is the change in firm employees scaled by average employees in year t and $t-1$ following Belo, Lin, and Bazdresch (2014). *Empg* is the percentage change in the corporate employees. *dLabex* is the percentage change in labor expenditure, where labor expenditure is calculated as average employees in year t and $t-1$ multiplied by industry-average annual wage obtained from Occupational Employment Statistics complied by U.S. Bureau of Labor Statistic, following Donangelo et al. (2019). COC^{LNS}, COC^{GLS}, and COC^{EAS} are the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013), Gebhardt, Lee, and Swaminathan (2001), and Easton (2004), respectively. COC^{FF3}, COC^{FF4}, and COC^{FF6} are the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French three-factor, Carhart four-factor models, and Fama-French five factor+momentum model, respectively. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). *CF* is operating income before depreciation over total assets. *Capx* is capital expenditure over property, plant, and equipment. *Tobinq* is the Tobin's q developed by Peters and Taylor (2017). *Size* is the natural logarithm of total assets. *Age* is firm age calculated as the natural logarithm of the number of years since the firm's inception in CRSP. *Lev* is total liabilities over total assets. *Div* is common and preferred dividends over total assets. *Cash* is cash and short-term investments over total assets. *FA* is property, plant and equipment over total assets. Detailed variable definitions are provided in Appendix.

	Mean	S.D.	Q5	Q25	Median	Q75	Q95	N
Hinv	4.352	18.519	-11.637	-0.741	0.565	4.786	31.315	64,998
Demp	0.047	0.180	-0.234	-0.036	0.031	0.118	0.382	64,569
Empg	0.063	0.199	-0.210	-0.035	0.031	0.125	0.451	64,340
dLabex	0.080	0.152	-0.161	0.000	0.067	0.153	0.357	23,172
dels	0.011	0.141	-0.187	-0.034	0.001	0.042	0.245	23,172
COC^{LNS}	0.127	0.059	0.060	0.086	0.112	0.153	0.250	65,765
COC^{GLS}	0.097	0.027	0.059	0.079	0.093	0.110	0.148	65,765
COC^{EAS}	0.117	0.043	0.064	0.087	0.109	0.139	0.202	65,765
COC^{FF3}	0.107	0.065	0.012	0.065	0.101	0.143	0.224	65,765
COC^{FF4}	0.097	0.077	-0.019	0.052	0.090	0.138	0.233	65,765
COC^{FF6}	0.095	0.104	-0.081	0.042	0.095	0.153	0.264	65,765
CF	0.140	0.089	0.000	0.090	0.137	0.189	0.291	65,765
Capx	0.249	0.155	0.061	0.140	0.212	0.321	0.568	65,604
Tobinq	1.127	1.517	-0.091	0.308	0.692	1.333	3.956	65,721
Size	6.311	1.788	3.530	4.992	6.193	7.528	9.493	65,765
Age	2.757	0.764	1.609	2.197	2.773	3.296	4.060	65,611
Lev	0.219	0.176	0.000	0.063	0.203	0.332	0.548	65,765
Div	0.013	0.021	0.000	0.000	0.005	0.020	0.053	65,659
Cash	0.135	0.151	0.005	0.025	0.076	0.193	0.474	65,765
FA	0.285	0.212	0.034	0.119	0.235	0.396	0.739	65,765

Table 2: The Cost of Capital and Corporate Employment

This table presents the association between the weighted average cost of capital and corporate employment for a sample of US-listed firms from 1976 to 2020. The dependent variable *Hinv* is the change in corporate employees scaled by lagged property, plant, and equipment. COC^{LNS}, COC^{GLS}, and COC^{EAS} are the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013), Gebhardt, Lee, and Swaminathan (2001), and Easton (2004), respectively. COC^{FF3}, COC^{FF4}, and COC^{FF6} are the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French three-factor, Carhart four-factor models, and Fama-French five factor+momentum model, respectively. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). *CF* is operating income before depreciation over total assets. *Capx* is capital expenditure over property, plant, and equipment. *Tobinq* is the Tobin's q developed by Peters and Taylor (2017). *Size* is the natural logarithm of total assets. *Age* is firm age calculated as the natural logarithm of the number of years since the firm's inception in CRSP. *Lev* is total liabilities over total assets. *Div* is common and preferred dividends over total assets. *Cash* is cash and short-term investments over total assets. *FA* is property, plant and equipment over total assets. All regressions include firm and industry-year fixed effects. The 2-digit SIC code is used as the industry classification. Detailed variable definitions are provided in Appendix. The *t*-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
COC^{LNS}	-4.976**					
	(-2.48)					
COC^{GLS}		-10.282*				
		(-1.70)				
COC^{EAS}			-10.625***			
			(-3.18)			
COC^{FF3}				-4.289**		
				(-2.17)		
COC^{FF4}					-3.448**	
					(-2.15)	
COC^{FF6}						-2.785**
						(-2.36)
CF	8.226***	9.452***	7.767***	9.109***	9.207***	9.211***
	(4.41)	(5.10)	(4.13)	(4.93)	(4.98)	(4.99)
Capx	0.924	1.032	0.846	1.040	1.086	1.076
	(0.97)	(1.09)	(0.88)	(1.10)	(1.14)	(1.13)
Tobinq	1.389***	1.372***	1.372***	1.396***	1.407***	1.405***
	(10.29)	(10.05)	(10.15)	(10.36)	(10.41)	(10.41)
Size	-4.442***	-4.419***	-4.473***	-4.408***	-4.392***	-4.383***
	(-17.73)	(-17.85)	(-17.90)	(-17.68)	(-17.69)	(-17.69)
Age	-0.201	-0.214	-0.193	-0.196	-0.213	-0.205
	(-0.61)	(-0.65)	(-0.58)	(-0.59)	(-0.64)	(-0.62)
Lev	-5.395***	-5.471***	-5.664***	-5.340***	-5.275***	-5.247***
	(-6.07)	(-6.05)	(-6.33)	(-6.00)	(-5.96)	(-5.93)
Div	-16.715**	-18.776***	-16.428**	-18.086**	-17.797**	-17.608**
	(-2.28)	(-2.58)	(-2.24)	(-2.46)	(-2.42)	(-2.40)
Cash	8.436***	8.491***	8.322***	8.643***	8.615***	8.588***
	(6.33)	(6.38)	(6.24)	(6.50)	(6.48)	(6.46)
FA	-13.119***	-13.289***	-13.068***	-13.238***	-13.258***	-13.256***
	(-9.77)	(-9.88)	(-9.72)	(-9.84)	(-9.85)	(-9.85)
Firm FE	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y
Observations	55,008	55,008	55,008	55,008	55,008	55,008
Number of Firms	4,921	4,921	4,921	4,921	4,921	4,921
Adjusted R^2	0.25	0.25	0.25	0.25	0.25	0.25

Table 3: The Impacts of Labor Adjustment Costs

This table presents the impacts of labor adjustment cost on the relationship between weighted average cost of capital and corporate employment for a sample of US-listed firms from 1976 to 2020. In Panel A, Columns (1)–(4) include firms with below- or above-median level of labor intensity, calculated as employment over property, plant, and equipment. Columns (5)–(8) include firms with a low or high level of union relations. Firms are defined as having high union relations if they are reported with strong strength in union relations (item EMP-STR-A). They are defined as having low union relations if firms are reported with strong concerns in union relations (item EMP-CON-A). The information on union relations is obtained from the MSCI KLD STATS database. In Panel B, Columns (1)–(4) include firms that possess a low- or high-skill workforce. The firms that rely on a highly skilled or highly-trained workforce are identified by item EMP-STR-L in the MSCI KLD STATS database. Columns (5)–(8) include firms with a low or high level of human capital development. Human capital development is high if the firm has any of the following in place: training and development program (EMP-STR-L), labor management (EMP-STR-M), cash profit sharing (EMP-STR-C), employee involvement (EMP-STR-D), retirement benefits strength (EMP-STR-F), human capital-other strength (EMP-STR-X), no-layoff-policy (EMP-STR-B), and employee health and safety (EMP-STR-G). In Panel C, Columns (1)–(4) include firms with below- or above-median levels of asset specificity (Berger, Ofek, and Swary, 1996; Strömberg, 2000; Acharya, Bharath, and Srinivasan, 2007). First, the industry liquidity index is calculated as the mean value of book value of property, plant, and equipment over total assets for the firms in the same 3-digit SIC industry in each year. Then we calculate the firm-level asset specificity index as the weighted average of the industry liquidity index based on the weight of the firm's segment sales in total firm sales. Columns (5)–(8) include firms with below- or above-median level of innovation intensity measured by the number of patents granted to firm i in year t. The dependent variable *Hinv* is the change in corporate employees scaled by lagged property, plant, and equipment. COC^{LNS} is the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013). COC^{FF6} is the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French five factor+momentum model. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). *CF* is operating income before depreciation over total assets. Other control variables include *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and industry-year fixed effects. The 2-digit SIC code is used as the industry classification. Detailed variable definitions are provided in Appendix. The t-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Labor Intensity and Union Relations

	Labor Intensity				Union Relations			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Low	Low	High	High	Low	Low	High	High
COC^{LNS}	-0.643		-8.715**		-9.590***		-4.334	
	(-0.60)		(-2.29)		(-2.69)		(-1.19)	
COC^{FF6}		-1.116		-4.031**		-3.824*		-2.481
		(-1.49)		(-2.01)		(-1.74)		(-1.36)
CF	0.484	0.620	15.491***	17.190***	10.692***	14.874***	0.912	1.726
	(0.42)	(0.56)	(4.22)	(4.70)	(3.58)	(4.58)	(0.32)	(0.62)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	26,856	26,856	27,108	27,108	21,338	20,156	17,594	17,594
Number of Firms	2,690	2,690	3,246	3,246	3,451	3,364	2,009	2,009
Adjusted R^2	0.24	0.24	0.26	0.26	0.25	0.24	0.30	0.30

Panel B. Labor Skills and Human Capital Development Program

	Labor Skills				Human Capital Development			
	(1) Low	(2) Low	(3) High	(4) High	(5) Low	(6) Low	(7) High	(8) High
COC^{LNS}	-8.667***		-3.456		-10.104***		-2.944	
	(-3.08)		(-0.23)		(-2.67)		(-0.87)	
COC^{FF6}		-2.825*		-4.425		-3.660*		-2.926
		(-1.86)		(-1.27)		(-1.83)		(-1.60)
CF	7.416***	9.008***	0.552	0.170	9.916***	11.580***	-0.951	-0.290
	(3.27)	(4.03)	(0.12)	(0.04)	(3.11)	(3.66)	(-0.33)	(-0.10)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	31,325	31,325	8,265	8,265	20,502	20,502	18,680	18,680
Number of Firms	3,695	3,695	1,424	1,424	3,281	3,281	1,999	1,999
Adjusted R^2	0.27	0.27	0.26	0.26	0.26	0.26	0.27	0.27

Panel C. Asset Specificity and Innovation Intensity

	Asset Specificity				Innovation Intensity			
	(1) Low	(2) Low	(3) High	(4) High	(5) Low	(6) Low	(7) High	(8) High
COC^{LNS}	-7.501**		-1.998		-8.720**		-0.529	
	(-1.96)		(-1.05)		(-2.58)		(-0.23)	
COC^{FF6}		-3.902**		-0.987		-4.039**		-1.294
		(-2.14)		(-0.68)		(-2.21)		(-0.91)
CF	12.234***	13.400***	3.462	3.941*	8.206***	9.580***	5.490**	5.672***
	(4.02)	(4.38)	(1.64)	(1.90)	(2.68)	(3.12)	(2.49)	(2.68)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	26,180	26,180	27,986	27,986	30,128	30,128	24,098	24,098
Number of Firms	3,034	3,034	2,768	2,768	3,649	3,649	2,027	2,027
Adjusted R^2	0.25	0.25	0.25	0.25	0.25	0.25	0.21	0.21

Table 4: Change in Corporate Employment around Reg FD

This table presents the effects of shocks to the cost of capital on corporate employment for a sample of US-listed firms around the introduction of Regulation Fair Disclosure of 2000 (Reg FD). The dependent variables COC^{LNS} and COC^{FF6} are weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013) and Fama-French five factor+momentum model, respectively. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). The dependent variable *Hinv* is the change in corporate employees scaled by lagged property, plant, and equipment. In Panel A, the treated firms in Columns (1)–(3) have the above-median R&D-to-sales ratio before Reg FD. The treated firms in Columns (4)–(6) have the above-median Tobin's q prior to Reg FD. Columns (7) and (8) report placebo tests based on fictitious event years of 1995 and 2005. In placebo tests the treated firms are defined similarly as those in Columns (1)–(3). In Panel B, the treated firms in Columns (1) and (2) have the above-median R&D-to-Sales ratio prior to Reg FD. The treated firms in Columns (3) and (4) have the above-median Tobin's q before Reg FD. Columns (5)–(8) report placebo tests based on fictitious event years of 2005. In Columns (1), (3), (5) and (7), *LAC* is a dummy variable that equals one if the firms have above-median labor intensity in a fiscal year and zero otherwise. In Columns (2), (4), (6) and (8), *LAC* is a dummy variable that equals one if the firms have low-median asset specificity in a fiscal year and zero otherwise. *Post* is a dummy variable that equals one for the period from 2001–2003 and zero for the period from 1997–1999. Other control variables include *CF*, *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and year fixed effects. Detailed variable definitions are provided in Appendix. The *t*-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Shock of Reg FD

	Reg FD (R&D)			Reg FD (Q)			Placebo Tests	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	COC^{LNS}	COC^{FF6}	Hinv	COC^{LNS}	COC^{FF6}	Hinv	Hinv	Hinv
Treat*Post	-0.007**	-0.018***	2.796**	-0.014***	-0.008	1.788*	1.007	-0.585
	(-2.33)	(-2.76)	(2.12)	(-6.33)	(-1.58)	(1.75)	(0.88)	(-0.51)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	8,579	8,579	8,571	8,576	8,576	8,382	8,059	9,076
Number of Firms	1,779	1,779	1,778	1,778	1,778	1,752	1,581	1,805
Adjusted R^2	0.52	0.51	0.28	0.53	0.51	0.26	0.33	0.28

Panel B. Labor Adjustment Costs

	Reg FD (R&D)		Reg FD (Q)		Placebo Tests			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hinv	Hinv	Hinv	Hinv	Hinv	Hinv	Hinv	Hinv
Treat*Post	1.453	3.520***	-0.789	0.788	-0.565	-0.477	-1.398**	-2.004***
	(1.34)	(2.92)	(-1.07)	(0.83)	(-0.64)	(-0.50)	(-2.45)	(-2.87)
Treat*Post*LAC	6.108***	4.141*	4.641**	5.901***	-0.225	0.071	-1.525	-0.416
	(2.90)	(1.70)	(2.44)	(2.83)	(-0.14)	(0.05)	(-1.08)	(-0.28)
Post*LAC	-11.832***	-3.245	-6.323***	-3.954**	-1.354	-0.465	-0.715	-0.084
	(-7.20)	(-1.62)	(-4.83)	(-2.32)	(-1.13)	(-0.38)	(-0.79)	(-0.07)
Treat*LAC	-3.046	-2.675	2.879	-2.483	-0.411	-1.709	2.412	-1.942
	(-1.26)	(-0.99)	(1.34)	(-1.25)	(-0.20)	(-0.78)	(1.33)	(-1.11)
LAC	12.952***	2.132	9.845***	2.166	4.996***	1.373	3.376***	1.519
	(6.06)	(0.84)	(5.93)	(1.19)	(3.29)	(0.76)	(3.09)	(0.92)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	8,239	8,239	8,237	8,237	9,076	9,076	9,076	9,076
Number of Firms	1,787	1,787	1,786	1,786	1,805	1,805	1,805	1,805
Adjusted R^2	0.30	0.29	0.30	0.28	0.29	0.28	0.29	0.28

Table 5: Monetary Policy Surprises

This table presents the effects of FOMC monetary policy surprises on corporate employment for a sample of US-listed firms from 1994 to 2007. We divide the sample into two parts based on the median level of labor intensity and asset specificity. The dependent variable *Hinv* is the change in corporate employees scaled by lagged property, plant, and equipment. *HMPE* is a dummy variable that equals one if the firm has the above-median level of monetary policy exposure (MPE) index and zero otherwise, where the index is constructed following Ozdagli and Velikov (2020). *Surp* is the average FOMC monetary policy surprise over a fiscal year. Other control variables include *CF*, *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and industry-year fixed effects. Detailed variable definitions are provided in Appendix. The *t*-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Labor Intensity		Asset Specificity	
	(1) Low	(2) High	(3) Low	(4) High
HMPE	0.419*	-2.542***	-1.849**	-0.743*
	(1.71)	(-3.44)	(-2.51)	(-1.79)
HMPE*Surp	-0.006	-0.216*	-0.309***	-0.028
	(-0.20)	(-1.81)	(-2.62)	(-0.46)
Surp	0.086*	0.122	0.197	0.110
	(1.72)	(0.84)	(1.33)	(1.12)
Controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observations	12,217	11,939	11,458	12,721
Number of Firms	1,756	2,001	1,935	1,784
Adjusted R^2	0.27	0.29	0.29	0.25

Table 6: Shocks to Labor Adjustment Costs

This table presents the effects of shocks to labor adjustment costs on corporate employment for a sample of US-listed firms around the staggered adoption of Inevitable Disclosure Doctrine (IDD) laws. We identify the treated firm based on the state of the firm's headquarter. The post-treatment period ranges from the adoption of the IDD to the reversal (if any) of IDD or till the end of the sample period. The detailed date of state court adoption of IDD is obtained from Qiu and Wang (2018). In Columns (3) and (4) we conduct placebo tests in which the artificial date of passage is set to be five years before the actual date of passage. The dependent variable *Hinv* is the change in corporate employees scaled by lagged property, plant, and equipment. *IDD* is the state-year that has adopted the Inevitable Disclosure Doctrine laws. COC^{LNS} is the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013). COC^{FF6} is the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French five factor+momentum model. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). Other control variables include *CF*, *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and industry-year fixed effects. The 2-digit SIC code is used as the industry classification. Detailed variable definitions are provided in Appendix. The *t*-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	IDD		Placebo Tests	
	(1)	(2)	(3)	(4)
IDD*COC^{LNS}	-3.549*		-0.671	
	(-1.77)		(-0.34)	
IDD*COC^{FF6}		-3.217***		-1.599
		(-2.66)		(-1.32)
IDD	0.403	0.309	0.236	0.313
	(1.48)	(1.53)	(0.84)	(1.54)
COC^{LNS}	-3.349**		-4.428***	
	(-2.34)		(-2.89)	
COC^{FF6}		0.562		0.031
		(0.66)		(0.03)
Controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observations	55,008	55,008	55,008	55,008
Number of Firms	4,921	4,921	4,921	4,921
Adjusted R^2	0.28	0.28	0.28	0.28

Table 7: External Finance Accessibility and Corporate Employment

This table compares firms with different access to external finance by examining the association between the weighted average cost of capital and corporate employment conditional on financial constraint and labor adjustment costs for a sample of US-listed firms from 1976 to 2020. Columns (1)–(4) include firms with below- or above-median level of labor intensity, calculated as employment over property, plant, and equipment. In Columns (5)–(8), the sample is divided into two parts based on the median level of asset specificity, defined as the weighted average of the industry liquidity index of the firm's segments (Berger, Ofek, and Swary, 1996; Strömberg, 2000; Acharya, Bharath, and Srinivasan, 2007), where the weights are the ratio of segment net sales to total firm net sales, and the industry liquidity index is the median book value of property, plant, and equipment scaled by total assets among the firms with the same the 3-digit SIC code. In each group we further divide the sample into financially constrained firms and financially unconstrained firms. The financially constrained firms are firms with a high HP index. The HP index is calculated following Hadlock and Pierce (2010). The dependent variable *Hinv* is the change in firm employment scaled by lagged property, plant, and equipment. In Panel A, COC^{LNS} is the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013). In Panel B, COC^{FF6} is the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French five factor+momentum model. *CF* is operating income before depreciation over total assets. Other control variables include *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and industry-year fixed effects. The 2-digit SIC code is used as the industry classification. Detailed variable definitions are provided in Appendix. The *t*-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Impacts of COC^{LNS} and Cash Flow

	Low Labor Intensity		High Labor Intensity		Low Asset Specificity		High Asset Specificity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Low HP	High HP	Low HP	High HP	Low HP	High HP	Low HP	High HP
COC^{LNS}	-1.512	1.196	-11.325**	-2.065	-15.177***	-2.626	-0.709	-3.436
	(-1.44)	(0.61)	(-2.15)	(-0.34)	(-3.05)	(-0.44)	(-0.32)	(-0.97)
CF	0.562	2.417	8.054	16.452***	-0.410	14.662***	0.060	1.182
	(0.47)	(1.30)	(1.43)	(3.12)	(-0.10)	(3.56)	(0.02)	(0.36)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	13,795	12,270	14,254	12,180	13,623	11,674	14,397	12,979
Number of Firms	1,255	2,085	1,590	2,520	1,456	2,331	1,286	2,261
Adjusted R^2	0.24	0.23	0.23	0.30	0.25	0.26	0.21	0.27

Panel B. Impacts of COC^{FF6} and Cash Flow

	Low Labor Intensity		High Labor Intensity		Low Asset Specificity		High Asset Specificity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Low HP	High HP	Low HP	High HP	Low HP	High HP	Low HP	High HP
COC^{FF6}	0.761	-1.301	-10.683**	-3.494	-5.049*	2.324	-0.584	0.770
	(0.87)	(-1.07)	(-2.09)	(-0.96)	(-1.81)	(0.48)	(-0.32)	(0.36)
CF	0.808	2.177	10.310*	18.718***	6.936	14.946***	0.259	1.926
	(0.68)	(1.02)	(1.84)	(3.24)	(1.63)	(3.62)	(0.10)	(0.59)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	13,795	10,562	14,254	10,667	13,760	11,674	14,397	12,979
Number of Firms	1,255	1,875	1,590	2,274	1,341	2,331	1,286	2,261
Adjusted R^2	0.24	0.21	0.23	0.29	0.22	0.26	0.21	0.27

Table 8: High-Order Cumulants Estimation

This table presents a high-order cumulants estimation of the association between the weighted average cost of capital and corporate employment for a sample of US-listed firms from 1976 to 2020. The dependent variable *Hinv* is the change in firm employment scaled by lagged property, plant, and equipment. COC^{LNS}, COC^{GLS}, and COC^{EAS} are the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013), Gebhardt, Lee, and Swaminathan (2001), and Easton (2004), respectively. COC^{FF3}, COC^{FF4}, and COC^{FF6} are the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French three-factor, Carhart four-factor models, and Fama-French five factor+momentum model, respectively. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). Other control variables include *CF*, *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. The cost of capital is treated as a misspecified variable. We use fourth-order cumulants following Erickson, Parham, and Whited (2017) and perform within-firm transformation before estimation. Detailed variable definitions are provided in Appendix. The t-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
COC^{LNS}	-1.909***					
	(-4.39)					
COC^{GLS}		-1.572***				
		(-8.05)				
COC^{EAS}			-2.394***			
			(-4.98)			
COC^{FF3}				-0.862***		
				(-8.20)		
COC^{FF4}					-0.466***	
					(-5.40)	
COC^{FF6}						-0.541***
						(-5.77)
Controls	Y	Y	Y	Y	Y	Y
Observations	55,968	55,968	55,968	55,968	55,968	55,968
ρ	0.09	0.06	0.10	0.08	0.07	0.07

Table 9: Alternative Corporate Employment Measures

This table presents the association between the weighted average cost of capital and corporate employment, change in labor expenditure, and labor share for a sample of US-listed firms from 1976 to 2020. The dependent variable in Columns (1) and (2), *Empg* is the change in corporate employees scaled by lagged employees. The dependent variable in Columns (3) and (4), *Demp* is the change in corporate employees scaled by average employees in year t and t-1 following Belo, Lin, and Bazdresch (2014). The dependent variable in Columns (5) and (6), *dLabex* is the percentage change in labor expenditure, where labor expenditure is calculated as average employees in year t and t-1 multiplied by industry-average annual wage obtained from Occupational Employment Statistics complied by U.S. Bureau of Labor Statistic, following Donangelo et al. (2019). The dependent variable in Columns (7) and (8), *dLabshare* is the change in labor share, where the labor share is calculated as labor expenditure over the sum of operating income before depreciation, labor expenditure, and change in inventories, following Donangelo et al. (2019). The sample in Columns (3)–(6) covers the period of 1999–2016. COC^{LNS} is the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013). COC^{FF4} is the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Carhart 4-factor model. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). Other control variables include *CF*, *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and year fixed effects. Detailed variable definitions are provided in Appendix. The t-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Empg		Demp		dLabex		dLabshare	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
COC^{LNS}	-0.080***		-0.073***		-0.209**		-0.137***	
	(-3.56)		(-3.51)		(-2.08)		(-3.56)	
COC^{FF6}		-0.022*		-0.021*		-0.072**		-0.077***
		(-1.73)		(-1.88)		(-2.08)		(-2.72)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	54,407	54,407	54,567	54,567	21,882	21,882	22,626	22,626
Number of Firms	4,870	4,870	4,878	4,878	2,432	2,432	2,479	2,479
Adjusted R^2	0.20	0.20	0.20	0.20	0.48	0.48	0.13	0.13

Table 10: Alternative Sample Period and Estimation Technique

This table presents the association between the weighted average cost of capital and corporate employment for a sample of US-listed firms from 1976 to 2020. The dependent variable *Hinv* is the change in corporate employees scaled by property, plant, and equipment. Columns (1) and (2) exclude the year of 2020 as the COVID-19 period. Columns (3) and (4) exclude NBER recession periods. Columns (5) and (6) report results of least absolute deviation (LAD) regression. COC^{LNS} is the weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013). COC^{FF6} is the weighted average of the cost of capital with the cost of debt and the cost of equity estimated from the Fama-French five factor+momentum model. The cost of debt is measured by the actual yield on the debt carried by the firm (Frank and Shen, 2016). Other control variables include *CF*, *Capx*, *Tobinq*, *Size*, *Age*, *Lev*, *Div*, *Cash*, and *FA*. All regressions include firm and industry-year fixed effects. The 2-digit SIC code is used as the industry classification. Detailed variable definitions are provided in Appendix. The *t*-statistics based on robust standard errors clustered by the firm are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Exclude COVID-19 period		Exclude Recession Period		LAD Regression	
	(1)	(2)	(3)	(4)	(5)	(6)
COC^{LNS}	-4.976**		-6.251***		-0.841***	
	(-2.48)		(-2.64)		(-3.47)	
COC^{FF6}		-2.785**		-3.326**		-0.712***
		(-2.36)		(-2.40)		(-5.80)
Control	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y
Observations	55,008	55,008	43,842	43,842	55,968	55,968
Number of Firms	4,921	4,921	4,701	4,701		
Adjusted R^2	0.25	0.25	0.26	0.26		

Appendix to

The Cost of Capital and Corporate Employment

Table A1: Variable Definitions

Variable	Definitions
Hinv	Change in firm employees / lagged property, plant, and equipment
Empg	Percentage change in corporate employees
Demp	Change in corporate employees / average employees in year t-1 and t
dLabex	Percentage change in labor expenditure, where labor expenditure is calculated as the number of employees multiplied by industry-average annual wage obtained from Occupational Employment Statistics complied by U.S. Bureau of Labor Statistic, following Donangelo et al. (2019).
Labshare	Labor share, calculated as labor expenditure over the sum of operating income before depreciation, labor expenditure, and change in inventories, following Donangelo et al. (2019).
COC^{LNS}	Weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Li, Ng, and Swaminathan (2013).
COC^{GLS}	Weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Gebhardt, Lee, and Swaminathan (2001).
COC^{EAS}	Weighted average cost of capital with the cost of debt and the implied cost of capital estimates following Easton (2004).
COC^{FF3}	Weighted average cost of capital with the cost of debt and the monthly expected returns estimated by Fama-French 3-factor model. $Ret^{FF3}_{i,t+1} = R_{f,t+1} + \hat{\beta}_1 E[MKT_t] + \hat{\beta}_2 E[SMB_t] + \hat{\beta}_3 E[HML_t]$. β is estimated by past five years of monthly stock returns. MKT, SMB, HML are the expected factor premiums calculated as the historical average up to the forecast date.
COC^{FF4}	Weighted average cost of capital with the cost of debt and the monthly expected returns estimated by Carhart 4-factor model. $Ret^{FF4}_{i,t+1} = R_{f,t+1} + \hat{\beta}_1 E[MKT_t] + \hat{\beta}_2 E[SMB_t] + \hat{\beta}_3 E[HML_t] + \hat{\beta}_4 E[UMD_t]$. β is estimated by past five years of monthly stock returns. MKT, SMB, HML, UMD are the expected factor premiums calculated as the historical average up to the forecast date.
COC^{FF6}	Weighted average cost of capital with the cost of debt and the monthly expected returns estimated by Fama-French five factor+momentum model. $Ret^{FF4}_{i,t+1} = R_{f,t+1} + \hat{\beta}_1 E[MKT_t] + \hat{\beta}_2 E[SMB_t] + \hat{\beta}_3 E[HML_t] + \hat{\beta}_4 E[CMW_t] + \hat{\beta}_5 E[CMA_t] + \hat{\beta}_6 E[UMD_t]$. β is estimated by past five years of monthly stock returns. MKT, SMB, HML, RMW, CMA, and UMD are the expected factor premiums calculated as the historical average up to the forecast date.
Tobinq	Tobin's q developed by Peters and Taylor (2017).
Capx	Capital expenditure / Property, plant, and equipment
CF	Operating income before depreciation / total assets
Size	Natural logarithm of total assets
Age	Natural logarithm of the number of years since the firms' inception in CRSP
Lev	Total liabilities / total assets
Div	(Common dividend + preferred dividends) / total assets
Cash	Cash and short-term investments / total assets
FA	Property, plant, and equipment / total assets
SG	Percentage change in corporate sales
MPE	Monetary policy exposure as defined in Ozdagli and Velikov (2020). $MPE = -1.60 \times WW - 0.87 \times Cash + 0.63 \times CFDuration + 4.36 \times CFVolatility - 5.74 \times OP$, where WW denotes the financial constraint measure estimated following Whited and Wu (2006); *Cash* is defined as cash and short-term investments (CHE) scaled by total assets; *CFDuration* is the cash flow duration measure estimated following Dechow, Sloan, and Soliman (2004). *CFVolatility* is calculated as standard deviation over the last 20 quarters of cash flows, measured by operating cash flow scaled by total assets; and *OP* is defined as sales (SALE) minus cost of goods sold (COGS), scaled by total assets.

Appendix B. Implied Cost of Capital Estimation

Following Li, Ng, and Swaminathan (2013), we assume that the steady-state earning growth rate after 15 years (g_t) will be a rolling average of annual GDP growth rate: e.g. $g_t = ICC_t \times b_t$, where b_t is the constant retention ratio after year 15. Given the first two years' forecast earnings (FE), the initial growth rate (g_{t+2}) is given by: $g_{t+2} = \frac{FE_{t+2}}{FE_{t+1}} - 1$. This implies that $g_{t+2} \exp\{g_t^g \times 15\} = g_t$ with g_t^g being the growth rate of growth rate g_{t+2}, which yields $g_t^g = \ln\left(\frac{g_t}{g_{t+2}}\right)/15$. Now we can construct FE_{t+k} for the next 15 years as $FE_{t+k} = FE_{t+2} \times (1 + g_{t+2} \exp\{g_t^g \times (k-2)\})$ for $3 \leq k \leq 16$.

The retention rate is assumed to revert linearly to the constant rate $b_t = \frac{g_t}{ICC_t}$ by year 16. Thus, we have $b_{t+k} = b_{t+1} - \frac{(b_{t+1} - \frac{g_t}{ICC_t})}{15} \times (k-1)$ for $2 \leq k \leq 16$. The initial retention ratio is estimated as $b_{t+1} = [1 - \text{Cash Dividend}_t \,/\text{Net Income}_t]$.

Now we construct the stream of dividends as $D_{t+k} = FE_{t+k} \times (1 - b_{t+k})$ for $1 \leq k \leq 15$. For the terminal value of remaining cash dividends after year 15, we have: $FE_{t+16} \times (1-b_t)/(ICC_t - g_t)$. Putting all terms together, we estimate *ICC-LNS* from the following equation:

$$P_t = \sum_{k=1}^{15} \frac{FE_{t+k} \times [1 - b_{t+1} + \frac{(b_{t+1} - \frac{g_t}{ICC_t})}{15} \times (k-1)]}{(1 + ICC_t)^k} + \frac{FE_{t+15} \times (1 - b_t)}{(ICC_t - g_t)(1 + ICC_t)^{15}}. \quad (11)$$

This equation is equivalent to Eq.(4) in Li, Ng, and Swaminathan (2013).

We consider an alternative model following the Easton (2004) approach. For this, we can the stock price P_t as the sum of capitalized expected earnings and expected abnormal growth in accounting earnings:

$$P_t = eps_1/r + r^{-1} \sum_{t=1}^{\infty} (1+r)^{-1} agr_t \quad (12)$$

If earning forecasts are available for two periods, then the Eq.(12) can be reduced to:

$$P_0 = eps_1/r + agr_1/\left(r\left(r - \Delta agr\right)\right) \tag{13}$$

where $\Delta agr = (agr_{t+1}/agr_t) - 1$.

In the special case $\Delta agr = 0$, Eq.(13) can be written as:

$$P_0 = \left[eps_2 + rdps_2 - eps_1\right]/r^2 \tag{14}$$

and $r = \sqrt{\left(eps_2 + rdps_1 - eps_1\right)/P_0}$. The expected return, which is called the modified PEG ratio in Easton (2004), is denoted as *LCC-EAS* in our paper.

As the last approach, we follow the Gebhardt, Lee, and Swaminathan (2001) and estimate *ICC-GLS* as follows:

$$P_t = BE_t + \sum_{k=1}^{12} \frac{(ROE_{t+k} - ICC_t)BE_{t+k-1}}{(1+ICC_t)^k} + \frac{(ROE_{t+12} - ICC_t)BE_{t+11}}{ICC_t(1+ICC_t)^{12}} \tag{15}$$

where ROE_{t+k} is the return on equity at $t+k$ which is assumed to fade linearly to the industry median ROE (based on 10 years of past data for 48 Fama and French industries, excluding firms with losses) by year $t+12$. The book value of equity is given by $BE_{t+k} = BE_{t+k-1} + FE_{t+k} \times (1 - b_{t+k})$.

The sample includes firms with I/B/E/S earnings forecasts for up to five years and a long-term growth forecast. We also require non-missing data for the prior year's book value of equity and earnings. When explicit forecasts are unavailable, we obtain forecasts by projecting the long-term growth rate on the prior year's earnings forecast.