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CEO mobility and corporate policy risk<sup>☆</sup>Gönül Çolak<sup>a,\*</sup>, Timo Korkeamäki<sup>b</sup><sup>a</sup> Hanken School of Economics, 00101 Helsinki, Finland<sup>b</sup> Aalto University, School of Business, FI-00076 Aalto, Finland

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## ABSTRACT

Career concerns can limit a manager's willingness to take risks, which can lead to excessive policy conservatism. An increase in a CEO's ability and willingness to change jobs (CEO mobility) can diversify her human capital and reduce her conservatism. We derive several CEO mobility measures and relate them to a policy riskiness index that captures the overall risk embedded in a firm's corporate policies. We find a strong positive relation between CEO mobility and the riskiness of corporate policies. We also link external regulatory shocks that constrain labor mobility to significant drops in corporate risk-taking.

## 1. Introduction

CEOs tend to suffer sizeable human capital devaluations upon job loss (Agrawal and Walkling, 1994; Fee and Hadlock, 2004; Eckbo et al., 2016), which makes managerial career concerns a major problem for corporations. Career concerns can reduce a CEO's willingness to take risks, as managers with limited outside employment options (immobile CEOs) seek to safeguard their current positions (Jensen and Meckling, 1976; Gervais et al., 2011). With the risk aversion of immobile CEOs, potential agency problems arise, because limited outside opportunities may induce managers to act more conservatively than what would be optimal for their firms' shareholders (Fama, 1980). Outside labor market opportunities (i.e., CEO outside option), on the other hand, align CEO incentives with those of the shareholders (Holmström, 1982). Therefore, any constraints to the functioning of the outside labor market are likely to affect CEO behavior. While the concept of CEO's outside option is widely used, surprisingly few comprehensive and direct empirical measures of it exist.

Prior support for the connection between CEO mobility and risk-taking includes survey evidence by Graham et al. (2005), who suggest that the external market for managerial talent has a powerful effect on shaping executive decisions. Also, Custodio et al. (2019) report a positive relation between CEO outside options and the level of innovation. Managers who are insulated from outside labor

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markets, on the other hand, seem to avoid risky policies; Low (2009) and Gormley and Matsa (2016) report that states' adoption of antitakeover laws leads to excessive conservatism in acquisition decisions.

To identify the causal relationship between CEO mobility and corporate policy risk, we utilize the special cases where various legal restrictions on labor mobility are exogenously imposed on the local firms. First, we consider amendments of the non-compete agreements in certain states. Those amendments changed the enforceability of the non-compete rules substantially, and they had a significant effect on labor mobility (Ewens and Marx, 2018; Jeffers, 2018; Kini et al., 2020). Second, we use the staggered recognition of the Inevitable Disclosure Doctrine, which restricts employee mobility to protect firms' trade secrets (Klasa et al., 2018). Our findings, using these state-level exogenous shocks, suggest that legal restrictions on labor mobility are associated with increased policy conservatism.

While mobility-related staggered law changes provide state-level evidence of causality between mobility and risk-taking, we further develop several CEO-specific measures of mobility that can more directly approximate Holmström's (1982) "outside option" concept at the individual level. This allows us to study whether correlation between mobility and risk-taking also holds when we include a rich set of firm-level covariates in our analysis. While theoretically very intuitive, the extant literature lacks a reliable empirical proxy of the outside option concept for a given CEO at a given point in time. The CEO turnover cases fail to capture this outside option, as vast majority of them involve involuntary turnovers instigated by poor performance, mergers, or retirement (Jenter and Kanaan, 2015). Cziraki and Groen-Xu (2019) indicate that increased threat of involuntary turnover, in form of an expiring CEO job contract, curbs risk-taking. Campbell et al. (2011) find that CEOs who deviate in their optimism from the interior optimum face higher threat of forced turnover. We differ from this prior literature, as we focus on the voluntary aspect of the CEO job-hopping probability. Our mobility measures are based on a large number of factors that are reported to affect a CEO's ability and willingness to change jobs. They should, thus capture the outside option concept of Holmström (1982) better than the measures that are based only on CEO turnover events.

Our first CEO-specific measure of mobility relies on observed cases in which a CEO engages in a horizontal job change. Following Parrino (1997) and Ryan and Wang (2016), we treat such cases as voluntary turnovers. The mobility is estimated with a probit model that controls for such CEO characteristics as ability, tenure, age, current pay, interlocking board memberships, and number of past job changes. Our second measure identifies 14 different variables (see Appendix A) that previous studies report as important determinants of CEOs' employment choices. Using this large set of variables, we conduct a principal component analysis to extract the main driver of mobility. Our third measure of mobility is actually an immobility measure. It assumes that a CEO who recently assumed her position is neither willing nor able to make a switch to another company during the first few years of her tenure. This is consistent with the notion that it takes time for newly appointed CEOs to demonstrate their capabilities (Gibbons and Murphy, 1992), and that managerial short termism becomes a problem in the latter parts of manager's tenure (Prendergast and Stole, 1996; Edmans et al., 2012).

Corporate policy risk is typically measured using one-dimensional metrics related to investment policy, leverage, acquisition activity (i.e., business diversification), or the volatility of various accounting variables.<sup>1</sup> These metrics allow direct observation of changes in different dimensions of corporate risk-taking. However, our focus is on the overall risk appetite of the firm, while recognizing that individual risk characteristics such as business risk and financial risk are often negatively correlated at the firm level. We thus construct an overall *Policy Riskiness Index (PRI)* that essentially estimates the total policy risk entailed in major firm policies, and reduces the various policy decisions a CEO makes into one single quantifiable measure. The estimation of the *PRI* is based on a regression analysis relating a firm's current policy choices to its future realized risks, as measured by a firm's future stock volatility, future idiosyncratic volatility, and the future volatility of its accounting variables. The key advantage of this approach is that various corporate policies can be assessed as to their contribution to overall realized risk and hence weighted properly when constructing a policy riskiness index. While *PRI* is our main measure of corporate policy risk, we also report results based on individual risk characteristics in order to provide comparability with prior findings.

We find a strong relation between CEO-specific mobility and our policy riskiness index (*PRI*). A one standard deviation increase in the CEO-level mobility measure(s) is associated with an increase of up to 0.07\*(standard deviation) in *PRI*. When we follow prior studies, such as Coles et al. (2006), and analyze corporate policies separately, we find that the majority of risk taking by the mobile CEOs takes place through investment and business diversification policies. Furthermore, consistent with Giannetti (2011), we observe a nonlinear (inverse-U shaped) relationship between policy risk and mobility, where at very low (high) levels of mobility, the risk-mobility relationship is positive (negative).

Social capital of the CEO plays a role in CEO mobility. While mobility is a wider concept as it embeds both ability and willingness of the CEO to switch employment, social capital facilitates CEO's ability to change job. Through social networks, the CEO can both transmit and receive information relevant to her labor market standing, and thus expand her outside options. We analyze the role of low CEO social capital in exacerbating policy conservatism. An increase in CEO mobility has significant impact on risk taking only in low social capital subsamples, where CEO's policy conservatism is expected to be more severe (Faleye et al., 2014; Ferris, Javakhadze, and Rajkovic, 2017). Finally, our analyses indicate that CEO mobility has a positive wealth effect for shareholders (measured by

<sup>1</sup> While Coles et al. (2006) use R&D, leverage, and number of segments as measures of corporate policy risk, Faccio et al. (2011) and Dittmar and Duchin (2016) use standard deviation of ROE.

Tobin's  $q$  or ROA). Its economic impact on Tobin's  $q$  is similar in magnitude to the impact exerted by firm acquisitions.

Our findings have important implications. We provide robust new evidence consistent with Holmström's (1982) argument that career concerns and lack of outside options limit a CEO's propensity to take policy risks. Thus, encouraging CEO labor mobility to increase from its current meager levels<sup>2</sup> can serve as a non-contractual solution to the excessive policy conservatism (Hirshleifer and Thakor, 1992). This is a relevant point for corporate boards to consider.

## 2. CEO outside option and the related literature

The seminal study by Holmström (1982) claims that outside job opportunities of a CEO affect her effort and choices within the firm. The early work by Bertrand and Shoar (2003) empirically demonstrates that CEO fixed effects (managerial style) play a significant role in shaping a wide range of firm policies, but they leave unclear the issue of whether a CEO's outside option is a major or a tangential component of a CEO's style. A more recent study by Fee et al. (2013) asserts that managerial style effects are unobservable around exogenous CEO turnovers, but according to Dittmar and Duchin (2016), such managerial effects do exist, and they are mostly confined to the endogenous turnover cases. Thus, the issue of whether CEO outside option (ability and willingness to voluntarily change jobs) is instrumental in shaping the corporate policies remains unresolved empirically.

Many elements of managerial style (individual's personal characteristics) have a documented effect on corporate outcomes; among those, are CEO's age and education (Bertrand and Shoar, 2003; Yim, 2013; Serfling, 2014), CEO's ability (Chang et al., 2010; Demerjian et al., 2012; Custodio et al., 2013), CEO's past employment history (Ryan and Wang, 2016; Custodio and Metzger, 2014; Dittmar and Duchin, 2016), CEO's life experiences (Malmendier et al., 2011; Bernile et al., 2017; Yonker, 2017), CEO tenure (Benson and Davidson III, 2009). We contribute to this literature by reporting that CEO mobility, arising from personal, firm, industry, and market attributes, has a significant effect on corporate policies.

Very few studies have attempted to approximate a CEO's outside option with an empirical measure that varies over time and across CEOs.<sup>3</sup> The difficulties in creating such a CEO-specific mobility proxy lie with the large number of factors that can potentially affect a person's ability and willingness to engage in horizontal job hopping. The aforementioned personal characteristics of the manager (i.e., elements of managerial style) are naturally expected to affect a CEO's mobility,<sup>4</sup> but so are other factors such as various industry characteristics (Cremers and Grinstein, 2013; Gao et al., 2015), local labor laws (Chen et al., 2018; Ewens and Marx, 2018; Jeffers, 2018; Klasa et al., 2018), the demographics of their current location (Deng and Gao, 2013; Francis et al., 2016), and the supply and demand forces within the CEO labor market (Parrino, 1997). The relation between CEO mobility and managerial labor market is a complex one, as behaviors of both the firm and the CEO are likely to be affected by the supply of and the demand for the managerial talent. Parrino (1997) reports that a deeper pool of potential replacements reduces the cost of CEO turnover, thus increasing its likelihood. Liu (2014) indicates that both the supply of potential CEO candidates, and the outside opportunities for the current CEO play a role in CEO turnover. Our proxies for managerial mobility incorporate all of the above factors, in an attempt to comprehensively and directly measure a CEO's outside option. We also instrument for the size of the potential replacement market of a CEO (supply of CEO talent) and for the ongoing CEO job vacancies in a given year (demand for CEO talent).

By design, our mobility proxies aim to capture the external job options of a CEO, regardless of why that CEO wants to cash these options. As such, our mobility measures reflect both the *ability* of a CEO to find a new job if and when she is pushed out for taking risky projects (ability to pivot) and the *willingness* of that CEO to accept another more attractive CEO position (voluntary job-hopping). Thus, the mechanism that establishes the link between mobility and risk-taking is built on both the ability to pivot and the willingness to engage in voluntary job-hopping.

## 3. Data, sample, and variables

We employ two datasets, one to estimate CEO mobility, and another one to measure policy riskiness. In this section, we describe the two data sets, along with a discussion of our sample selection and construction of various measures that we use in this study.<sup>5</sup> Detailed

<sup>2</sup> Several studies report that the current levels of labor mobility within the CEO markets are very low. Cziraki and Jenter (2020) find that only 3% of the new CEOs are recruited directly among the CEOs of other firms. Gibbons and Murphy (1992) estimate that only about 2.2% of their sample of departing CEOs take another CEO position at other firms. Fee et al. (2018) report that only around 4% of CEOs that are separated from their firm get comparable or better jobs at another public firm.

<sup>3</sup> Exceptions include studies by Ryan and Wang (2016), who approximate CEO mobility as the past job experiences of a manager, and Liu (2014), who reports that social network centrality of the CEO has a positive effect on CEO turnover. A recent work by Kale et al. (2019) approximates the outside option of the firm employees, in general, by using industry level unemployment statistics.

<sup>4</sup> Prior work has approximated career concerns using CEO age and tenure to study its effect on earnings manipulation (Ali and Zhang, 2015), stock crash risk (Andreou et al., 2017), and restructuring activity (Serfling, 2014; Li et al., 2017). As explained below, our outside option (or CEO Mobility) measures utilize age and tenure together with twelve other such variables.

<sup>5</sup> Note that when constructing our Policy Riskiness Index (PRI) we use a larger sample of 66,947 observations to reliably estimate the index parameters that are used to determine the relative importance of the four policy components forming our PRI variable (see Section 4). Similarly, for two of our mobility measures (Predicted Mobility from probit regression and our PC Mobility from our principal component analysis) we use the larger sample of 26,196 observations during the estimation (see Section 6). However, it is important to note that when we use the same sample of 19,761 observations to estimate the parameters of PRI, Predicted Mobility, and PC Mobility, and to run our mobility-risk regressions (see Section 7), our qualitative conclusions are unchanged.

definitions of all the variables can be found in Appendix A.

### 3.1. Data and sample used in policy risk analyses

Our analysis on the riskiness of firms' corporate policies utilizes several data sources. We use both annual and quarterly accounting data from Compustat for the period between 1993Q1 and 2011Q4. We retrieve monthly dividend-adjusted stock returns from CRSP, along with the CRSP equally-weighted market returns. In calculation of stocks' idiosyncratic risk, we rely on the Fama-French-Carhart four factor model, which we estimate using monthly data. The corresponding risk factors are obtained from Kenneth French's website. Our stock return analysis includes only firms with at least 12 months of available stock price data. Our policy riskiness analysis is based on a final sample of 66,947 firm-years, corresponding to 8431 distinct firms.

### 3.2. Data and sample used in CEO mobility analysis

Our data on CEO characteristics come from ExecuComp, and the source for our firm and industry characteristics is Compustat's annual files. To locate the firm's Metropolitan Statistical Area (MSA), we map the ZIP code of the firm's headquarters to the corresponding MSA with data from the United States Census Bureau. Finally, to determine which CEOs engaged in a horizontal move from one CEO position to another, we manually check (by reading the related news articles) the circumstances surrounding each horizontal move of a CEO, as indicated by ExecuComp. Since leverage is a key variable in our analyses and to be consistent with the prior literature (e.g., Coles et al., 2006), we drop financial firms and utilities from our sample.<sup>6</sup> The final sample used in mobility analyses contains 26,196 firm-years, corresponding to 5134 distinct CEOs and 2575 distinct firms between 1993 and 2011.<sup>7</sup> We end our mobility sample in 2011 to be able to calculate the 3-year ex-post realized risk measures that are used in constructing our policy riskiness index.

The combined sample created by matching the firm risk sample with the mobility sample (using GVKEY and year) has 72,132 firm-year observations, of which only 21,011 firm-years are present in both of these samples. To remain in our final sample, we further require that all the mobility measures and control variables have non-missing observations. This yields a sample of 19,761 observations. In our analyses of mobility-risk relationship we rely on this final risk-mobility sample. For summary statistics of this sample, please see Online Appendix (Table A1). For basic descriptive statistics of all the variables used in the study, please see Appendix A.

## 4. Policy riskiness index (PRI)

Prior studies on corporate risk-taking, such as Coles et al. (2006) and Faccio et al. (2011), tend to consider riskiness of individual corporate policies. As an alternative, changes in corporate policy risk is sometimes deduced from measures on stock return volatility (Low, 2009; Cain and McKeon, 2016). Analyzing individual policies or financial risk measures can be useful as it may shed light on the relevance of different dimensions of risk. However, observation of individual policies can be a noisy method, as corporate policies are often designed with the overall corporate risk in mind, so that for instance firms with high business risk choose a lower level of financial risk. We are not aware of any widely accepted empirical methodology for measuring the combined riskiness of the major corporate policies. Therefore, we construct our own *Policy Riskiness Index (PRI)* by implementing a procedure that decomposes a firm's current materialized risk into its policy components (*policy decomposition of firm risk*). This decomposition, essentially, assumes that the current observed risk level of a firm is a function of i) past corporate policy decisions made by management, ii) certain industry and macroeconomic shocks, and iii) some idiosyncratic disturbances. We estimate the relative weight of each source of risk.<sup>8</sup> Implementation of this decomposition requires proxies for firm's materialized risk, determining the set of corporate policies generating this risk, a way to control for industry and macroeconomic shocks, and a method of estimating the relative weights of these sources of risk. Next, we focus on these tasks.

### 4.1. The policy components

Our PRI variable combines the central policy decisions of the firm; namely, investment decisions, capital structure policy, business diversification choice, and cash policy. Among the most important managerial policy decisions is the capital budgeting decision. Such long-term investments are reflected in firms' as capital expenditures (CAPX) and research and development spending (RND). Accounting literature tends to consider RND expenditures as risky investments because of the uncertainty about the materialization of future cash flows (Bhagat and Welch, 1995; Kothari et al., 2002). Capital expenditures are less risky, as they involve investments with more predictable and more tangible cash flows. Building on such arguments, Coles et al. (2006) posit that firms that invest more in RND relative to CAPX follow riskier investment policies. We adopt their intuition and approximate a firm's investment policy riskiness

<sup>6</sup> These firms carry substantially different levels of debt in their books and are heavily regulated by financial authorities and/or local states governments, and thus they cannot freely implement risky policies.

<sup>7</sup> The 2007–2008 crisis had a profound impact on CEOs' mobility and their related risk-taking incentives. In a robustness test we remove these years and rerun our main tests. Our qualitative conclusions remain the same.

<sup>8</sup> The obvious shortcoming of our PRI measure is that as an econometric construct, it may appear as a “black box” and thus difficult to interpret. In order to both alleviate the “black box” concern, and allow comparisons with prior findings, we provide also results where different corporate policies are analyzed separately.



with the ratio of RND over CAPX in a given year  $t$  ( $Investment\ Policy_{i,t} \equiv \log(1 + RND_{i,t} / CAPX_{i,t})$ ). The logarithmic transformation reduces the high skewness of the RND/CAPX ratio.<sup>9</sup>

Another corporate policy with a strong impact on a firm's future cash flows is its financial policy or its capital structure choice. A CEO's attitude towards risk can be inferred from the overall level of debt she is willing to carry on the firm's balance sheet, as prior literature suggests a strong link between the CEO's attitude towards indebtedness and leverage of her firm (Cronqvist et al., 2012; Korkeamäki et al., 2017). Coles et al. (2006) suggest that higher firm leverage is indicative of a CEO's desire for higher financial risk. We thus approximate a CEO's financial risk tolerance by the total leverage of her firm ( $Capital\ Structure\ Policy_{i,t} \equiv Total\ Debt_{i,t} / Total\ Assets_{i,t}$ ).<sup>10</sup>

A firm's diversification into multiple industries can reduce its future cash flow volatility. Thus, ceteris paribus, a risk-averse CEO is more likely to operate in a higher number of business segments (see, among others, Amihud and Lev, 1981; Comment and Jarrell, 1995). Hence, the logarithm of a firm's number of different business segments captures the risk associated with running a highly focused business ( $Business\ Diversification\ Policy_{i,t} \equiv \log SEGN_{i,t}$ ).<sup>11</sup>

Prior literature emphasizes the importance of the above three policies (Coles et al., 2006; Faccio et al., 2011). We add a fourth one to this list: the firm's excess cash holdings policy (measured as in Opler et al. (1999)). By construction, it encompasses information from several other policies, which are closely interrelated to firm's cash policy. As shown in Appendix A, our measure of a firm's excess cash ( $Cash\ Policy_{i,t} \equiv XCash_{i,t}$ ) captures information about the firm's dividend policy, long-term financing (leverage) policy, short-term financing policy (Net Working Capital), and current cash flows. A firm's excess cash policy (or liquidity policy) is thus included in our analyses for completeness, as it reflects the consequences of many other policy decisions.<sup>12</sup>

#### 4.2. Ex-post realization of risk

To assess the riskiness of the current firm policies, we use various ex-post measures of realized risk during the 3 years (or alternatively 1 year or 5 years) after a policy is put into effect. We postulate that whatever policy risk a CEO takes will take effect in the subsequent years, and thus it will reflect itself in our ex-post risk measures.

The first realized risk variable is the standard deviation of the firm's quarterly cash flows that materialize during the next 12 quarters following the observation of policy metrics. This variable is denoted by *StDev of CFs*. We also calculate the industry-adjusted version of the cash flows, and their standard deviation, denoted by *Ind-Adj CFs*. Studies, such as Minton and Schrand (1999), suggest that higher cash flow volatility is an indication of firm risk that is reflected in external financing costs. We also use the standard deviation of quarterly ROAs of the firm during the future 12 quarters, or *StDev of ROA*. The industry adjusted version of this variable is *Ind-Adj ROA*. This type of a measure is used by Faccio et al. (2011) and Li et al. (2013).

We also create two market-based measures of realized risk that utilize firms' monthly stock returns. The first measure is the standard deviation of the stock's abnormal return (AR) over a period of 36 months, and it is denoted as *StDev of Returns*. Our second market-based measure of realized risk is the idiosyncratic volatility of the stock over the next 36 months (*Idios. Volatility*). According to Cao et al. (2008) and Ferris et al. (2017), managerial risk-taking is likely to be reflected in a firm's idiosyncratic risk. We follow Ang et al. (2009), and define idiosyncratic volatility as the standard deviation of the residuals from the four-factor Fama-French-Carhart model over the 36 months period. In un-tabulated tests, we find that these six realized risk measures are significantly positively correlated at the 1% significance level. It is thus quite likely that they capture the same economic concept (realized corporate risk). Further details on these measures are provided in Appendix A.

#### 4.3. Constructing the policy riskiness index

To construct a broad index that captures the total riskiness of observed corporate policies, we need to estimate the relative weight of each source of policy risk. We refer to this estimation as *policy decomposition* of the firm's realized risk. We empirically estimate these weights by regressing our ex-post realized risk measures on the policy variables. Industry (FF48) and time fixed effects are utilized to remove the industry-specific and economy-wide factors that affect the realized risk of a firm. Knowing the relative weights of each policy component helps us create a unified policy riskiness index that can be used to measure a CEO's tolerance of policy risk. This type of indices are often used in the context of the firm's financial constraints (see Kaplan and Zingales, 1997; Whited and Wu, 2006). The literature on managerial risk taking, on the other hand, typically employs various individual proxy variables, that each capture separate dimensions of firm's overall policy risk.

<sup>9</sup> It should be noted that Chen et al. (2015) study reports that a CEO under threat of involuntary turnover may manipulate earnings by reducing R&D expenses, while capital expenditures are immune to such behavior as they do not affect earnings. Thus, the RND/CAPX ratio should correlate positively only with the possibility of voluntary turnover, while threat of involuntary turnover may have an inverse effect on RND/CAPX.

<sup>10</sup> Using net leverage ( $=(Total\ Debt - Cash) / Total\ Assets$ ) does not qualitatively affect our main conclusions.

<sup>11</sup> Alternatively, we have considered  $Acquisitions_{i,t} / Total\ Assets_{i,t}$  as our measure for a CEO's desire to change the business structure of the company. The acquisition-based risk measure yields inferences that are similar to those we report.

<sup>12</sup> Using a firm's overall level of cash holdings (cash-to-assets) as in Bernile et al. (2017) does not qualitatively change our conclusions. Our results are also robust to removing cash holdings from the risk estimation. Based on Opler et al.'s (1999) construct, *XCash* measure has the additional advantage of directly reflecting a firm's dividend and short-term financing policies and thus, we use it as a proxy for a firm's cash policies. See Appendix A for details on how *XCash* is constructed.

In short, we create our policy riskiness index (*PRI*) with help of the following regression:

$$\begin{aligned} \text{Realized Risk}_{i,t+36} = & \beta_0 + \beta_1 \text{Investment Policy}_{i,t} + \beta_2 \text{Capital Structure Policy}_{i,t} + \beta_3 \text{Business Diversification Policy}_{i,t} \\ & + \beta_4 \text{Cash Policy}_{i,t} + \sum_j \gamma_j \text{Ind}_j + \sum_n \theta_n \text{Year}_n + \varepsilon_{i,t} \end{aligned} \quad (1)$$

This regression decomposes a firm's realized risk measure into three main components. The first is the risk created by various industry characteristics. In the above regression this component is captured by the industry fixed effects dummies,  $\sum_j \gamma_j \text{Ind}_j$ .<sup>13</sup> The second component is the time-varying realized risk that might occur due to various macroeconomic and technological shocks. This component is captured by the time fixed effects dummies,  $\sum_n \theta_n \text{Year}_n$ . The third component, on which we focus, is the risk originating from four different corporate policies—investment, capital structure, business diversification, and excess cash policies. This component highlights the advantage of using such a decomposition technique over the traditional firm volatility measures, such as volatility of stock returns or idiosyncratic volatility. Our measure of corporate policy riskiness (*PRI*) captures mostly the elements of risk that are induced by a CEO, isolated from any exogenous and idiosyncratic drivers of this materialized firm risk. As we report later on, use of volatility measures (such as *StDev of Returns*, *StDev of ROA*, and *Idios. Volatility*) instead of *PRI* yields consistent conclusions of a positive relationship between policy riskiness and CEO mobility. In our Online Appendix we report these alternative results (see Table A2). Those results also serve as a form of “construct validity” for our *PRI* measure, where riskiness of corporate policies is measured directly with stock's volatility.

In Table 1, we present the estimated policy coefficients for various ex-post realized risk measures. Since our goal is to isolate the realized risk created *only* by a CEO's policy decisions, we define our policy riskiness index (*PRI*) as the predicted value using only the coefficients of the firm-specific policy variables,  $\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3, \hat{\beta}_4$ .  $\text{PRI}_{i,t}$  of firm *i* at year *t* is formally created as:

$$\begin{aligned} \text{PRI}_{i,t} = & \hat{\beta}_0 + \hat{\beta}_1 \text{Investment Policy}_{i,t} + \hat{\beta}_2 \text{Capital Structure Policy}_{i,t} + \hat{\beta}_3 \text{Business Diversification Policy}_{i,t} + \hat{\beta}_4 \text{Cash Policy}_{i,t} \\ = & 0.0676 + 0.0115 \text{Investment Policy}_{i,t} + 0.0255 \text{Capital Structure Policy}_{i,t} - 0.0125 \text{Business Diversification Policy}_{i,t} \\ & - 0.0020 \text{Cash Policy}_{i,t} \end{aligned} \quad (2)$$

The weights are from column (1), where the standard deviation of future cash flows serves as the dependent variable. This is the main specification that we use to create *PRI*, and it shows robustness to using firm fixed effects or industry-year fixed effects, as well (see columns (7) and (8)).<sup>14</sup> One can observe in Table 1 that the signs and significance levels of the coefficients for different policies are fairly consistent across different risk measures, with the possible exception of the *Cash Policy*<sub>*i,t*</sub> variable. More importantly, the main results we report in this paper are robust to using the coefficient values in any of the columns in Table 1 to define *PRI* (see Online Appendix, Table A3 for the results with these alternative *PRI* constructions).

Various macroeconomic and/or industry-wide shocks can force all firms to adjust the riskiness of their policies. By removing the industry-specific and macroeconomic shocks embedded in each of the above-mentioned individually realized risk measures, our *PRI* measure focuses only on the risks for which the firm's own actions are responsible. Since our goal is to isolate risks that originate from a CEO's own decisions, we believe that constructing a measure that removes industry specific and macroeconomic shocks is critical to our study. The ability to capture the total or combined risk present in all of the policy decisions of a CEO—isolated from various industry and macroeconomic noise—is an important advantage of our *PRI* measure.

R&D plays an important role in the construction of our risk index (*PRI*). Unfortunately, R&D expenses are missing for a large number of Compustat firms. In Table 1 regressions, we have replaced missing values with zeros. In an alternative setting, however, we drop those observations. While this causes our sample size to shrink by about 50%, the main conclusions of the paper remain largely intact. Finally, in all of our analyses that follow, we use the standardized version of this index in order to facilitate the interpretation of the regression coefficients.

#### 4.4. Benefits and potential caveats of the *PRI* measure

As we note above, we develop the *PRI* in order to capture the multi-faceted concept of corporate policy riskiness in a single measure. This approach has some analytical advantages and some potential caveats. In contrast to merely focusing on one dimension of the CEO's actions (e.g., capital structure), we construct a comprehensive measure which allows us to establish the total riskiness of major corporate policies. Akin to the well-known weighted average cost of capital (WACC), which summarizes the total financing costs of a firm, our *PRI* measure summarizes the total weighted risk generated by CEO's decision making. Also, different dimensions of corporate risk-taking often counter (or hedge) each other by managerial design, which implies lower combined policy riskiness. A single measure of risk would miss such cross-policy hedging.

Furthermore, in contrast to merely observing stock return (or idiosyncratic) volatility, our *PRI* metric has another advantage: it ties

<sup>13</sup> Note that, we also apply industry-year interacted fixed effects (see Table 1). Such interacted fixed effects capture time-varying industry shocks.

<sup>14</sup> A firm's Capital Structure Policy (i.e., leverage) and Business Diversification Policy (i.e., *lnSEGN*) show certain persistence over time within a given firm (see Lemmon et al., 2008), and in such cases suppressing firm fixed effects while constructing *PRI* may be suboptimal. However, the qualitative conclusions of this paper are unchanged when *PRI* is stripped from firm fixed effects together with industry and year fixed effects.

**Table 1**  
Components of policy riskiness index.

VARIABLES	(1) StDev of CFs 12qtrs	(2) StDev Returns 36 months	(3) StDev of ROA 12qtrs	(4) Idios. Volatility 36 months	(5) Ind-Adj. CFs 12qtrs	(6) Ind-Adj ROA 12qtrs	(7) StDev of CFs 12qtrs	(8) StDev of CFs 12qtrs
Investment Policy	0.0115*** [0.000]	0.0283*** [0.000]	0.0234*** [0.000]	0.0268*** [0.000]	0.0185* [0.100]	0.0276** [0.021]	0.0123*** [0.000]	0.0050** [0.029]
Capital Structure Policy	0.0255*** [0.005]	0.0416*** [0.000]	0.0218*** [0.000]	0.0389*** [0.000]	0.1403* [0.053]	0.1463** [0.048]	0.0262*** [0.004]	0.0230* [0.056]
Business Diversification Policy	−0.0125*** [0.000]	−0.0230*** [0.000]	−0.0075*** [0.000]	−0.0216*** [0.000]	−0.0275** [0.015]	−0.0235** [0.025]	−0.0127*** [0.000]	−0.0003 [0.923]
Cash Policy	−0.0020** [0.040]	−0.0006 [0.698]	−0.0006 [0.437]	−0.0020 [0.156]	—	—	−0.0021*** [0.008]	−0.0024** [0.038]
Constant	0.0676*** [0.000]	0.1105*** [0.000]	0.0285*** [0.000]	0.1057*** [0.000]	0.0351* [0.084]	−0.0199 [0.356]	0.0626*** [0.000]	0.0361*** [0.000]
Observations	47,047	47,040	47,048	46,937	60,031	60,034	47,047	47,047
R-squared	0.025	0.064	0.033	0.050	0.006	0.007	0.050	0.550
Industry F.E.	YES	YES	YES	YES	NO	NO	NO	NO
Year F.E.	YES	YES	YES	YES	YES	YES	NO	YES
Industry-Year F.E.	NO	NO	NO	NO	NO	NO	YES	NO
Firm F.E.	NO	NO	NO	NO	NO	NO	NO	YES

The table displays the estimation results from regressing the realized ex-post risk measures on the current policy riskiness measures. Ex-post risk measures are (1) the standard deviation of firm's quarterly cash flows for the next 12 quarters; (2) the standard deviation of firm's quarterly ROA for the next 12 quarters; (3) the standard deviation of the stock's monthly returns over the next 36 months; (4) the idiosyncratic volatility calculated using as the standard deviation of stock's error terms from the Fama-French-Carhart 4-factor model estimated using monthly stock return data. Industry fixed effects are used to isolate away the industry-specific shock on the realized volatility (using FF48 industries). The year fixed effect removes the time varying changes in all the stocks' realized risk (e.g., during recessions, high political uncertainty periods, and so on). For robustness, in columns (7, 8) we also utilize, respectively, industry-year fixed effects and firm fixed effects in our main regression specification (the one that uses *StDev of CFs* as ex-post risk measure). The regressions in columns (5, 6) use the industry-adjusted versions of the quarterly cash flows and ROA (by subtracting the industry medians of cash flows and ROA from each observation) when calculating the standard deviation. These two regressions exclude our cash policy variable (captured by the excess cash variable, which is measured as the residual value from cash regressions as in [Opler et al. \(1999\)](#)), because that policy variable is calculated using industry fixed effects (see the Appendix). The standard errors are calculated using clustering at industry level and p-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

volatility to the specific corporate actions and their weighted average effects on the overall corporate risk. PRI allows data to determine what weights are appropriate for each risk dimension. Knowing the relative weights of each source of risk helps us create a comprehensive policy riskiness index.

Finally, this type of weighted indices are often used to capture the firm's financial constraints (see [Kaplan and Zingales, 1997](#); [Whited and Wu, 2006](#)) or in the context of bankruptcy probabilities ([Altman's \(1968\)](#) Z-score). For example, instead of focusing on one measure of financing distress (e.g., solvency), the Altman's Z score utilizes information from many dimensions (the formula takes into account profitability, leverage, liquidity, solvency, and activity ratios, and applies a weighing scheme to each variable).

The PRI also has some potential caveats that are worth mentioning. First, as an econometric construct, the PRI by itself may appear as a “black box” to a manager. While it provides an indication on the relative weight that each of the included risk dimensions have on the overall corporate policy risk, the PRI value could be difficult to interpret by the managers. Second, a regression-based index is dependent on the assumptions of linear regression. For instance, [Hadlock and Pierce \(2010\)](#) criticize the widely-used index on financial constraints by Kaplan and Zingales (KZ)(1997) for including the same (qualitative) information in the independent variables as well as in their dependent variable. [Hadlock and Pierce \(2010\)](#) further provide evidence of potentially misleading inferences arising from this index. This second concern is not as pressing in our case, as we relate the observable factors of corporate risk-taking to market-based volatility metrics, and thus avoid mechanical linkages between the dependent and independent variables that we use in the estimation of the PRI.

In light of these potential caveats, we also report the relations between CEO mobility and corporate policy risk in a more traditional format in [Table 6](#), where we consider individual policies on investment, diversification, capital structure, and excess cash separately. Similarly, in our Online Appendix (Table A2), we report results whereby, instead of PRI, we use various stock, cash flow, and ROA volatilities as measures of risk.

## 5. Relationship between CEO mobility and policy risk: external shocks to mobility

Next, we test our main hypothesis that a CEO's willingness and ability to change jobs affects her decision making. We conduct several analyses to gain understanding of these relationships. For brevity, we shall refer to these analyses as *risk-mobility regressions*. We begin this section by implementing risk-mobility regressions using state-level law changes as exogenous legal shocks to CEO mobility. In latter sections, we create firm-level CEO mobility measures and relate them to our policy risk measure (*PRI*).



### 5.1. Changes in states' non-compete laws

Our first analysis focuses on the states where the enforceability of employee non-compete agreements has changed in a staggered fashion over time (Ewens and Marx, 2018; Chen et al., 2018). Such amendments of non-compete enforceability laws could plausibly serve as exogenous shocks to the inter-organizational mobility of a CEO. Jeffers (2018) reports that changes in enforceability of non-compete clauses have an economically significant effect on labor mobility, especially among knowledge-sensitive occupations. While a number of prior studies consider enforceability of non-compete contracts as an exogenous shock to labor mobility, Garmaise (2011) and Kini et al. (2020) specifically study the impact of those shocks on the CEOs. Garmaise (2011) finds that the same staggered state-level changes in enforceability of non-compete contracts that we also utilize in our tests (updated with more recent data from Ewens and Marx, 2018), have a significant effect on mobility of executives included in the Execucomp database. This provides us with a strong motivation to consider those regulatory changes as an exogenous shock to mobility. Also, Kini et al. (2020) findings suggest a significant role for state-level non-compete enforceability in executive job contract negotiations, as greater enforceability seems to be compensated in form of higher pay. Several other papers, such as Samila and Sorenson (2011) and Marx et al. (2009) utilize state law changes on non-compete enforceability as exogenous shocks that affect incentives to innovate.

According to Ewens and Marx (2018), nine states amended their state laws<sup>15</sup> in order to strengthen the enforceability of non-compete laws: Florida (1996), Ohio (2004), Vermont (2005), Idaho (2008), Wisconsin (2009), Georgia (2010), Colorado (2011), Illinois (2011), and Texas (2011). We expect the CEOs of the companies located in these states to experience a negative shock to their executive mobility, which in turn should increase policy conservativeness of these CEOs. To determine a firm's location, we use the information about its headquarter address, provided by the Compustat database. Thus, for these nine states, our indicator variable *Non-Compete Change* takes a value of +1 in the years following the change, and 0 for the years before. During our sampling period (1993–2011), three other states weakened the enforceability of non-compete agreements: Louisiana (2001), Oregon (2008), and South Carolina (2010) and for these cases, *Non-Compete Change* takes a value of –1 for the years following the change, and zero for the years before. For all the other state-years this indicator variable takes the value of zero.

We conduct a difference-in-difference (dif-in-dif) analysis to assess how these changes in non-compete laws affect our risk-mobility relationship. We focus on the firms that are headquartered in the states where non-compete laws were amended (strengthened or weakened), while the firms from the rest of the states serve as a reference group.<sup>16</sup> State-year (interacted) or firm fixed effects are utilized to achieve proper identification in this dif-in-dif analysis. In column (1) of Table 2, we run a risk-mobility regression where we relate our *PRI* measure to the state-level mobility indicator, *Non-Compete Change*. The control variables are similar to the ones in Coles et al. (2006). As indicated by the significant negative sign of *Non-Compete Change*, the risk appetite of the firms located in the corresponding states decreases (increases) significantly after the non-compete laws strengthen (weaken). In terms of economic magnitude, the impact of *Non-Compete Change* on *PRI* is comparable in magnitude to the impact exerted by stock returns (standardized coefficients are –0.04303 vs. –0.0399; see column (2)). Thus, when CEO mobility is exogenously restricted by laws, the firms take less risk with their corporate policies.

### 5.2. Restricted mobility due to trade secrets protection laws (Inevitable Disclosure Doctrine)

For our next dif-in-dif analysis we utilize the staggered adoption (or rejection) of the Inevitable Disclosure Doctrine (IDD) by the U. S. state courts as an exogenous shock to CEO mobility. This doctrine aims to protect firms' trade secrets, and in effect makes it difficult for former employees to work for rival firms. According to Klasa et al. (2018), IDD “is applicable even if the employee did not sign a non-compete or non-disclosure agreement with the firm, there is no evidence of bad faith or actual wrongdoing, or the rival is located in another state.”

Using the staggered adoption and rejection dates of IDD laws by 21 states as provided in Table 1 of Klasa et al. (2018), we construct our dummy *IDD Restricted Mobility* (=1) to indicate the firms located in a state that recognizes these laws (i.e., the year is after the recognition year, but before the rejection year). For the rest of the cases, this dummy receives the value of zero. Using *IDD Restricted Mobility* as a CEO mobility indicator, we run our risk-mobility regressions with firm or state fixed effects. Since industry and year shocks are removed during the construction of *PRI*, we do not employ such fixed effects here. The significant negative sign of *IDD*

<sup>15</sup> Ewens and Marx (2018) describe in detail the circumstances under which each of these states amended their employee non-compete laws and why these changes constitute a material shift to the enforceability of these laws. Note that these amendments to non-compete laws constitute different events restricting employee mobility than the laws associated with the inevitable disclosure doctrine (IDD) that is aimed at protecting firms' trade secrets (see Klasa et al., 2018). For example, for the state of Florida, the non-compete laws were changed by Florida Statute §542.35, which came into effect on July 1, 1996. It affected all the contracts signed by Florida based CEOs from 1997 onwards. This statute was passed by the Florida's state legislature and it constitutes a different mobility-restricting event than the Florida court case (Fountain v. Hudson Cush-N-Foam Corp., 122 So. 2d 232 (Fla. Dist. Ct. App. 1960)) that recognized the Inevitable Disclosure Doctrine (IDD) in the state of Florida in year 1960, which was later on overturned in year 2001 (see Table 1 in Klasa et al., 2018).

<sup>16</sup> In Table A4 of Online Appendix we show that parallel trend assumptions are satisfied for such a dif-in-dif analysis. Our tests are methodologically similar to the ones in Klasa et al. (2018).

**Table 2**

Risk-mobility relationship when legal restriction on CEO mobility is imposed.

VARIABLES	(1) PRI	(2) PRI	(3) PRI	(4) PRI
<i>Non-Compete Change</i>	−0.4303*** [0.000]	−0.0399** [0.043]		
<i>IDD Restricted Mobility</i>			−0.1027*** [0.000]	−0.0333*** [0.001]
Log(Sales)	−0.3094*** [0.000]	−0.3888*** [0.000]	−0.3094*** [0.000]	−0.3985*** [0.000]
MTB	0.1636*** [0.000]	0.0007 [0.970]	0.1636*** [0.000]	0.0014 [0.884]
Sales Growth	0.0205 [0.124]	0.0102 [0.272]	0.0205* [0.066]	0.0113 [0.164]
Stock Return	−0.0866*** [0.000]	−0.0453*** [0.000]	−0.0866*** [0.000]	−0.0462*** [0.000]
Log(Cash Pay)	0.0023 [0.901]	−0.0521*** [0.000]	0.0023 [0.839]	−0.0519*** [0.000]
Delta	−0.0090 [0.297]	0.0075 [0.377]	−0.0090 [0.126]	0.0075 [0.545]
Vega	0.0302 [0.112]	−0.0417*** [0.002]	0.0302** [0.011]	−0.0406*** [0.000]
Constant	−0.2480*** [0.000]	−0.9339*** [0.000]	−0.4085*** [0.000]	−0.8966*** [0.000]
Observations	13,825	13,825	13,825	13,825
R-squared	0.264	0.775	0.265	0.774
State-Year F.E.	YES	NO	YES	NO
Firm F.E.	NO	YES	NO	YES

The table implements our identification strategy using two special cases where CEO mobility is highly restricted. The first identification test focuses on the states where the enforceability of employee non-compete agreements has changed (see [Ewens and Marx, 2018](#)). During our sampling period (1993–2011), nine states strengthened this enforceability: Florida (1996), Ohio (2004), Vermont (2005), Idaho (2008), Wisconsin (2009), Georgia (2010), Colorado (2011), Illinois (2011), and Texas (2011). For these states, our indicator variable *Non-Compete Change* takes a value of +1 in the years following the change, and 0 for the years before. During our sampling period, three states weakened the enforceability of non-compete agreements: Louisiana (2001), Oregon (2008), and South Carolina (2010) and for these cases *Non-Compete Change* is −1 for the years following the change, and 0 for the years before. For all the other state-years this indicator variable takes a value of 0. The second identification test relies on staggered adoption/rejection of Inevitable Disclosure Doctrine (IDD) by some U.S. state courts. *IDD Restricted Mobility* takes a value of one if a firm is headquartered in a state where IDD is in effect (i.e., the year is after the IDD adoption year and before the rejection year); zero otherwise. For the exact dates of adoption/rejection of IDD by a given state, please see [Klasa et al., \(2018\)](#). The regression control variables are as suggested by [Coles et al. \(2006\)](#) and are defined in Appendix A. *Policy Riskiness Index (PRI)* is constructed as described in [Section 4](#). The sample period is 1993 through 2011. In Columns (1,3) state-year interacted fixed effects and in the rest of the columns firm fixed effects (f.e.) are applied to obtain proper identification through a dif-in-dif analysis. To ease the economic interpretation of index coefficients, all the variables in the regressions are standardized. The standard errors are calculated using clustering at the state level and *p*-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

*Restricted Mobility* indicates that recognition of IDD in a state reduces *PRI* of the local firms. Economically, IDD changes have, again, similar-in-size economic effect as the stock returns (−0.0337 vs. −0.0467).<sup>17</sup> It is interesting to note that the inverse relation between IDD changes and our policy riskiness measure *PRI* contrasts with [Klasa et al. \(2018\)](#) finding that IDD changes are connected with increases in leverage. This highlights the potential that individual risk measures may move to counterbalance each other, and that creating a comprehensive *PRI* measure is justified.

Following a methodology similar to the one in [Table 5 of Klasa et al. \(2018\)](#), we verify that parallel trend assumptions are satisfied for our dif-in-dif analysis (see Online Appendix, Table A4). The risk-taking behavior of firms located in the focal state change only after the adoption of these laws and not before.

In summary, the special cases of exogenously imposed legal restriction on local CEOs' outside option in some U.S. states allow us to

<sup>17</sup> Please note the signs of Vega variable, which captures the convexity of compensation schemes ([Guay, 1999](#)): it is positive and not statistically significant (in column 1) and negative and significant when we use firm fixed effects (column 2). Our interpretation is that a CEO's outside options has similar incentive power as Vega in inducing riskier corporate policies ([Rajgopal and Shevlin, 2002](#); [Coles et al., 2006](#)). After controlling for CEO's outside options shocks, the sign of compensation incentive variable becomes either insignificant or negative.

establish a causal link between the CEO outside option concept of [Holmström \(1982\)](#) and the excessive policy conservatism of [Hirshleifer and Thakor \(1992\)](#). When CEO mobility is decreased due to local law changes, excessive policy conservatism becomes a more serious problem.<sup>18</sup>

## 6. Creating firm-specific measures of CEO mobility

In this section, we estimate a CEO's likelihood of staying in her current job (or, alternatively, the likelihood that she will switch jobs) in a given year. In contrast to previous section, we conduct the analysis at the firm/CEO level. It is challenging to assess a particular CEO's set of outside opportunities and to ascertain her intentions and desire to take a different job. A CEO may contemplate leaving her company, but various managerial perks, risk-aversion, and/or loyalty make it less likely for an actual change of employment to occur. Due to these challenges, we estimate CEO mobility with three different methods and use the information incorporated in a large number of different variables. We explain each method separately below.

### 6.1. Individual mobility measure 1: predicted mobility

For this measure of CEO mobility, we rely on observed voluntary job changes by CEOs. Using ExecuComp data between 1993 and 2011, we determine the instances when the CEO of a given firm accepts an executive position with a greater total pay at another firm.<sup>19</sup> While the ExecuComp dataset indicates that there are hundreds of such cases (we identify more than 300 incidences during our sampling period), a more rigorous manual check reveals that most of these cases involve mergers or restructurings rather than true changes of employment. We manually confirm (by reading the official announcements and the related news articles) 73 actual cases in which a CEO moves to a higher-paying executive position in a different firm within ExecuComp database (see Appendix A for details on how we create our variable *Switch Jobs*).<sup>20</sup> Only five of these incidences involve CEOs who move to another company more than once during our sampling period (the turnaround specialists). Using this sample of voluntary company-switching CEOs, we estimate a probit model to determine the firm and CEO characteristics that significantly affect the probability of job-hopping in a given year.

When forming our set of factors associated with a CEO's propensity to voluntarily change jobs (i.e., *Predicted Mobility*), we rely on the existing literature. Several studies relate CEO turnover to various CEO-specific, firm-specific, industry-specific, or location-specific characteristics. For example, a CEO's ability and performance is likely to be an important determinant of CEO mobility ([Fee and Hadlock, 2003](#); [Chang et al., 2010](#); [Demerjian et al., 2012](#); [Custodio et al., 2013](#)). All else equal, more able CEOs are more likely to take policy risks, because if a CEO of high ability takes a risky project and fails, then, to the extent the market understands her ability, she is still likely to get a good job at another firm. To capture a CEO's relative ability score, we construct a ranking variable (*CEO Ability*, which takes values from 0 to 3) as a sum of three separate dummies that indicate inherent talent of the CEO and whether or not that CEO is able to demonstrate that talent through her performance in the company. Individuals who become a CEO at a younger age are likely to be very gifted, and they should have a higher relative ability score (see [Custodio and Metzger, 2014](#)). Thus, our first dummy, *Fast Track CEO*, takes a value of one if the CEO assumed the position at a very young age (younger than 43 years old, which is the cutoff for the bottom quartile of the age at which the manager becomes a CEO), and zero otherwise.<sup>21</sup> The second dummy used to construct our CEO ability score is *Outstanding Performance*, which indicates whether, in a given year, a talented CEO is actually delivering on her potential by ranking her company in the top quartile of its industry (SIC2) in terms of cash flows (see Appendix A for further details). Finally, in measuring a CEO's ability we also consider whether or not a CEO is externally hired (*External CEO* = 1). This variable has been widely used in the literature (e.g., [Custodio and Metzger, 2014](#)) and it indicates whether a CEO is hired from the more competitive external labor market. Externally hired CEOs are closely vetted, and firm-CEO match appropriateness is more likely to be externally certified by the highly competitive managerial search process. When for a given CEO all three of these dummies<sup>22</sup> have values of zero (one), it indicates lowest (highest) possible relative ability and *CEO Ability* takes a value of 0 (3). When only one or two of these

<sup>18</sup> As an additional layer of robustness tests, we implement propensity score matching in conjunction with our staggered adoption of state laws related to IDD or non-compete changes. The treatment variables are *Non-Compete Change* and *IDD Restricted Mobility*. Essentially, we match the treated firms (the firms that reside in those state-years for which the treated variables are turned on) with control firms that are not affected by these law changes using the propensity score matching technique (caliper of 0.01). Our matching procedure uses nine different dimensions (2-digit industry, year, and the seven control variables listed in Table 2) to match treated and control observations. The results confirm that the policy riskiness index (*PRI*) of the treated firms is statistically significantly lower (at 1% level) than the control firms. Results available from the authors.

<sup>19</sup> By constraining our focus on confirmed cases of parallel moves, we obtain a small sample of voluntary CEO turnover in comparison to [Parrino \(1997\)](#) and [Campbell et al. \(2011\)](#), who consider departures for reported personal or business reasons unrelated to the firm's activities also as voluntary.

<sup>20</sup> Consistent with these findings, [Gibbons and Murphy \(1992\)](#) report that only about 2.2% of their sample of 1631 departing CEOs take CEO positions with other firms. Similarly, [Cziraki and Jenter \(2020\)](#) claim that only 3% of the new CEOs are recruited directly from CEO positions in other firms. [Agrawal and Walkling \(1994\)](#) show that the CEOs of target firms who lose their jobs after a merger deal generally fail to find another CEO job in any public corporation. [Fee et al. \(2018\)](#) find that only 4% of CEOs that leave their firms get comparable or better jobs at another public firm.

<sup>21</sup> Manual checking reveals that less than 4% of these *Fast Track* CEO cases correspond to founder CEOs.

<sup>22</sup> Using education-related ability indicators is practically impossible in our context due to limited availability of the education background information to only the managers that are covered by BoardEx data (see [Custodio and Metzger, 2014](#)). Upon matching our CEO sample (which involves around 5200 different CEOs) with the BoardEx data, we were able to find education information for less than half of our CEOs.

dummies are one, then *CEO Ability* takes values of 1 or 2, respectively.<sup>23</sup> See Appendix A for more details about the construction of this ability measure.

Besides ability, other CEO characteristics can also affect mobility. A CEO who has been with the company for a very long time is less likely to switch jobs (Balsam and Miharjo, 2007; Gibbons and Murphy, 1992; Gao et al., 2015). We use *Tenure* to capture this characteristic. Similarly, CEO Age can be an important driver of *CEO Mobility*. Bertrand and Shoar (2003) find birth cohort managerial fixed effects, and Serfling (2014) suggests that older CEOs tend to be reluctant to engage in adventurous job hopping due to the high fixed costs of adapting into a new job (e.g., the learning curve about the new company's economic fundamentals and employee culture). A high current total compensation (relative to other CEOs) may either dissuade a manager from actively seeking a new job (Gao et al., 2015) or, alternatively, it may indicate a skillful and highly marketable manager. We determine a CEO's relative pay decile within all the CEOs in ExecuComp for each year, and use this variable (*Relative Pay Decile*) as another CEO characteristic important in estimating her propensity to change jobs. As a proxy for a CEO's "connectedness" we use a dummy to capture whether the CEO has an interlocking membership in another firm's board of directors (*Interlocking*). Finally, we utilize the variable *Percent Insider CEOs* (suggested by Cremers and Grinstein, 2013) to gauge the percentage of CEOs who are hired from within the same industry. The higher this number is, the easier it is for a CEO to move to another firm within the industry.

We add to this list another potentially important determinant of the probability of changing jobs in a given year. We postulate that a CEO's past tendency to change firms makes her more likely to do so again in the future. Ryan and Wang (2016) and Dittmar and Duchin (2016) show that the past employment history of a CEO affects both her decision-making and her future employability. We therefore look at the behavior of the same executive (using the EXECID variable in ExecuComp), and count how many times this executive has moved around from one firm to another. We adjust this variable by the number of years this individual appears as an executive in the ExecuComp database. The adjusted measure reflects the average number of job changes relative to the total number of years employed as an executive (i.e., it is a frequency measure). We term this variable *Past Job Moves*. This variable captures the past mobility pattern (or career history) of an executive, which is an important CEO mobility indicator according to Ryan and Wang (2016) and Dittmar and Duchin (2016).

The above-mentioned seven characteristics<sup>24</sup> constitute our main specification for estimating a CEO's propensity to change jobs in a given year. These characteristics are more likely to be associated with voluntary CEO turnovers rather than with forced ones. This is a desirable feature for us since we seek to approximate the voluntary CEO mobility (or a CEO's outside options) concept. We estimate the CEO job changing probit regression as:

$$P(\text{Switch Jobs}_{i,t} = 1 | X) = \Phi(\beta_0 + \beta_1 X_{1,i,t-1} + \dots + \beta_7 X_{7,i,t-1}) \quad (3)$$

where the dummy variable *Switch Jobs<sub>i,t</sub>* takes the value of one if, during year *t*, the CEO *i* is associated with a different firm than during year *t-1*, and zero otherwise; the variables *X<sub>1</sub>*, *X<sub>2</sub>*, ..., *X<sub>7</sub>* represent the seven determinants of *i*'th CEO's mobility in a given year *t*; and  $\Phi(\cdot)$  is the cumulative normal distribution function.

Table 3 column (1) presents the results from this probit specification when both year and industry fixed effects are used.<sup>25</sup> We measure the control variables at the year-end prior to the year of the job change (i.e., if a CEO changed jobs in July 2003, we use the accounting variables of that CEO's old company for the fiscal year 2002). All of the controls enter with their expected signs and each of the coefficients is significant at the conventional levels.

Next, we introduce a number of additional controls to test the robustness of our estimates in Column (2). The controls include a dummy variable that indicates whether the CEO is also the chairman of the board of directors (*Chair*); a variable measuring the equity portion of the CEO's total compensation (*Equity Pay*); a variable indicating the nature of the industry's products (*Homogenous Products Industry*) as suggested by Parrino (1997) and Gao et al. (2015); and a variable capturing the geographical location of the firm's headquarters (*Firms in Same MSA*) as in Francis et al. (2016), Deng and Gao (2013), and Yonker (2017). The results from these specifications are shown in columns (2–8). None of these additional controls has a statistically significant effect on the propensity of changing jobs. Thus, when calculating the predicted value from our probit regression (i.e., when estimating our *Predicted Mobility* measure) we do not use these variables, but instead apply industry and year fixed effects. We do, however, utilize these variables in our next individual measure of CEO mobility (see Section 6.2).

Our CEO mobility measure (*Predicted Mobility*) is essentially the predicted propensity of a CEO to change jobs during year *t*,

<sup>23</sup> Use of Demerjian et al.'s (2012) measure of CEO ability yields qualitatively similar results (available upon request). We also considered using the General Ability Index (GAI) of Custodio et al. (2013). However, this index, as was originally constructed by the above authors, is available only from 1993 to 2007 (we thank the authors for making this index publicly available). Our sampling period is 1993 to 2011. Furthermore, most of the components of this General Ability Index (e.g., past number of positions, number of different firms the manager worked for, number of industries she worked for, etc.) involve variables that are closely associated with our CEO mobility concept. For these reasons, we decided to create our own measure of CEO ability, the one that is not directly built-upon CEO mobility indicators. This allows us to properly disentangle the impact of CEO mobility concept from the impact of CEO ability concept.

<sup>24</sup> In un-tabulated tests, we conducted a robustness test: when estimating the probit regression we use all 14 of the variables, regardless of whether they are statistically significant or not. The predicted mobility measure constructed from these alternative probit regressions yield qualitatively similar results and are available upon request.

<sup>25</sup> Since many CEOs never change their jobs during our sampling period, utilizing CEO or firm fixed effects effectively eliminates a large number of observations as *Switch Jobs* is 0 for such firms/CEOs throughout the entire sampling period. We therefore focus on specifications without CEO or firm fixed effects but with industry and year fixed effects—to construct our *Predicted Mobility* measure.

**Table 3**  
CEO mobility probit regressions.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	−0.0160*** [0.003]	−0.0162*** [0.002]	−0.0156*** [0.004]	−0.0162*** [0.002]	−0.0160*** [0.003]	−0.0161*** [0.003]	−0.0164*** [0.004]	−0.0151*** [0.005]
CEO Ability	0.0971* [0.059]	0.0966** [0.047]	0.0960** [0.050]	0.0978* [0.059]	0.1011** [0.045]	0.0966** [0.050]	0.0972* [0.058]	0.0998** [0.043]
Interlocking	0.3096* [0.100]	0.3102* [0.093]	0.3120* [0.097]	0.3151* [0.092]	0.3103* [0.092]	0.3100* [0.091]	0.3147* [0.093]	0.3142* [0.090]
Past Job Moves	1.5617*** [0.000]	1.5628*** [0.000]	1.5756*** [0.000]	1.5636*** [0.000]	1.5319*** [0.000]	1.5651*** [0.000]	1.5700*** [0.000]	1.5709*** [0.000]
Percent Insider CEO	0.0099** [0.021]	0.0100** [0.041]	0.0100** [0.021]	0.0094** [0.025]	0.0091* [0.055]	0.0097* [0.055]	0.0096** [0.028]	0.0100** [0.043]
Relative Pay Decile	0.0335* [0.076]	0.0329* [0.083]	0.0304* [0.093]	0.0336* [0.080]	0.0330* [0.082]	0.0335* [0.076]	0.0282* [0.090]	0.0328* [0.081]
Tenure	−0.0169** [0.033]	−0.0172** [0.049]	−0.0169** [0.033]	−0.0165** [0.041]	−0.0171** [0.031]	−0.0169** [0.032]	−0.0169** [0.034]	−0.0158** [0.045]
Chair		0.0176 [0.875]						
Equity Pay			0.0412 [0.479]					
Firms in Industry				−0.0002 [0.545]				
Firms Same MSA					0.0002 [0.428]			
Herfindahl Sales						0.1226 [0.877]		
LogCashPay							0.0345 [0.520]	
NCE Index								0.0024 [0.908]
Constant	−2.9836*** [0.000]	−2.9900*** [0.000]	−3.0167*** [0.000]	−2.9215*** [0.000]	−2.9597*** [0.000]	−2.9810*** [0.000]	−3.1423*** [0.000]	−3.0538*** [0.000]
Observations	17,997	17,997	17,960	17,976	17,924	17,976	17,997	17,923
Industry F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.101	0.101	0.102	0.102	0.103	0.102	0.102	0.103

Shown are the results from our probit regressions predicting a CEO's propensity to switch jobs while retaining her CEO title. We use the results from this table to construct our *Predicted Mobility* measure. The dependent variable is *Switch Job*, which is 1 if during a given year a CEO becomes an executive of another company with a higher pay (manually verified 73 cases of CEO job switch for a higher-paid job), and equal to 0 otherwise. The control variables are the 14 variables that are previously identified by the literature as important determinants of executive turnover (see the text for references). These variables are defined in details in Appendix A. All the control variables are lagged by one period. See text for explanations on why year and industry fixed effects are necessary. The standard errors are calculated using clustering at industry level and *p*-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

conditional on the seven essential determinants ( $X_1, X_2, \dots, X_7$ ) explained above. We construct it using:

$$\text{Predicted Mobility}_{i,t} = \Phi\left(\hat{\beta}_0 + \hat{\beta}_1 X_{1,i,t-1} + \dots + \hat{\beta}_7 X_{7,i,t-1}\right) \quad (4)$$

where  $\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_7$  are the coefficient estimates from the above probit regression (as in column (1) of Table 3). In our sample, the annual (mean, median, minimum, maximum, standard deviation) values of this mobility indicator are (0.1795%, 0.1271%, 0.001%, 12.6439%, 0.2720%), respectively. To facilitate the interpretation of the regression coefficients, in all of our regressions below we use the standardized version of this mobility measure.

The advantage of this mobility measure is that it is based on actual job changes, and thus can yield a more reliable estimation of the determinants of a CEO's likelihood to change jobs in the future. The main disadvantage of this measure is that the sample of observed job switching CEOs is small (only 73 observations).

## 6.2. Individual mobility measure 2: principal component mobility

For our second measure of CEO mobility, we utilize principal component analysis (for similar applications, see for example [Fraccasi and Tate \(2012\)](#) and [Custodio et al. \(2013\)](#)). This mobility measure overcomes the problem of the regression-based analysis in our *Predicted Mobility* variable having to rely on a small sample of actual observed CEO job changes. The principal component analysis utilizes an alternative variable-reduction procedure to extract the main factor that creates the variations in all the variables that are reported to affect CEO turnover. We postulate that the first principal component extracted from this analysis, which we will term *Principal Component Mobility* (or briefly *PC Mobility*), is the main driver of mobility. This *PC Mobility* measure has the advantage of



incorporating the information from known drivers of CEO mobility (the 14 variables we explain below), and thus it is more reliable than a single-variable-based CEO mobility measures.

From the extant literature on CEO turnover, we identify 14 variables that are reportedly important determinants of CEOs job opportunities and their desire to change jobs voluntarily.<sup>26</sup> Each of these variables is likely to capture a different aspect of a CEO's propensity to change jobs. Each of them contains some redundancy and noise<sup>27</sup> and thus each, in isolation, is an imperfect measure of CEO mobility. Principal component analysis eliminates this redundancy and distills the underlying driver of the variation in these variables.

The first extracted component in principal component analysis accounts for the maximal amount of total variance in these 14 observed variables. In our case, this first factor has an eigenvalue of 1.99 and accounts for roughly 14% of the total variance among variables.<sup>28</sup> We take this first factor as our second individual measure of a CEO's mobility (*PC Mobility*). The annual (mean, median, minimum, maximum, standard deviation) values of this factor are (0.0134, 0.0194, -3.2935, 4.7295, 1.0021), respectively. The economic interpretation of these values is not straightforward. Hence, in our regression analyses below, we use the standardized version of this variable to facilitate comparisons between the effects of each independent variable.

As a robustness test, we create a weighted factor using the first three factors from the principal component analysis, in which the weights are the eigenvalues of each factor. Our results with this weighted factor are qualitatively similar to the results with the first factor. The remaining details of this principal component analysis are available from the authors.

### 6.3. Individual mobility measure 3: CEO immobility

With our third individual measure of mobility, we capture the inverse of the CEO mobility concept (*Immobility*). For this purpose, we rely on the intuition from Gibbons and Murphy (1992), who suggest that it takes time for newly-appointed CEOs to demonstrate their capabilities and to increase their marketability.<sup>29</sup> Namely, we conjecture that a newly-appointed CEO would be reluctant to immediately seek a new CEO post.<sup>30</sup> Thus, we consider the first three years of a CEO's tenure as the period when she will be less willing to voluntarily change jobs. This immobility measure should also alleviate firm-CEO match problem arising from high-risk firms recruiting risk-loving CEOs. Hirshleifer et al. (2012) suggest that the effects of such matching are most prevalent during the early years of CEO tenure, which is why they exclude first four years of observations when they test whether the relation that they find between CEO overconfidence and innovation is robust to controlling for endogenous matching.

Prior literature on newly appointed CEOs documents several factors that may generate biases against our hypothesis that fresh CEOs avoid risk-taking. Pan et al. (2015) and Cziraki and Groen-Xu (2020) suggest that appointments of new CEOs coincide with other major corporate changes, including shocks to the investment opportunity set faced by the firm. Gao et al. (2012) study forced CEO turnover events and find that they tend to be instigated by deteriorating performance, and that they trigger changes in corporate policies. Both Pan et al. (2015) and Clayton et al. (2005) report a connection between newly appointed CEOs and greater stock volatility, which may reflect both corporate changes and the fact that market is unsure about the new CEOs' abilities. Interestingly, Gao et al. (2012) find that firms that introduce pay cuts to their CEOs experience policy changes that are similar to those experienced by newly appointed CEOs, namely they reduce capital expenditures, R&D, and leverage. Behavioral consistency between CEOs with pay cuts and CEOs with fresh appointments is in line with our prediction that newly appointed CEOs avoid risk-taking.

To determine the firm-years that correspond to the first three years of a CEO's tenure, we hand collect data on CEO turnover. We

<sup>26</sup> These 14 variables are as follows: Age (as suggested by Bertrand and Shoar (2003), Yim, 2013, and Serfling (2014)); CEO Ability (see Chang et al. (2010), Custodio et al. (2013), and Custodio and Metzger (2014), among others), Chair (see Yonker (2017)); Cash Pay and Equity Pay (these two CEO compensation variables are suggested by Balsam and Miharjo (2007)); Firms Same MSA (number of firms in the same metropolitan statistical area, as suggested by Francis et al. (2016)); NCE Index (a non-competing index created by Garmaise (2011)); Past Job Moves (Ryan and Wang, 2016; Dittmar and Duchin, 2016); Percent Insider CEOs in a given industry (suggested by Cremers and Grinstein (2013)); Interlocking and Relative Pay Decile (two variables used by Gao et al. (2015)); Firms in Industry and Sales Herfindahl (two variables used in Gao et al. (2015), Deng and Gao (2013), and Cremers and Grinstein (2013) that measure the number of firms in the industry and whether the industry has oligopolistic structure, respectively); and Tenure (as Benson and Davidson III (2009) suggest with tenure, the CEO's financial and personal commitment to the firm increases to the point where the risk aversion effect dominates any incentive effect). All of these variables are formally defined in Appendix A.

<sup>27</sup> Measurement error in proxy variables stems from two sources. First, papers employing these variables often focus on general CEO turnover (i.e., CFOs promoted to CEOs, etc.), but not necessarily on CEO's horizontal job hopping. Second, any observable variable is, in general, a noisy proxy of a given latent driver of human decision making. This is especially true for our study, as we analyze a CEO's complex decision-making process regarding whether to stay in her current company or seek employment elsewhere. Numerous factors that are difficult to measure and observe (such as economic, socioeconomic, psychological, family, personal history, etc.) can affect such decisions.

<sup>28</sup> Comparing the standardized scoring coefficients of the 14 variables, we observe that most of the variables load in the expected way when extracting the first principal component (first eigenvector). The variables with negative scoring coefficients are Age, Tenure, and Firms in Industry. The variables such as Cash Pay, CEO Ability, Chair, Firms in Same MSA, Past Job Moves, and Relative Pay Decile, have large positive scoring coefficients. The rest of the variables have small positive scoring coefficients.

<sup>29</sup> Indeed, Pan et al. (2015) find a connection between newly appointed CEOs and greater stock volatility, as market is unsure about their abilities. However, their result implies a bias against us finding significant results in our risk-mobility tests when Immobility is used as the main independent variable, as we expect mobility to have a positive relation to risk.

<sup>30</sup> A simple analysis confirms this conjecture. Of the 73 CEO-to-CEO job change cases we discussed earlier, only one occurred within three years of that CEO's starting date of the previous CEO position.

start with ExecuComp data and determine when an executive (indicated by EXECID) assumes the title of a CEO in given firm (GVKEY). We then manually check whether indeed this is a case of a true CEO turnover. Our final sample of CEO turnovers includes 2753 cases where a new CEO assumes her position between 1993 and 2011. Note that, unlike in the definition of a *CEO Job Switch* variable, in these CEO turnover cases, the executive assuming the CEO title does not have to be a former CEO of another company.

We use this large sample of CEO turnover cases to create our *CEO Immobility* dummy by assigning the value of one to the first three years of the CEO's tenure (including the year when she was appointed), and zero otherwise. The (mean, median, minimum, maximum, standard deviation) values of this mobility indicator are (0.125, 0.000, 0.000, 1.000, 0.330), respectively. In our regressions below, we again rely on the standardized version of this indicator.

#### 6.4. Validating our mobility measures

In this subsection, we conduct a validity test for the accuracy of our CEO-specific mobility measures. We focus only on the 73 cases identified earlier in Section 5, in which a CEO has been observed to engage in voluntary job-hopping activity. These are the cases we used to construct our *Predicted Mobility* measure. These observed cases of CEOs being mobile could serve as a good out-of-sample validity test for the accuracy of our *PC Mobility* measure.

To set up our validity test, we first rank each CEO-year observation into deciles according to the value of their *PC Mobility* (the highest decile holds the highest values of the mobility measure observed during that year). We then focus on the year just before those 73 CEOs left their companies for CEO positions at other companies. We compare their readings of mobility to the mobility values for the entire CEO sample during that year. We find that the median (mean) CEO in “the 73 mobile CEOs” sample has a *PC Mobility* decile of 8 (7.24), while the rest of the sample has a median (mean) mobility decile of 5 (5.5). The difference between the medians (means) is significant at the 1% level. Clearly, our ex-ante *PC Mobility* measure<sup>31</sup> can predict reasonably well the actual ex-post job changing cases. This out-of-sample validity test confirms that our *PC Mobility* measure has a good predictive power on whether a CEO would engage in voluntary CEO job hopping. Also, among these 73 cases of CEOs changing jobs, only one involves a CEO leaving a company after the non-compete laws are strengthened in the headquarter state of the company.<sup>32</sup>

In our Online Appendix we conduct some univariate analyses across CEOs grouped based on our CEO-specific mobility measure, *Predicted Mobility*. There are significant differences in the corporate policies (*PRI*, *Business Diversification Policy*, *Capital Structure Policy*, and *Investment Policy*) of more mobile CEOs relative to the other CEOs: more mobile CEOs are associated with riskier corporate policies. Further details are in Section OA1, Table A5 of our Online Appendix.

Finally, Table A6 in Online Appendix shows the correlation coefficients between our three CEO mobility measures and some relevant CEO characteristics (i.e., previously documents managerial style indicators). Measures of a CEO's outside options meaningfully correlate to the managerial characteristics as predicted by prior studies (see Section 6.1). Our mobility measures, however, have the advantage of incorporating the information from all of these variables.

### 7. Relationship between mobility and policy risk: CEO-specific mobility measures

In this section, we test our hypothesis that a CEO's willingness and ability to change jobs affects her decision making. In our risk-mobility regressions, we utilize firm- and CEO-specific measures (*PC Mobility*, *Predicted Mobility*, *Immobility*). With CEO-specific measures we can only apply industry and year fixed effects, as firm fixed effects substantially reduce variation in these CEO mobility measures: many important variables used in creating our CEO-specific mobility measures (e.g., *CEO Ability*, *Interlocking*, *Past Job Moves*, *Percent Insider CEOs*) show very little variation year over year.

First, we study how mobility of the CEO affects the combined riskiness of corporate policies (as captured by our *Policy Riskiness Index*, *PRI*). As we argue earlier, a CEO whose present value of human capital is less tied to her current job is less likely to be risk averse. A reduction in her risk aversion, in turn, should be reflected in the combined policy risk she takes on behalf of her company. Table 4 reports regression results on the risk-mobility relationship. Consistent with our prediction, CEO mobility has a strong positive relation to our policy riskiness index. The results are consistent across all three of our mobility proxies (see columns (1) through (3)).<sup>33</sup> *Immobility* is negatively related to risk, as that measure is inversely related to the CEO mobility concept. Since all the variables in Table 4 are standardized, the economic interpretation is straightforward. For example, one standard deviation increase in our *Predicted Mobility* leads to an increase in policy risk of about 0.0713\*(standard deviation of *PRI*). Put differently, a CEO's mobility changes *PRI* by roughly the same amount as the one standard deviation in stock returns (+0.0713 vs. -0.0787). Considering that signals received from the stock market (i.e., stock returns) have significant impact on corporate policies (see, among others, Chen et al., 2007), the economic impact of CEO mobility is not negligible.

<sup>31</sup> In an un-tabulated robustness test, we remove one of the 14 variables (*Past Job Moves*) from our principal component analysis, since this variable is closely related to the “the 73 mobile CEOs” sample. That is, we create *PC Mobility* measure using only the remaining 13 variables (see footnote 26). Again, we find highly significant differences between the median *PC Mobility* decile of the “the 73 mobile CEOs” and the rest of the sample.

<sup>32</sup> A simple *t*-test using all the state-years with and without law changes reveals that this case of one CEO moving after non-compete laws are strengthened is a statistically insignificant counter example (at 10% significance level).

<sup>33</sup> In an un-tabulated robustness test, we remove the observations associated with founder CEOs or CEOs that belong to a founding family. These cases affect less than 4% of your observations. We then rerun the regressions in Table 4. The qualitative conclusions are unchanged. Results available upon request.

**Table 4**  
Risk-mobility regressions using CEO-specific mobility measures.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	PRI (OLS)	PRI (OLS)	PRI (OLS)	PRI (GMM)	PRI (GMM)	PRI (GMM)
<i>Predicted Mobility</i>	<b>0.0197**</b> [0.044]			<b>0.0025***</b> [0.000]		
<i>PC Mobility</i>		<b>0.0713***</b> [0.002]			<b>0.0232***</b> [0.000]	
<i>Immobility</i>			<b>−0.0127***</b> [0.001]			<b>−0.0191***</b> [0.000]
Log(Sales)	−0.2929*** [0.000]	−0.3093*** [0.000]	−0.2903*** [0.000]	−0.5098*** [0.000]	−0.5038*** [0.000]	−0.5250*** [0.000]
MTB	0.1180*** [0.000]	0.1138*** [0.000]	0.1193*** [0.000]	−0.0014*** [0.000]	−0.0129*** [0.000]	−0.0124*** [0.000]
Sales Growth	0.0026 [0.820]	0.0034 [0.762]	0.0016 [0.914]	−0.0042*** [0.000]	−0.0082*** [0.000]	−0.0082*** [0.000]
Stock Return	−0.0776*** [0.000]	−0.0787*** [0.000]	−0.0780*** [0.002]	−0.0451*** [0.000]	−0.0361*** [0.000]	−0.0403*** [0.000]
Log(Cash Pay)	−0.0089 [0.626]	−0.0530** [0.015]	−0.0076 [0.536]	−0.0050*** [0.000]	0.0119*** [0.000]	−0.0012*** [0.000]
Delta	0.0079 [0.335]	0.0110 [0.161]	0.0072 [0.412]	0.0326*** [0.000]	0.0337*** [0.000]	0.0295*** [0.000]
Vega	0.0189 [0.369]	0.0154 [0.459]	0.0187* [0.082]	0.0082*** [0.000]	−0.0056*** [0.000]	0.0144*** [0.000]
Constant	0.0816 [0.752]	0.0866 [0.742]	0.0820 [0.466]	1.5399*** [0.000]	−1.1609*** [0.000]	1.5445*** [0.000]
Observations	13,825	13,825	13,825	13,825	13,825	13,825
R-squared	0.304	0.305	0.304	–	–	–
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
Sargan-Hansen ( <i>p</i> -val)	–	–	–	0.2470	0.4034	0.3672

The table shows the relationship between policy risk and our CEO mobility measures. *Policy Riskiness Index (PRI)* captures the combined risk level of four corporate policies: Investment, capital structure, business diversification, and excess cash policies (for details see Section 4). *Predicted Mobility* is the predicted value from the probit model for the CEOs switching jobs from one company to another (see Section 6). *Principal Component Mobility (PC Mobility)* is the first factor (highest eigenvalue) from a principal component analysis of 14 variables that are likely to capture a CEO propensity to move to another company (as suggested by various literature papers). The third measure of CEO mobility is the *Immobility* variable, which is a dummy that takes a value of one if the year corresponds to the first three years of a CEO's tenure in the current job. The sample period is 1993 through 2011. The regression control variables are as suggested by Coles et al. (2006) and are defined in Appendix A. As an alternative inference method, we utilize Blundell and Bond (1998)'s two-step system GMM (shown under columns (4–6)). We treat all of the right-hand side variables as endogenously determined together with PRI. These variables' lagged values constitute our GMM-style instruments. Our IV-style instrument variables are *Vacant CEO Positions* and *Supply Potential CEOs*, and are defined in the text. The *p*-value from Sargan-Hansen test is also provided ( $H_0$  is “the instruments as a group are exogenous”). To ease the economic interpretation of index coefficients, all the variables are standardized. The standard errors are calculated using clustering at firm level and *p*-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

Next, we continue to assess the robustness of our findings in Table 4. Endogeneity in the form of simultaneity bias can manifest itself in this context if any variables that simultaneously determine a CEO's mobility and her corporate policies have been omitted (Roberts and Whited, 2013; Coles et al., 2012). Thus, in our next analysis, we look for estimation methodologies whereby the potentially endogenous relationship between corporate policy risk and CEO's mobility is “shocked” by exogenous event(s). Namely, as an alternative estimation methodology, we use system generalized method of moments (GMM) as implemented by Arellano and Bover (1995) and Blundell and Bond (1998). This type of estimation is recommended in corporate governance research (Wintoki et al., 2012) and it is appropriate in our case for two main reasons. First, in our context, endogeneity bias may originate from any of the right-hand-side (control) variables of our risk-mobility regression from Table 4; not just from the *CEO Mobility* measures. When multiple potentially endogenous variables exist, the system GMM is an appropriate method. The second advantage of Arellano-Bond system GMM is that it is specifically designed to treat “small-*T* large-*N*” panels. In our case, the time dimension is  $T = 19$  years and we have  $N = 1864$  firms (19,761 firm-years).

To implement this GMM method, we treat all of the right-hand-side variables as endogenously determined together with our policy riskiness index (*PRI*). These variables' lagged values constitute our GMM-style instruments. We also use two exogenous instrumental variables as our IV-style instruments that capture the supply and demand dynamics within the CEO labor market. Our first instrument, *Vacant CEO Positions*, is the percent of CEO jobs in an industry that are perceived as (or known to be) vacant in a given year (i.e., demand for CEO talent increases). When there is a vacant CEO position at a given firm, all the CEOs that are from the same industry are

considered as likely candidates to fill this position. This should affect the unobserved mobility of this CEO.<sup>34</sup> Arguably, in most instances such vacancies at other firms occur exogenously to the CEO of a given firm, which makes this variable a good candidate for an IV-style instrument (i.e., exclusion criterion for an instrument is also satisfied). To create such an instrumental variable, we count the number of CEO turnovers that occurred in a given industry (SIC2) and scale it by the total number of CEOs in that industry. We then take forward this variable by one year, assuming that an observed CEO turnover is preceded by a period when the corporate board is actively looking to replace the CEO.

Another variable that can serve as an IV-style instrument is a variable that can capture the supply of executives of certain age that could potentially become a CEO when needed. In our sample of current CEOs, the median age when an executive became a CEO is 50 (determined using *Age* and *BecameCEO* variables from ExecuCOMP). Therefore, we construct an instrument that counts the total number of top five executives in ExecuCOMP within an industry (2-digit SIC) in a given year that are close to 50 years of age (i.e., the counted executive should have an age between 45 and 55, inclusively).<sup>35</sup> To account for the relative size of each industry, we scale this total number of executives by the total number of firms in that industry (*Firms in Industry*). The higher this ratio is in a given year, the higher the supply of potential CEOs within that industry. A large supply of potential CEOs should have a negative effect on mobility of an existing CEO within that industry, and thus, this instrument (which we call *Supply Potential CEOs*) satisfies the relevance criterion. However, there is no alternative economic channel—other than serving as potential competitors for the CEO job—through which the number of executives of certain age in an industry have an effect on the risk taking of the focal firm's CEO. Put differently, this instrument should satisfy the exclusivity criterion (i.e., supply of potential CEOs is affecting firm's *PRI* exclusively through *CEO Mobility* of the existing CEOs).<sup>36</sup>

The results from our two-step system GMM estimation are presented under columns (3, 4) of Table 4. At the bottom of the table, we report also the *p*-value of the Hansen test (the null hypothesis is “the instruments as a group are exogenous”). The hypothesis cannot be rejected and overfitting does not seem to be a problem as *p*-values are large, but firmly below 1. Most importantly, our mobility measures preserve their signs and explanatory power on *PRI*. We reach similar conclusions if instead of GMM, we use a Heckman two-stage procedure (the treatment effects model) as in Faccio et al. (2016). To see these results please refer to our Online Appendix (Table A7). Thus, the positive relationship between mobility and policy risk is robust to using GMM estimation or Heckman procedure with exogenous IV-style instruments.

### 7.1. The role of corporate governance

Weak corporate governance can exacerbate CEO risk aversion problem (John et al., 2008; Fahlenbrach, 2009), and thus affect the risk-mobility relationship. Prior findings indicate that CEO turnover decisions are affected by board characteristics (Weisbach, 1988; Borokhovich et al., 1996; Huson et al., 2001; Graham et al., 2020), institutional equity ownership (Parrino and Sias, 2003; Huson et al., 2004), and blockholder ownership (Denis, Denis, and Sarin, 1997). Therefore, we next analyze how corporate governance impacts the relationship between policy risk and CEO mobility. Below we summarize our findings; the detailed results are in Online Appendix (Section OA2, Table A8).

We construct a four-dimensional corporate governance score (*Corporate Governance Quality*) that reflects the effectiveness of internal monitoring and managerial incentives, such as high CEO ownership and high proportion of independent board members, and the presence of the external monitors such as institutional investors and blockholders. For details on our corporate governance measure, see Online Appendix, Section OA2. Using the *Corporate Governance Quality* score, we conduct a subsample analysis for strong and weak corporate governance subsamples. The results are presented in Table 5, Panel A (more detailed results are in the Online Appendix). The risk-mobility relationship is more pronounced (coefficients are significant) for the weak corporate governance subsample. The CEO policy conservatism is more severe among firms with weak governance, and thus an increase in CEO mobility has a more substantial impact on risk taking in that subsample. This suggests that CEO mobility can serve as an effective incentive mechanism that reduces agency problems related to managerial policy conservatism, and in that role CEO mobility can substitute for weak corporate governance structures.

### 7.2. The role of CEO social capital

According to Faleye et al. (2014) and Ferris et al. (2017), low CEO social capital can also induce corporate policy conservatism, as such CEOs are less likely to find similar jobs when the projects fail. Thus, we expect the risk-mobility relationship to be amplified in the low social capital subsample. In this subsection, we briefly summarize our findings from this cross-sectional analysis; the full set of results are in Online Appendix (Section OA3).

Following prior literature (Cingano and Rosolia, 2012; Nguyen, 2012; Faleye et al., 2014; Ferris et al., 2017), we approximate for

<sup>34</sup> Industries in which CEOs tend to come from outside the firm are more homogeneous in the sense that CEO talent from other firms can easily replace CEO talent from inside the firm. Therefore, this variable, *Vacant CEO Positions*, satisfies the relevance criteria to instrument the labor mobility of the CEOs employed in certain industries.

<sup>35</sup> Using a different range, say  $\pm 6$  years around the median age of 50, does not change our qualitative conclusions.

<sup>36</sup> We utilize the Montiel Olea and Pflueger (2013) test for instrument relevance. The results of the test indicate that our instruments cannot be considered weak. The utilization of these instruments eliminates 95% of the original endogeneity bias that existed in the OLS estimation. Results available upon request.

Table 5

The role of corporate governance and CEO's social capital.

Panel A. Risk-Mobility Regressions: Corporate Governance Quality						
	Strong CG	Weak CG	Strong CG	Weak CG	Strong CG	Weak CG
<b>Predicted Mobility</b>	<b>0.0123</b> [0.425]	<b>0.0313**</b> [0.013]				
<b>PC Mobility</b>			<b>0.0148</b> [0.662]	<b>0.0867**</b> [0.011]		
<b>Immobility</b>					<b>−0.0217</b> [0.195]	<b>−0.0134**</b> [0.041]
Control Variables	YES	YES	YES	YES	YES	YES
Observations	4313	5058	4313	5058	4313	5058
R-squared	0.318	0.321	0.318	0.323	0.319	0.320
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
F-statistics	p-value = 0.0457		p-value = 0.0507		p-value = 0.0741	

  

Panel B. Risk-Mobility Regressions: Social Capital (CEO's Network Size)						
	High SC	Low SC	High SC	Low SC	High SC	Low SC
<b>Predicted Mobility</b>	<b>−0.0180</b> [0.332]	<b>0.0852***</b> [0.002]				
<b>PC Mobility</b>			<b>0.0202</b> [0.676]	<b>0.1651***</b> [0.000]		
<b>Immobility</b>					<b>−0.0015</b> [0.869]	<b>−0.0383***</b> [0.000]
Control Variables	YES	YES	YES	YES	YES	YES
Observations	3405	3596	3405	3596	3405	3596
R-squared	0.366	0.332	0.340	0.346	0.366	0.332
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
F-statistics	p-value = 0.0221		p-value = 0.0062		p-value = 0.0260	

The table analyzes the relationship between policy risk and CEO mobility for two subsamples sorted based on firms' corporate governance quality (Panel A) or social capital (Panel B). The sample and the control variables are the same as in Table 4 in the main text. A firm's corporate governance quality (*Corporate Governance Quality*) is measured as the sum of four dummy variables capturing the independence of the corporate board, CEO's ownership in the firm, and the effectiveness of the external monitoring by blockholders and institutional investors (see Appendix A for further details). In Panel A, using its *Corporate Governance Quality* score, we classify a firm into the strong corporate governance subsample (*Strong CG*) if this governance score for a given year is greater than 2. If this score is less than 2, we consider the firm to be of weak corporate governance (*Weak CG*). The cases when this score is exactly 2 (i.e., the mediocre corporate governance quality cases) are excluded from either subsample to avoid severe subsample imbalances in terms of number of observations. For each of these subsamples, we run our risk-mobility regressions using the same specification as in Table 4. Similarly, in Panel B, a CEO's social capital is defined by the size of her social network ( $CEO\ Social\ Capital = \ln(1 + networksize)$ ; see Appendix A) and the firms are classified into *High SC* subsample (CEO has above sample median network size) and *Low SC* subsample (CEO has below sample median network size). At the bottom of the table we report the Wald test *F*-statistics that coefficients are the same between the two subsamples. The standard errors are calculated using clustering at firm level and *p*-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

CEO's social capital by the size of social networks (measured as  $CEO\ Social\ Capital = \ln(1 + networksize)$ , which uses BoardEx's variable called *networksize*). *CEO Social Capital* is calculatable only for a small subset of our original mobility sample, because of two reasons. First, BoardEx is available only after 1999 and our sample starts in 1993, and second, data on some CEOs in our mobility sample cannot be found in BoardEx. Therefore, in this subsection we work with a much smaller sample size of 7001 firm-years with available data for CEO social capital and the other control variables.<sup>37</sup>

Using *CEO Social Capital* variable for each firm during each year, we divide our sample into two subsamples based on whether the firm has above (*High SC* subsample) or below industry median values for this variable (*Low SC* subsample). Next, for each social capital subsample, we run our risk-mobility regressions using the same specification as in Table 4. We present the results in Table 5, Panel B (for more detailed results see the Online Appendix, Table A9). The risk-mobility relationship is statistically significant only in the *Low SC* subsample. That is, the CEO policy conservatism is more severe among firms with low social capital, and thus a change in CEO mobility has a significant impact on corporate policy risk only in that subsample.

It is important to note that, while social capital is a catalyst that can enable CEO mobility, the latter concept is much wider. CEO mobility incorporates not only the CEO's ability but also willingness to change employment. Our mobility measures capture certain mobility-effects that have no direct connection to social capital. For instance, our state-level identification (Section 5) relies only on local law changes, which lack any obvious links to CEO's social capital. Among the seven variables that underlie our CEO-specific

<sup>37</sup> This sample shrinkage prevents us from using social capital as one of the variables used in constructing our CEO-specific mobility measures (see Section 6).



mobility measure, namely *Age*, *CEO Ability*, *Interlocking*, *Past Job Moves*, *Percent Insider CEO*, *Relative Pay Decile*, and *Tenure*, arguably only *Interlocking* is directly linked to CEO social capital. Thus, while social capital and mobility may be related concepts, mobility captures effects that are distinct from CEO social capital. Our results in Panel B of Table 5 emphasize this distinct role of CEO mobility.

In our Online Appendix, we also investigate whether risk-mobility relationship is more pronounced when the firm suffers from asymmetric information problems. Following Ferris et al. (2017), we use analysts' forecast error as a measure of a firm's asymmetric information. Using a subsample analysis (see Online Appendix, Section OA4, Table A10), we obtain some weak evidence that the risk-mobility relationship is more pronounced for firms in the high-asymmetric information subsample. Thus, mobility seems to be more effective in reducing CEO policy conservatism when firm's information environment is poor.

### 7.3. Severance packages

Severance packages offer a contractual solution to the excessive policy conservatism problem (Hirshleifer and Thakor, 1992; Ju et al., 2014). Section OA5 (Table A11) of our Online Appendix conducts a simple horse race between CEO mobility and severance packages to assess their relative effectiveness in reducing excessive policy conservatism. The results suggest that the connection between CEO mobility and risk-taking are robust to controlling for severance packages.

### 7.4. CEO mobility and individual policy components

Next, we analyze how *CEO Mobility* affects separately each of the policy components. Considering corporate policy indicators' separately will shed light on the individual effects of each component of the *PRI Index*. Again, we follow Coles et al. (2006) in our choice of control variables, while controlling for industry and year fixed effects. The results are reported in Table 6. CEO mobility has the strongest impact on investment ( $\log(1 + \text{RND}/\text{CAPX})$ ) and business diversification policies ( $\log\text{SEGN}$ ), as indicated in Panel A of Table 6. Based on the results with our *Predicted Mobility* and *PC Mobility* measures, more mobile CEOs tend to take more corporate risk by: i) investing heavily in projects with more uncertain outcomes (as captured by higher  $\text{RND}/\text{CAPX}$ ); and ii) by operating in fewer areas of business. *Immobility* measure yields similar inferences, with the exception of the investment-immobility regression, in which the statistical significance falls short of conventional levels.

On the other hand, Panel B of Table 6 indicates that the risk level of leverage policy is not significantly affected by CEO mobility. Leverage adjustments happen slowly over time (Graham and Leary, 2011), which is likely to contribute to our non-finding. It is, however, interesting to note the effects of outside options on CEO behavior appear to differ from those of executive stock options, as Shue and Townsend (2017) find a positive relation between option grants and leverage. The mobility/excess-cash relationship is significant only for *PC Mobility*.<sup>38</sup> Therefore, we conclude that CEOs whose human capital is less tied to their current company increase the total riskiness of their corporate policies, and they achieve this primarily through increased investments in risky (R&D intensive) projects and refocusing on a limited number of business areas.

### 7.5. Non-linear effects of mobility on risk-taking

It is reasonable to expect that the effects of mobility on risk-taking are non-linear. The marginal effect of an additional outside labor market option should be far greater for a CEO with limited outside options than for a CEO who already has abundant outside options. The model by Giannetti (2011) suggests that when CEOs face a large number of alternative employment opportunities, they will follow a sub-optimal investment strategy, as the incentives to acquire firm-specific skills needed for risky investments diminish in such a setting. For CEOs with ample outside opportunities, those opportunities may thus actually lead to less risk-taking.

We consider the non-linearity of the risk-mobility relationship in Table 7, where we rerun the specifications in Columns (1–3) of Table 4, with the added covariates representing the squared terms of *Predicted Mobility* and *PC Mobility* in their respective columns. Our third mobility measure of *Immobility* does not lend itself to this type of analysis, as *Immobility* is defined as an indicator variable taking only values of one and zero. The results from a GMM estimation (endogeneity bias adjustment as in Table 4), are shown under Columns (3) and (4). The regressions reported in Table 7 employ the same control variables as in Table 4, but their coefficient values are omitted in the interest of space.

The results confirm the intuition that mobility has a non-linear effect on CEOs' risk-taking. We obtain consistent results across the mobility measures, indicating that mobility has a positive effect on risk-taking in general, but the squared terms of each mobility metric enter with negative coefficients. That is, the relationship between mobility and risk taking is “hump-shaped.” Inflection point of the quadratic function is estimated to be at 7.0816 for the *Predicted Mobility* (i.e., 7.0816% odds that a CEO will change job in that

<sup>38</sup> We have also analyzed the relationship between CEO Mobility and other corporate policies, such as *Operating Leverage* (defined as in Serfling, 2014) and *Working Capital* (defined as in Cassell et al., 2012). We find that *CEO Mobility* does not affect these particular policies either, which is consistent with our original conclusion that mobility reduces CEO's policy conservatism primarily through *Investment* and *Business Diversification* policies.

Table 6

Risk-mobility regressions: individual policy components.

Panel A: Risk-Mobility Regressions for Investment and Business Diversification Policies						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Investment	Investment	Investment	SEGN	SEGN	SEGN
<i>Predicted Mobility</i>	<b>0.0199***</b> [0.008]			<b>−0.0235**</b> [0.049]		
<i>PC Mobility</i>		<b>0.1248***</b> [0.000]			<b>−0.0320**</b> [0.020]	
<i>Immobility</i>			<b>−0.0034</b> [0.165]			<b>0.0567***</b> [0.000]
Log(Sales)	−0.2182*** [0.000]	−0.2417*** [0.000]	−0.2183*** [0.000]	0.2742*** [0.000]	0.2805*** [0.000]	0.2909*** [0.000]
MTB	0.0463*** [0.000]	0.0385*** [0.002]	0.0474*** [0.000]	−0.1059*** [0.000]	−0.1048*** [0.000]	−0.1000*** [0.000]
Sales Growth	−0.0366*** [0.001]	−0.0374*** [0.001]	−0.0366*** [0.001]	−0.0254*** [0.007]	−0.0252*** [0.003]	−0.0495*** [0.000]
Stock Return	−0.0428*** [0.000]	−0.0458*** [0.000]	−0.0427*** [0.000]	0.0194** [0.014]	0.0201** [0.019]	0.0155** [0.034]
Tenure	−0.0283* [0.058]	−0.0019 [0.905]	−0.0321** [0.030]	−0.0764*** [0.000]	−0.0779*** [0.000]	0.0225 [0.181]
Log(Cash Pay)	0.0302* [0.076]	−0.0496** [0.016]	0.0320* [0.060]	0.0519*** [0.007]	0.0708*** [0.000]	0.0612*** [0.001]
Excess Cash	−0.0162*** [0.003]	−0.0179*** [0.001]	−0.0162*** [0.003]	0.0046 [0.615]	0.0052 [0.481]	0.0286*** [0.002]
Leverage	−0.0718*** [0.000]	−0.0730*** [0.000]	−0.0721*** [0.000]	0.0625*** [0.003]	0.0629*** [0.000]	0.0637*** [0.002]
Delta	0.0496*** [0.000]	0.0541*** [0.000]	0.0494*** [0.000]	0.0221** [0.012]	0.0212** [0.020]	0.0126 [0.107]
Vega	0.0648*** [0.001]	0.0569*** [0.002]	0.0654*** [0.001]	0.0128 [0.543]	0.0143 [0.151]	0.0455** [0.027]
ROA	− [0.179]	− [0.075]	− [0.111]	−0.0181 [0.005]	−0.0190* [0.000]	−0.0381** [0.002]
Divid. Cut	− [0.005]	− [0.000]	− [0.002]	0.0300*** [0.005]	0.0293*** [0.000]	0.0341*** [0.002]
Constant	−0.2639 [0.305]	−0.2527 [0.342]	−0.2551 [0.323]	−0.1984 [0.397]	−0.2054* [0.061]	0.1762 [0.444]
Observations	14,857	14,857	14,857	13,825	13,825	13,825
R-squared	0.509	0.514	0.509	0.297	0.297	0.241
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES

Panel B: Risk-Mobility Regressions for Capital Structure and Excess Cash Policies						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Leverage	Leverage	Leverage	XCash	XCash	XCash
<i>Predicted Mobility</i>	<b>−0.0100</b> [0.468]			<b>0.0048</b> [0.710]		
<i>PC Mobility</i>		<b>0.0123</b> [0.533]			<b>0.0442**</b> [0.021]	
<i>Immobility</i>			<b>−0.0003</b> [0.963]			<b>0.0024</b> [0.796]
Log(Sales)	0.1596*** [0.000]	0.1571*** [0.000]	0.1596*** [0.000]	−0.0347*** [0.007]	−0.0438*** [0.001]	−0.0347*** [0.007]
MTB	0.0668*** [0.000]	0.0654*** [0.000]	0.0663*** [0.000]	0.0252** [0.017]	0.0225** [0.035]	0.0254** [0.016]
Tenure	−0.0042 [0.751]	0.0016 [0.908]	−0.0014 [0.915]	−0.0477*** [0.000]	−0.0379*** [0.003]	−0.0480*** [0.000]
Log(Cash Pay)	0.0283* [0.061]	0.0193 [0.299]	0.0274* [0.070]	0.0069 [0.587]	−0.0214 [0.216]	0.0073 [0.568]
Leverage	− [0.000]	− [0.000]	− [0.000]	−0.0923*** [0.000]	−0.0928*** [0.000]	−0.0923*** [0.000]
Delta	−0.0263* [0.098]	−0.0257 [0.103]	−0.0262* [0.098]	−0.0016 [0.716]	0.0001 [0.984]	−0.0016 [0.710]
Vega	−0.0383*** [0.003]	−0.0394*** [0.002]	−0.0386*** [0.003]	0.0099 [0.348]	0.0072 [0.488]	0.0101 [0.341]
ROA	−0.2018*** [0.000]	−0.2065*** [0.000]	−0.2017*** [0.000]	0.0217 [0.134]	0.0228 [0.125]	0.0217 [0.134]
NetPPE	0.1181*** [0.000]	0.1187*** [0.000]	0.1182*** [0.000]	−0.1083*** [0.000]	−0.1060*** [0.000]	−0.1084*** [0.000]

(continued on next page)

Table 6 (continued)

Panel B: Risk-Mobility Regressions for Capital Structure and Excess Cash Policies						
VARIABLES	(1) Leverage	(2) Leverage	(3) Leverage	(4) XCash	(5) XCash	(6) XCash
RND	[0.000] −0.1635***	[0.000] −0.1653***	[0.000] −0.1637***	[0.000] −0.0204**	[0.000] −0.0233**	[0.000] −0.0203**
ZScore	[0.000] −0.0325***	[0.000] −0.0317***	[0.000] −0.0326***	[0.042] 0.0165***	[0.023] 0.0170***	[0.042] 0.0165***
Sales Growth	[0.006] −	[0.006] −	[0.006] −	[0.003] −0.0326***	[0.002] −0.0329***	[0.003] −0.0325***
Stock Return	−	−	−	[0.002] 0.0741***	[0.002] 0.0729***	[0.002] 0.0742***
Constant	[0.261] 0.2964	[0.261] 0.2974	[0.264] 0.2950	[0.781] −0.0320	[0.801] −0.0296	[0.799] −0.0292
Observations	16,222	16,222	16,222	14,826	14,826	14,826
R-squared	0.264	0.266	0.267	0.088	0.088	0.088
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES

The table shows the relationship between the riskiness of the individual corporate policies and our three CEO mobility measures. Panel A shows the results from the investment (under columns “Investment”) and business diversification (“SEGN” for number of segments) policies. Panel B shows the results for capital structure (“Leverage”) and excess cash (“XCash”) policies. The control variables for each corporate policy risk are as suggested by Coles et al. (2006), and are defined in Appendix A. Our mobility measures are defined in the previous table. The sample period is 1993 through 2011. To ease the economic interpretation of index coefficients, all the variables in the regressions are standardized. The standard errors are calculated using clustering at firm level and *p*-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

particular year).<sup>39</sup> This value is far higher than the median mobility value of 0.1277% (the maximum predicted mobility value is 12.4626%), suggesting that only for a small number of observations (more specifically about 5.12% of our sampled firm-years) the mobility measure is sufficiently high to trigger a negatively-sloping risk-taking curve. The overwhelming majority of our sample (94.88% of observations) falls to the left side of the hump, where higher mobility is expected to induce more risk taking by the CEO. Similar calculations for *PC Mobility* suggest that about 8.35% of our observations are to the right of the inflection point. In un-tabulated results we find that the observations in which CEO mobility is very high (i.e., to the right of the inflection point) correspond to CEOs with high frequency of past job moves, high relative pay decile, high equity pay, and high vega.

The above findings are consistent with the idea that the incentives created by higher mobility affect the overwhelming majority of the CEOs. Increased mobility improves their willingness to engage in riskier corporate policies. At a very high level of mobility, however, outside optionality can have a perverse effect in creating a negative relationship between mobility and risk taking, in a fashion similar to what is reported in the executive stock options (Ross, 2004; Guay, 1999; Oyer and Schaefer, 2004) and executive ownership literatures (McConnell and Servaes, 1990; Himmelberg et al., 1999).

## 8. CEO mobility and shareholder value

The results that we have reported thus far suggest that a CEO whose mobility is limited (either due to various restrictions that she faces or due to her own unwillingness to change jobs) is likely to exhibit risk-aversion, and we argue that this finding is due to much of her human capital being dependent on the fate of her current firm. The availability of outside options appears to reduce a CEO's career concerns, and thereby also to reduce excessive conservatism in corporate policies. While more abundant outside options may increase a CEO's risk tolerance, it is unclear whether the increased risk-taking is beneficial to shareholders. This is the issue we tackle next.

We investigate whether current CEO mobility affects shareholder value, as approximated by Tobin's *q*. Since many shareholder-enhancing but risky projects would be passed over by a CEO with career concerns, this would lower the future cash flows and the current valuation of the firm. Therefore, ceteris paribus, our CEO mobility measures should be positively associated with the value of the firm.

Naturally, many factors can affect a firm's valuation. We directly control for various firm characteristics, such as size, profitability (ROA), level of cash holdings, operating leverage of the business (as captured by Plant, Property, and Equipment/Total Assets), dividend expenditures, acquisitions-related spending, and the firm's stock price performance during the last year (as measured by the total 1-year return). To avoid endogeneity, variables such as leverage, investment and R&D intensity, number of business segments, and stock volatility are excluded from this control list since they are also key drivers of our PRI variable. In un-tabulated tests we find that including these variables as controls do not qualitatively change our conclusions.

<sup>39</sup> The inflection point is calculated using  $(-\beta_1 / 2\beta_2)$  where  $\beta_1$  and  $\beta_2$  are the estimated coefficients of *Predicted Mobility* and its square, respectively. It is important to note that these coefficients should be estimated through a regression using the non-standardized variables. As mentioned before, Table 7 reports the coefficients of the standardized regressors, but in un-tabulated results we estimate that  $\beta_1$  is 0.1983 and  $\beta_2$  is −1.4001 using non-standardized variables.

**Table 7**  
Convexity of risk-mobility relationship.

VARIABLES	(1) PRI (OLS)	(2) PRI (OLS)	(3) PRI (GMM)	(4) PRI (GMM)
<i>Predicted Mobility</i>	0.0421*** [0.001]			
<i>Predicted Mobility</i> <sup>2</sup>	−0.0240** [0.038]			
<i>PC Mobility</i>		0.0723*** [0.002]		
<i>PC Mobility</i> <sup>2</sup>		−0.0244* [0.068]		
<i>Predicted Mobility (GMM)</i>			0.0297*** [0.000]	
<i>Predicted Mobility</i> <sup>2</sup> (GMM)			−0.0108*** [0.000]	
<i>PC Mobility (GMM)</i>				0.0255*** [0.000]
<i>PC Mobility</i> <sup>2</sup> (GMM)				−0.0101*** [0.000]
Controls Variables	YES	YES	YES	YES
Observations	13,825	13,825	13,825	13,825
R-squared	0.304	0.306	–	–
Industry F.E.	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES

The table shows the hump-shaped relationship between risk index and mobility. *Policy Riskiness Index (PRI)* and the CEO mobility measures are as defined in the previous table. Together with a given mobility variable, its squared transformation are added in the same equation to capture the convexity/concavity of the relationship between risk and mobility. That is, the coefficients of *Mobility* and *Mobility*<sup>2</sup> are estimated in the same equation with the same control variables as in Table 4. The results for these control variables are not shown to save space. Under columns (3, 4) the GMM estimation results are also presented (using the same specifications as in Table 4). The results with *Immobility* are not shown since the square of a dummy variable (*Immobility*) is the same dummy variable, and thus the analysis of non-linearity is meaningless. The sample period is the same as in the previous tables. To ease the economic interpretation of index coefficients, all the variables in the regressions are standardized. The standard errors are calculated using clustering at firm level and p-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

We also include three corporate governance variables that are set to capture value effects of the external monitoring of the firm's activities: the percentage of shares held by institutional investors, the percentage of shares held by large blockholders, and a dummy indicating whether the firm's board has a larger-than-median number of independent directors.

Furthermore, many macroeconomic factors and industry-shocks can impact a given firm's valuation. We therefore control for them through industry and year fixed effects. Our original estimation sample includes 19,761 firm years, covering the period from 1993 through 2011. We do not include the CEO characteristics as separate control variables, since our mobility measures are derived using these characteristics (see Section 6).

The estimation results are presented in Table 8, Panel A. The results using *Predicted Mobility* and *PC Mobility*, which are our mobility measures that incorporate various CEO characteristics in them, indicate that mobility has a positive and statistically significant effect on firm value (Tobin's *q*).<sup>40</sup> The economic impact seems substantial, as well. The effect of *Predicted Mobility*, for instance, is at a magnitude larger than that of acquisitions (coefficient of 0.0487 vs. −0.0319 (un-tabulated)). Thus, CEO mobility seems to benefit shareholders.

In Panel B of Table 8, we utilize a two-step procedure where, in the first step, the riskiness of current corporate policies (*PRI*) is a function of a CEO's mobility. In the second step, the risk level of the current corporate policies affects the valuation of the firm (Tobin's *q*). As the first stage regression, we utilize the same risk-mobility regressions as in Table 4 and obtain the predicted *PRI*. Since these results are presented earlier in Table 4, they are suppressed here to save space. In the second stage, we estimate how the predicted *PRI* from the first stage affects firm value while firm and year fixed effects are applied. All three proxies of mobility yield a positive and significant relation between the predicted *PRI* and shareholder value. Note that the coefficients in Panel B represent the impact of corporate policy risk (the predicted *PRI*) on Tobin's *q*, and thus they capture an economically different concept from the coefficients in Panel A, which represent the impact of *CEO Mobility* on Tobin's *q*.

In Panel C of Table 8 we conduct a mediation analysis (as in Baron and Kenny, 1986) to quantify the indirect impact of CEO mobility on shareholder value through corporate policy riskiness. The independent variable is the mobility measure, the mediator variable is our policy riskiness index (*PRI*), and the dependent variable (Tobin's *q*) is affected by both the mediator and the independent variable. Following the procedure in the Appendix B of Fedaseyev et al. (2018), we formally perform our mediation analysis (the details are in our Online Appendix, Section OA6, Table A13). Under the second column of Panel C of Table 8 we see that the coefficients

<sup>40</sup> Using return on assets (ROA) instead of Tobin's *q* together with firm fixed effects (a la Dittmar and Duchin, 2016) yields qualitatively similar conclusions.

**Table 8**  
CEO mobility, corporate policy risk, and shareholder value creation.

Panel A. Value-Mobility Regressions (OLS)						
	Tobin's <i>q</i>	Tobin's <i>q</i>	Tobin's <i>q</i>			
<i>Predicted Mobility</i>	0.0421*** [0.002]					
<i>PC Mobility</i>		0.0514*** [0.000]				
<i>Immobility</i>			−0.0047 [0.550]			
Control Variables	YES	YES	YES			
Observations	12,909	12,909	12,909			
R-squared	0.182	0.183	0.181			
Industry F.E.	YES	YES	YES			
Year F.E.	YES	YES	YES			
Panel B. 2SLS Regressions: Risk-Mobility Regressions (1st stage); Value-Risk Regressions (2nd stage)						
	Tobin's <i>q</i>	Tobin's <i>q</i>	Tobin's <i>q</i>			
<i>Predicted PRI</i> (using <i>Predicted Mobility</i> )	0.9133*** [0.001]					
<i>Predicted PRI</i> (using <i>PC Mobility</i> )		0.8521*** [0.000]				
<i>Predicted PRI</i> (using <i>Immobility</i> )			0.9511*** [0.000]			
Control Variables	YES	YES	YES			
Observations	12,909	12,909	12,909			
Firm F.E.	YES	YES	YES			
Year F.E.	YES	YES	YES			
Panel C. Mediation Analysis: Presented are the results from Step 2 & Step 3; Step 1 results are in <a href="#">Table 4</a>						
	Tobin's <i>q</i> (Step2)	Tobin's <i>q</i> (Step3)	Tobin's <i>q</i> (Step2)	Tobin's <i>q</i> (Step3)	Tobin's <i>q</i> (Step2)	Tobin's <i>q</i> (Step3)
<i>Predicted Mobility</i>	0.0421*** [0.002]	0.0372*** [0.002]				
<i>PC Mobility</i>			0.0514*** [0.000]	0.0462*** [0.000]		
<i>Immobility</i>					−0.0047 [0.550]	−0.0043 [0.128]
<i>PRI</i> (moderator)		0.0974*** [0.000]		0.0978*** [0.000]		0.0981*** [0.000]
Control Variables	YES	YES	YES	YES	YES	YES
Observations	12,909	12,909	12,909	12,909	12,909	12,909
R-squared	0.182	0.185	0.183	0.186	0.181	0.184
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
Total effect mediated	—	11.6%	—	10.1%	—	8.5%

The table shows the relationship between CEO mobility and shareholder value (firm's *Tobin's q*). The sample period is 1993 through 2011. The three mobility measures are *Predicted Mobility*, *PC Mobility*, and *Immobility* and are defined in the previous tables. Panel A regression estimates the determinants of firm value (*Tobin's q*). The control variables are *log(Sales)*, *Cash Holdings*, *ROA*, *NetPPE*, *Stock Return*, *Dividend Dummy*, *Acquisitions*, *Institutional Ownership*, *Blockholders Percent*, and *Independent Board Dummy* (if the fraction of independent board members is above 0.5, this dummy is 1). Panel B utilizes 2SLS where the first stage constitutes of the risk-mobility regressions that predict the risk-taking by a CEO using various firms and CEO characteristics plus the CEO mobility measure (as in Table 4). In the second stage we estimate the valuation impact of such risk taking by inputting the *Predicted PRI* (from first stage) and by utilizing firm and year fixed effects. To save space only the second stage results are reported, but the first stage results are similar to Tables 4. In Panel B we report the coefficients representing the impact of corporate policy risk (the predicted *PRI*) on *Tobin's q*, and thus they capture an economically different effect than the coefficients from Panel A, which represent the impact of *CEO Mobility* on *Tobin's q*. Panel C report the results from the mediation analysis (a la Baron and Kenny, 1986) that involves three steps (see also Fedaseyev et al., 2018). Step1 runs the regressions reported Table 4 (not reported here to save space). Step2 runs the regressions in Panel A of this table (results are under columns named "Step2" of Panel C). To assess the size of the mediation effect, Step3 runs the same regressions as in Step2 but includes *PRI* as part of the independent variables (shown under columns named "Step3"). The regressions in Step3 measure the mediation effect on *Tobin's q*, whereby the mediator is *PRI*. The mediation effect (in %) is shown at the bottom of Panel C regressions and it is calculated as the decrease in the size of the coefficient for the mobility measure when *PRI* is also in the regression (e.g., total effect mediated for *Predicted Mobility* is calculated as  $(0.0421 - 0.0372) / 0.0421 = 11.6\%$ ). To save space in this table we suppress reporting the coefficient estimates for the controls, but they can be found in our Online Appendix, Table A12 and A13. To ease the economic interpretation of index coefficients, all the variables in the regressions are standardized. All variables are defined in Appendix A. The standard errors are calculated using clustering at firm level and *p*-values are shown in [square] brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.



for both variables, *PRI* and *Predicted Mobility*, are statistically significantly positive at 1% level suggesting that both variables affect shareholder value. However, the size of the coefficient for *Predicted Mobility* is reduced from +0.0421 (column 1) to +0.0372 (column 2), which suggests that a certain portion of the CEO mobility's effect on shareholder value is occurring through *PRI* (i.e., a mediation is taking place as described in [Baron and Kenny \(1986\)](#)). The size of the mediation effect (shown at the bottom of the panel) varies between 8.5% and 11.6% depending on the mobility measure. This mediation analysis confirms that mobility does affect corporate policy riskiness, and that this effect has substantial economic (valuation) consequences for the firm.

## 9. Conclusion

CEOs' risk-aversion and career concerns can lead to excessive conservatism in corporate policies. Solving this issue is as complex as human nature. Our evidence suggests that enhancing a CEO's mobility within the market for executive talent reduces the CEO's risk aversion. Improved executive mobility can alleviate the excessive policy conservatism problem, as increased CEO mobility serves as a real option, enhancing her human capital. We show that a more mobile manager is more likely to take policy risks that increase shareholder value. Our findings are also consistent with [Graham et al. \(2005\)](#) survey evidence that career concerns have a powerful effect on executive behavior.

To analyze the relationship between corporate policy risk and CEO mobility, we develop a corporate policy index that aims to provide a more complete picture of the overall policy risk undertaken by a CEO in a given year through firm's investment, business diversification, capital structure, and cash holding policies. Creation of such an index is novel to the literature and should enhance future research on the topic. Also, we propose several new proxy variables for a CEO's mobility within the executive labor market. Each one of these proxies is based on different econometric models and using different economic concepts, and thus together they provide a robust set of measures of a CEO's mobility. Using these mobility measures and the above-described comprehensive policy riskiness index (*PRI*) of a firm, we find that CEO mobility is positively related to *PRI* and also to shareholder value (as measured by Tobin's *q*).

Future research in the area could analyze how mobility of other executives (e.g., CFOs and COOs) affects their firms' policy riskiness. Similar cross-country analyses could also be done to understand how cultural, language, and legal constraints affect the risk-mobility relationship.

## Appendix A. Data description, source, construction, and summary statistics

Panel A. Variables Used in Constructing Policy Riskiness Index

Variable. Definition.	N	Mean	Median
<b>StDev of Returns:</b> This variable measures the standard deviation of the market adjusted monthly stock returns (or abnormal returns AR) over a certain period. A stock's abnormal return is calculated as $AR_{it} = R_{it} - R_{mt}$ , where $R_{it}$ is the stock <i>i</i> 's return for month <i>t</i> (with dividends) and $R_{mt}$ is the return on the CRSP equally-weighted market return during month <i>t</i> (with dividends). The period over which standard deviation is calculated is either 12, 36, or 60 months. Data source is CRSP monthly data files. When matching with the Compustat annual data, we use the standard deviation values corresponding to the month when the fiscal year ends.	66,686	0.1936	0.1371
<b>StDev of CFs:</b> The variable measures the standard deviation of the quarterly cash flows of a company calculated over 12 quarters (alternatively 4 quarters or 20 quarters) period. Cash flows (CF) variable is calculated as $CF = (IBQ + DPACTQ - DVY/FQTR) / ATQ$ . Compustat's Quarterly data is used. When matching with the annual data, we take the standard deviation values as of the fourth fiscal quarter (or the end of the fiscal year). We also calculate the industry-adjusted version of this variable using industry-median values during a given quarter (we call this variable <b>Ind-Adj CFs</b> ).	66,931	0.2061	0.0585
<b>StDev of ROA:</b> The variable measures the standard deviation of the quarterly return on assets (ROA) variable of a company calculated over 12 quarters (or alternatively 20 quarters) period. ROA variable is calculated as $ROA = NIQ / ATQ$ . Compustat's Quarterly data is used. When matching with the annual data, we take the standard deviation values as of the fourth fiscal quarter (or the end of the fiscal year). The industry-adjusted version of this variable (using the quarterly industry-median values) is called <b>Ind-Adj ROA</b> .	66,934	0.1683	0.0209
<b>Idios. Volatility:</b> The variables measures the stock's idiosyncratic volatility derived from Fama-French-Carhart 4 factor model. CRSP monthly data is used. The monthly values of the four factors are retrieved from Kenneth French's website. The following estimation procedure is applied. For each stock we extract the residual value, $\epsilon_{it}$ , from the four-factor regression: $R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \gamma_iSMB_t + \chi_iHML_t + \mu_iUMD_t + \epsilon_{it}$ (5) where $R_{it}$ is the return of the firm <i>i</i> during month <i>t</i> , $R_{ft}$ is the return on three-month Treasury bills, $R_{mt}$ is the return on CRSP's value-weighted market index, $SMB_t$ is the difference in the returns of value-weighted portfolios of small stocks and big stocks during, $HML_t$ is the difference in the returns of value-weighted portfolios of high book-to-market stocks and low book-to-market stocks, and $UMD_t$ is the difference in returns of value-weighted portfolios of firms with high and low prior momentum. All of these variables are taken contemporaneously during month <i>t</i> . The construction of these factors is discussed in detail in <a href="#">Fama and French (1993)</a> and in <a href="#">Carhart (1997)</a> . To calculate the factor coefficients, $\alpha_i$ , $\beta_i$ , $\gamma_i$ , $\chi_i$ , $\mu_i$ , we use 3-years of data (36 months; we require at least 12 months of data), but we obtain coefficient estimates as of the calendar year (i.e., not the rolling coefficients for each month). Then, we take these coefficients and estimate residuals, $\epsilon_{it}$ , for each month within this time window (one coefficient per PERMNO for each year and match with the data; estimate sigma error term for each PERMNO for each month using predicted values from monthly observations of the factors). We calculate the <i>idiosyncratic volatility</i> as the rolling standard deviation of monthly sigma residuals for the past 36 months (similar to <a href="#">Ang et al., 2009</a> ). We repeat this procedure for 12-month and 60-month time frame. At the end, we match with annual data using the fiscal year end month's values of idiosyncratic volatility.	61,536	0.1748	0.1213
	49,353	0.0095	0.0514

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Panel A. Variables Used in Constructing Policy Riskiness Index			
Variable. Definition.	N	Mean	Median
<b>Excess Cash:</b> We follow Opler et al. (1999) and Dittmar and Mahrt-Smith (2007), and define excess cash as the residual value, $\mu_{it}$ , for firm $i$ in year $t$ , which is estimated from the cash regression: $\ln(\text{Cash}_{it}) = \beta_1 \ln(\text{Assets}_{it}) + \beta_2 \text{CF}_{it} + \beta_3 \text{NWC}_{it} + \beta_4 \text{MVE}_{it} + \beta_5 \text{CAPX}_{it} + \beta_6 \text{Leverage}_{it} + \beta_7 \text{RND}_{it} + \beta_8 \text{DIV}_{it} + \varphi_i + v + \tau_t + \mu_{it} \quad (6)$ where $\varphi_i$ captures firm fixed effects, $v$ represents industry fixed effects, $\tau_t$ represents year fixed effects. The variables used in the regression are defined below.			
<b>Assets:</b> The total assets (AT) of the firm. Data retrieved from Compustat annual files. In millions of dollars.	64,255	2168.0	161.54
<b>Cash Flows (CF):</b> The cash flow of each firm, defined as the Income Before Extraordinary Items (IB) + Depreciation and Amortization (DP) – Preferred Dividends (DVP) – Common Dividends (DVC), scaled by total assets (AT). Compustat annual data is used.	59,144	−0.0401	−0.0316
<b>Investments (CAPX):</b> The total level of capital expenditures (CAPX) made by the firm for each fiscal year, scaled by total assets (AT). Data is from COMPUSTAT annual files.	63,522	0.0646	0.0396
<b>Dividend Dummy (DIV):</b> Takes a value of one when the firm pays a common dividend (DVC) during the fiscal year. Data is from Compustat annual files.	57,595	0.2892	0
<b>Leverage:</b> It is calculated as Short Term Debt (DLC) + Long Term Debt (DLTT) divided by assets (AT). We use annual Compustat data.	63,992	0.2568	0.1628
<b>Market Value of Equity (MVE):</b> It is equal to stock price as of the end of the fiscal year multiplied with the shares outstanding; both values are from CRSP monthly data. In millions of dollars.	56,089	2650.9	220.40
<b>Net Working Capital (NWC):</b> It is measured as NWC = (Current Assets (ACT) – Current Liabilities (LCT) – Cash Holdings (CHE)), divided by total assets (AT). Data is from Compustat.	55,963	0.2591	0.2726
<b>Research &amp; Development (RND):</b> The total level of Research and Development (XRD) reported by the firm for each fiscal year, scaled by firm's assets (AT). If the observation for the XRD is missing, we assume it is 0. Data is from Compustat annual files.	66,947	0.08022	0
Panel B. Variables Related to CEO Mobility			
Variable. Definition.	N	Mean	Median
<b>Age:</b> The age of the CEO as reported in ExecuComp.	25,114	55.314	55
<b>Cash Pay:</b> The logarithm of the cash pay (salary plus bonus) a CEO receives in a given year. Data is from ExecuComp.	26,196	6.7281	6.7301
<b>CEO Ability:</b> The sum of three dummy variables that indicate a CEO's ability and performance: $\text{CEO Ability} = \text{Fast Track CEO} + \text{Outstanding Performance} + \text{External CEO}$ . The CEOs with highest ability would have a maximum possible score of 3 and the ones with the lowest ability would have the minimum possible score of 0. About 0.54% percent of our sampled CEOs have the maximum score of 3; 13.53% of them have a score of 2; 47.89% have score of 1; and about 38.04% of them have a score of 0.	26,196	0.7656	1
<b>Chair:</b> An indicator variable taking a value of 1 if the CEO is also the chairman of the executive board, and 0 otherwise. The raw data is from ExecuComp, but manually checked for accuracy.	26,196	0.5529	1
<b>Corporate Governance Quality:</b> It is calculated as $\text{Corporate Governance Quality} = \text{More Independent Board} + \text{High CEO Ownership} + \text{High Institutional Ownership} + \text{High Blockholder Ownership}$ . A firm's board is considered more independent ( $\text{More Independent Board} = 1$ ) if the proportion of independent directors in its board is above the industry (Fama-French 48) median during that year. $\text{High CEO Ownership}$ takes value of 1 if the CEO's ownership in the company is above industry median during that year, and 0 if not. Similarly, $\text{High Institutional Ownership}$ and $\text{High Blockholder Ownership}$ is assumed 1 if the institutional investors and blockholders, respectively, own higher proportion of the stock shares relative to firm's industry peers during that year; otherwise these dummies are assigned a value of 0.	20,013	1.8966	2
<b>Equity Pay:</b> The ratio of equity pay (the sum of the grant-date value of restricted stock grants and the Black-Scholes value of granted options) divided by total pay (TDCL). If the variables in the nominator are missing in ExecuComp, they are assumed zero. Data is from ExecuComp.	25,983	0.5404	0.4310
<b>External CEO:</b> Dummy equal to one if the CEO is hired externally; if the CEO is internally hired, it is equal to zero. This variable has been widely used in the literature (e.g., Custodio and Metzger, 2014) and it indicates whether a CEO was internally promoted or s/he was hired from the more competitive external labor market. If a CEO was externally hired, s/he is probably closely vetted, and her talent is more likely to be externally certified by the highly-competitive managerial labor market. This external executive must be sufficiently skillful and able that the executive board passed up the existing top managers of the company and focused on this external hire as a better match for the company. Because the CEO-firm match forces were in play during this vetting process, such an external individual must possess certain skills and ability that the internal managers do not have. Data is from ExecuComp.	26,196	0.1847	0
<b>Fast Track CEO:</b> If a CEO assumed the position at an age younger than 43 (the cutoff for the lowest quartile of the variable AGE_BECAME_CEO from ExecuCOMP), then the dummy <i>Fast Track CEO</i> takes a value of 1; else it is zero. According to Custodio and Metzger (2014), individuals who become a CEO at a younger age are likely very gifted. This component of our CEO ability measure captures the inherent potential (or the talent) of a CEO, but it tells us nothing about whether the CEO delivers on her potential in terms of improved company performance. Data is from ExecuComp.	26,196	0.2517	0
<b>Firm's Asymmetric Information:</b> It is measured using the average analysts' forecast error for the firm during a given year. <i>Forecast Error</i> is defined the absolute value of analysts' earnings forecast error for the upcoming fiscal year, estimated as the absolute value of actual earnings minus the earnings forecast scaled by the stock price at the end of the year.	11,522	0.0090	0.0023
<b>Firms in Industry:</b> The number of firms in the same industry (2-digit SIC) as the firm as reported in Compustat.	25,622	323.92	191
<b>Firms Same MSA:</b> A variable that for each year counts the number of firms whose headquarters are located in the same MSA as our analyzed firm's headquarters. We use Compustat data about ZIP Codes of the firms' headquarters location. We map ZIP Codes to Metropolitan Statistical Areas as defined by US Census Bureau. According to Francis et al. (2016), "The general concept of a metropolitan statistical area (MSA), as defined by the US Census Bureau, is that of a large population nucleus, together with adjacent communities having a high degree of social and economic integration with that core." Thus, our	25,553	185.60	118

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Panel B. Variables Related to CEO Mobility			
Variable. Definition.	N	Mean	Median
variable captures whether or not the firm headquarters are located in the most highly populated areas and the most economically dense regions in terms of number of CEO jobs.			
<b>Herfindahl Sales:</b> It is the sum of squared market shares based on firms' sales among all Compustat firms in the same industry (2-digit SIC) and same year. This is the continuous version of the <i>Homogenous Products Industry</i> dummy variable explained above. Data is from Compustat annual files.	25,622	0.0831	0.0560
<b>Homogenous Products Industry:</b> An indicator variable that equals to 1 if the industry <i>Sales Herfindahl</i> index is below the sample median, and 0 otherwise. Industry <i>Sales Herfindahl</i> index is the sum of squared market shares based on firms' sales among all Compustat firms in the same industry (two-digit SIC) and same year. Annual Compustat data is used.	25,622	0.3600	0
<b>Interlocking:</b> A dummy variable that takes a value of 1 if the executive is listed in the Compensation Committee Interlocks section of the proxy as reported in ExecuComp. It indicates that the named officer is involved in a relationship requiring disclosure in the "Compensation Committee Interlocks and Insider Participation" section of the proxy. This generally involves one of the following situations: 1. The officer serves on the board committee that makes his compensation decisions; 2. The officer serves on the board (and possibly compensation committee) of another company that has an executive officer serving on the compensation committee of the indicated officer's company; 3. The officer serves on the compensation committee of another company that has an executive officer serving on the board of the indicated officer's company.	26,196	0.0498	0
<b>NCE Index:</b> The non-competition enforceability index for each state and year. The state is the U.S. state where the firm's headquarters are located as specified in Compustat. Index data is from <a href="#">Garmaise (2011)</a> . The paper reports this index up to year 2008. We update this data using <a href="#">Ewens and Marx (2018)</a> .	25,559	3.8342	4
<b>Outstanding Performance:</b> Using our <i>Cash Flows</i> variable (or alternatively ROA), we determine how the company managed by a given CEO has actually performed in any given year. The dummy variable <i>Outstanding Performance</i> captures whether a "talented" CEO has actually delivered on her potential. We consider a CEO's performance to be outstanding during that year ( <i>Outstanding Performance</i> = 1) if that CEO delivers an operating performance that is in the top quartile of the firm's industry (SIC2); otherwise this dummy is equal to zero. This variable is based on the findings of <a href="#">Eisfeldt and Kuhnen (2013)</a> and <a href="#">Jenter and Kanaan, 2015</a> . Annual Compustat data is used.	26,196	0.3292	0
<b>Past Job Moves:</b> It counts how many times the executive (EXECID) switched employers up to that point in time (sampling starts in 1993). This count number is scaled by the total number of years the executive has appeared in ExecuComp data up to that point in time (again, counting starts with year 1993). We use this value as measure of frequency of job switches this executive engaged in in the past. If the executive stays with the same firm up to that year (starting in 1993), then this variable is 0. When the executive switches her associated GVKEY for the first time, the variable takes a value of $1/N$ , where $N$ is the number of years past since the start of our sample in 1993, excluding the current year. Similarly, if the executive makes her second move, then it is $2/N$ , and so on. Since $N$ grows with years, such a scaling by $N$ penalizes for staying with the same firm for too long after you make your first move. The executive does not have to hold a CEO title. The executive is considered as associated with a GVKEY if ExecuComp data considers this executive as one of the top firm managers whose compensation information is reported. ExecuComp data is used. If ExecuComp reports multiple GVKEY associations of an EXECID in a given year, we have to assume it is correct, because we have no practical way of verifying the accuracy of such data. For CEOs-only data we are able to hand check every single case, because the number of observations is reasonably small. However, for other top executives the manual checking of a multiple association of an EXECID becomes impractical and we have to rely on ExecuComp's reporting.	26,196	0.0203	0
<b>Percent Insider CEOs:</b> A variable constructed using <a href="#">Cremers and Grinstein (2013)</a> data about CEO hiring between 1993 and 2005 (annual frequency). It captures the percentage of new CEOs that were hired from inside the industry (using Fama-French 48-industry groups). Variable retrieved from <a href="#">Table 3</a> of their paper at the link: <a href="http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1108761">http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1108761</a>	25,576	68.1890	69
<b>Relative Pay Decile:</b> Each year all the CEOs in ExecuComp are ranked into deciles according to their total compensation (TDC1) level. The top decile shows the CEOs with the highest compensation. ExecuComp data is used.	26,041	5.4795	5
<b>Severance (SEV):</b> A dummy indicating whether a CEO has a job termination contract (or severance package) as shown in ExecuComp data. For this purpose we use the variable TERM_PYMT. We focus only on whether a CEO has such a package (i. e., if TERM_PYMT is positive value, then $SEV = 1$ ). If TERM_PYMT is zero, then $SEV$ is 0. If it is missing, we code $SEV$ as a missing value. We make one important adjustment. Since TERM_PYMT is unavailable prior to 2006, we assume that if a CEO (indicated by CO_PER_ROL) had a package in 2006, she also had one in prior years. This assumption is reasonable, since most severance packages are granted upon hiring date of the CEO. We therefore extrapolate 2006 values of $SEV$ dummy to the prior years for the same CEO (CO_PER_ROL must be the same). If a CEO never had any information about a severance package in any year after 2006, then $SEV$ is left as a missing value for the years prior to 2006. Data is from ExecuComp.	11,911	0.5691	1
<b>Switch Jobs:</b> An indicator variable that takes a value of one if during a given year the CEO is associated with a different firm than during the previous year, and zero otherwise. For this indicator to be equal to one, the executive has to hold the CEO title in her previous job, and her total pay in her current job has to be greater. Hand collected data and ExecuComp data is used. We do not consider the CEOs of financial and utilities firms. Our manually checked data has 73 cases of CEO job hopping cases from one public firm to another. In ExecuComp dataset there are hundreds of such cases of job hopping by a CEO (we identify 327 such incidences during our sampling period). However, a more rigorous manual check reveals that most of these cases appear to be a name change of a company due to a merger or simple GVKEY (and simple name change) of the original company ( <a href="#">Jenter and Kanaan (2015)</a> make similar choices when analyzing voluntary CEO turnover cases). We are able to identify and manually confirm (by reading the official announcements and the related news articles) 73 cases where the CEO actually engages in a job hopping while making sure her compensation is higher in the new job. In this number of job-hopping incidences, we include the following cases. 1) Clear job-hopping cases from a CEO of one public firm to a CEO of another. 2) In some instances we allow for a time gap between the quitting date of old job and starting date of the new job, if during that time the CEO was creating a startup or was engaging in active executive-level leadership in a private firm. Such cases are indication of a mobile CEO, because they suggest that this individual moved onto another active executive position and did not just quit her old job. 3) The old company was split up and/or one business segment is spun off into a	26,196	0.0028	0

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Panel B. Variables Related to CEO Mobility			
Variable. Definition.	N	Mean	Median
new publicly traded firm, and the old CEO chose to be the CEO of the newly spun off company. We consider such cases as a CEO making a choice of leading the spin off company and not staying with her old firm (the parent company). 4) A company merged with another firm, and the CEO left the newly merged firm to become a CEO of a completely different (third party) firm. Since the CEOs have power of deliberately sabotaging a merger, we consider the decision of such a CEO to move to a completely different company's leadership (and not block the merger) as a legitimate job change. 4) Finally, we also included the cases where a CEO quits her current job to become a non-CEO executive of another firm, and her compensation is higher in the new job. Such cases suggest that the CEO might have voluntarily moved onto another higher-paying executive job, even though she is not a CEO at the new firm.			
<b>Social Capital:</b> CEO's social capital is defined as the natural logarithm of one plus network size, $CEO\ Social\ Capital = \ln(1 + networksize)$ . Data is from BoardEx database.	7001	6.5994	6.7429
<b>Tenure:</b> Number of years since the CEO has been in his position. We use the variable BECAMECEO from ExecuComp data.	25,682	7.8287	6
Panel C. The Control Variables Used in the Risk-Mobility Regressions			
Variable. Definition.	N	Mean	Median
<b>Acquisitions:</b> The total acquisition spending of the firm during the year (AQC) scaled by total assets (AT). Data obtained from Compustat annual data.	66,947	0.0234	0
<b>Blockholders Percent:</b> The percentage of shares held by large shareholders (blockholders). A blockholder is defined as a shareholder that owns at least 5% of the company's shares. Data from 13F files.	25,017	0.1908	0.1746
<b>CEO Ownership:</b> Measures the fraction of the shares outstanding owned by CEO. Data is from 13F files.	24,672	0.0278	0.0039
<b>Delta:</b> Measures the change in the value of CEO's total (stocks plus options) portfolio due to a 1% increase in the price of the firm's common stock shares. We follow closely Coles et al. (2006)'s calculation of a CEO's delta and we use ExecuComp, CRSP, and Compustat data files.	21,754	709.45	204.32
<b>Independent Board Dummy:</b> A dummy that equals one if a firm's ratio of independent directors to the total number of directors is above the sample median, and zero otherwise. Data is from RiskMetrics Governance database.	15,976	0.4972	0
<b>Institutional Ownership:</b> Measures the fraction of the shares outstanding owned by institutional investors. Data from 13F files.	25,017	0.7078	0.7319
<b>Market-to-Book (MTB):</b> The market-to-book ratio is measured as the market value of equity (MVE) divided by the book value of equity (CEQ); data is from Compustat annual and CRSP monthly data.	24,670	3.3853	2.4088
<b>Net PPE:</b> Calculated as Net Property, Plant, and Equipment (PPENT) divided by total assets (AT). Compustat annual data is used.	25,553	0.2832	0.2250
<b>Proportion Independent Directors:</b> The ratio of independent directors divided by total number of directors. Data is from RiskMetrics Governance database.	15,976	0.6884	0.7143
<b>Return on Assets (ROA):</b> It is calculated as net income over total assets (NI / AT). Data is from Compustat annual files.	64,057	-0.0651	0.0315
<b>Sales Growth:</b> Calculated as (Sales) / (Lagged Sales) - 1. Data is from Compustat annual files.	25,456	0.1010	0.0840
<b>SEGN:</b> The number of business segments a firm operates with in a given year. Data is from Compustat Segment data (annually).	61,646	2.0228	1
<b>Size or Log(Sales):</b> Logarithm of firm's total sales (SALE). Data is from Compustat annual files.	62,824	5.0718	5.1248
<b>Vega:</b> Measures the change in the value of CEO's total option portfolio due to a 1% change in the annualized standard deviation of stock returns; We follow closely Coles et al. (2006)'s calculation of a CEO's vega and we use ExecuComp, CRSP, and Compustat data files.	22,742	114.40	42.716
<b>ZScore:</b> It is calculated as $ZScore = 3.3 * (OIADP/AT) + 1.2 * ((ACT - LCT)/AT) + (SALES/AT) + 0.6 * (MVE)/(DLC + DLTT) + 1.4 * (RE/AT)$ . OIADP is operating income after depreciation; ACT is total current assets; LCT is total current liabilities; and RE is retained earnings. The rest of the variables used in the equation are defined above. Annual Compustat data is used.	24,786	56.8350	4.1358

## Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jcorpfin.2021.102037>.

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