The Interactive Influence of External and Internal Governance on Risk Taking and Outcomes: The Importance of CEO Career Concerns

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ABSTRACT

We study the effects of multi-layered governance on firm risk by focusing on the interaction of two types of career concerns. Two Delaware court decisions, the validation of poison pill defenses (the Unitrin decision) implemented by staggered boards (the Wallace decision), reduced takeover-related career concerns. CEO age influences the response of Delaware firms to these shocks. Older CEOs in newly insulated firms reduce risk, while their younger counterparts *increase* risk. Ex-post, the differential behavior among young Delaware CEOs appears to be rewarded with abnormally positive stock performance and better future career outcomes. We conclude that there is important variation in the effects of governance on firm (CEO) behavior, driven by multiple facets of career concerns.

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The role of governance in corporate behavior is well-studied.[1] From investment to financing to compensation, the importance of both internal (e.g. boards) and external (e.g. stakeholders) governance is manifest.[2,3,4] Among the external factors that influence corporate behavior, the market for corporate control is a first order determinant. Low (2009) shows that it influences risk-taking, Bereskin and Cicero (2012) illustrate the effects on compensation policy, Israel (1991) and Billett (1996) highlight the effects on capital structure, Billett and Xue (2007) note its importance for payout policy.

More recently, the corporate governance literature has also begun to study the effects of CEO characteristics (e.g. Malmendier and Tate (2005, 2008)) on firm behavior. Among the individual traits considered, the CEO's age has received particular attention. Gibbons and Murphy (1992) find little variation in pay for performance across age. Dechow and Sloan (1991) find that CEOs in their final years manage discretionary investment expenditures to improve short-term earnings performance. Jenter and Lewellen (2011) show that CEOs reaching age 65 are more likely to receive a takeover bid, and that the bid premium tends to be lower. Chevalier and Ellison (1999) suggest that younger mutual fund managers wish to avoid unsystematic risk. Li, Low and Makhija (2011) find younger CEOs are more likely to enter new lines of business and exit existing lines. Serfling (2013) finds that lower risk firms *select* older CEOs and compensate them to discourage dramatic changes in risk.

Neither of these literatures (the work studying the influence of the takeover market, and the papers on CEO age effects) recognizes the influence of the other. This is particularly surprising as both the takeover market and the CEO's age are related through their influence on career concerns (e.g.

[1] See for example, Bebchuk and Weisbach (2010) and Coles and Li (2011) for reviews.

[2] Bertrand and Mullainathan (2003) and Giroud and Mueller (2010) conclude that poor governance associates with underinvestment. Harford, Mansi, and Maxwell (2008) and Billett, Garfinkel and Jiang (2011) suggest the opposite.

[3] Coles, Daniel and Naveen (2006) document two-way relationships between firm risk taking (via investment) and governance via pay structure. Bereskin and Cicero (2012) use shocks to the legal environment (the Unitrin and Wallace decisions in Delaware) to show that compensation policy is affected by external governance (takeover threats).

[4] Ovtchinnikov (2010) uses deregulatory shocks to conclude that the dynamic tradeoff theory of capital structure has empirical support.

Fama (1980)). Our paper seeks to fill this gap. Specifically, we study how both internal (CEO age) and external (takeover market) governance interact to influence the corporate behavior (outcome) of risk.

We begin by borrowing from Low (2009). She studies the influence of the Delaware Supreme Court's 1995 decisions that changed the previously takeover-friendly landscape to a more manager-friendly one (the Unitrin and Wallace decisions).[5] She shows that risk declined among Delaware firms in the wake of these decisions, particularly those with staggered boards. Her evidence is consistent with newly insulated managers reducing their risk in pursuit of the quiet life. We too study risk taking by CEOs (risk outcomes at firms) and how it changes around the Delaware shock. However as noted above, CEO age may affect the willingness of the manager to pursue a quiet life or something more aggressive or risky (Li, Low and Makhija (2011) and Serfling (2013)). Therefore, we ask whether the risk taking response to the Delaware court decisions varies by CEO age. Specifically, we use a differences-in-differences-in-differences (DDD) approach. We ask if risk is different for Delaware firms vs. non-Delaware firms, before vs. after 1995, for younger vs. older CEOs.

Our results are as follows. Career concerns of managers and their influence on firm risk are not uniform across CEO age, nor across takeover insulation. Younger CEOs of Delaware firms take significantly more risk, while their older counterparts take significantly less risk, after 1995. In other words, career concerns are many-faceted. Our evidence points to the influence of both the market for corporate control and the age of the CEO, with key interactions between the two, on risk taking. This is consistent with theoretical work suggesting younger CEOs are more sensitive to career concerns than older ones. But it also highlights the key role of the state of the takeover market for managerial behavior. In other words, governance is multi-faceted and both internal and external factors influence risk taking.

[5] Bereskin and Cicero (2012) also argue that both the Wallace decision and its precedent, the Unitrin decision, represent shocks to the corporate control landscape. In particular, while Wallace strengthened the "just say no" defense through the decision to uphold staggered boards, Unitrin expanded the circumstances when a poison pill would be allowed.

Confirming evidence of our main inferences is seen in cross-sectional sorts on firm-specific characteristics; CEO sensitivity of pay to risk (vega) and also sorts on board structure and corporate charter governance. Lower vega CEOs show a significantly more positive relation between young managers and firm risk post-regime change than higher vega CEOs. This suggests age mitigates paucity in the compensation incentives to take risk. Firms with better governance as measured by an absence of staggered boards and/or lower GIM index values show a more positive relation between young/Delaware and risk taking than other boards. When board structure-based governance is stronger, younger Delaware CEOs take on more risk than older ones in response to an insulating shock. Again, there is interaction between age-based and other forms of governance and we confirm causation between age and risk-taking.

We further show the interaction between external and internal governance by segmenting our samples based on whether the industry is dominated by younger or older CEOs. When at least 60% of the industry's firms have CEOs that are older, then younger CEOs actively differentiate themselves from the older ones by taking more risk after the Delaware decisions. By contrast, when at least 40% of the industry's firms have younger CEOs, the older ones do not reduce their risk after the shock and firms with younger CEOs do not take significantly higher risk than older CEOs. CEO age-based career concerns are importantly influenced by the nature of the industry (at least the typical CEO's age within it).

Finally, we link risk increases among young Delaware CEOs with outcomes that benefit them. They preside over significantly positive stock performance (Fama/French alphas) over the five years following the Delaware court decisions. They also enjoy a positive relationship between risk taking and executive employment by a new firm, if they depart the firm they presided over at the time of the shocks.

Overall, our results suggest important variation in governance's effects on risk taking. While pursuit of the "quiet life" may characterize the *average* CEO's behavior in the face of greater insulation

from the disciplinary effects of the takeover market (Low (2009)), the effect is nullified[6] among younger CEOs. The relationship is pronounced in industries where the majority of firms have older CEOs. And young Delaware CEOs benefit from increasing risk through both stock performance and future employment.

Our key contributions may be thought of as follows. First, our study of the interaction between takeover-related and age-based career concerns is new. It highlights that both external and internal governance matter for risk taking, and that they interact. We show that Low's (2009) evidence is incomplete – not all CEOs respond to corporate control insulating shocks the same way. Younger CEOs are dramatically different from the average in their risk taking. Serfling's (2013) evidence is also incomplete – not all younger CEOs take more risk. The nature of the industry is crucial, both in terms of its typical CEO age and in terms of its competitive stature (see below). And younger CEOs' risk-taking changes with the face of the corporate control market.

Second, our work is able to identify causal relationships between CEO age and corporate behavior by using an exogenous shock. The interaction between two facets of career concerns, corporate control considerations and CEO age, enables this. Thus, even if older (younger) CEOs select into firms wishing to pursue less (more) risky strategies, the Delaware court shocks should lead to *changes* in CEO risk taking (if age causes behavior) since risk-taking incentives have changed. Indeed, we find significant differences in the CEO age / firm behavior relationship among Delaware CEOs before and after the decision. Moreover, our DDD approach addresses a lingering endogeneity concern with Low (2009). Her evidence that Delaware CEOs' vegas change after the shock re-introduces the possibility of endogeneity in the measured risk outcome (because it's measured over the same window as the vega change). However, our further focus on the CEO's age, which is *not* influenced by the Delaware Court's decisions, re-establishes the validity of the exogenous shock approach to assigning causality.

[6] And apparently reversed.

Finally, we speak to the managerial labor market literature. We are the only paper to link risk increases that young Delaware CEOs presumably advocate, with outcomes that benefit them. They preside over significantly positive risk-adjusted returns over the five years following the Delaware decisions. They also enjoy a positive relationship between risk taking and appearance at a new employer.

The remainder of our research is organized as follows. Section I describes our data. We then present (in Section II) methods and results on the tripartite relation between age, insulation from the takeover market, and risk taking by CEOs. Section III shows heterogeneity in this relationship, highlighting where prior studies' inferences are overturned. Section IV presents evidence on the ex-post benefits (both for the CEO and shareholders) of increased risk taking after the shock. We offer conclusions in section V. Finally, in Appendix II, we offer some insight into the mechanisms by which CEOs may be effecting the change in risk associated with the Delaware shock.

I. Data

Our sample is constructed from multiple data sources. We begin with all firms covered in the ExecuComp database during the period 1993-2000. This is necessary to obtain key compensation statistics and we also use it to obtain the age of CEOs. Motivated by prior studies (Gibbons and Murphy, 1992; Chevalier and Ellison, 1999; Holmstrom, 1999), we consider CEO age as a main measure of CEO career concerns and present results by classifying CEOs 50 years of age or younger as young CEOs.[7] We follow Core and Guay (2002) when we calculate the sensitivity of CEO's stock and option value to a 1% change in stock price (delta) and the sensitivity of CEO's option value to a 1% change in stock return volatility (vega).

[7] Our results are robust to alternative thresholds, around the age of 50, for classification of young CEOs.

Our main data source for information on the firm's state of incorporation is the RiskMetrics (formerly IRRC) database, which covers S&P1500 firms and several large firms every two or three years since 1990. Since we employ a statewide natural experiment in all our tests, it is essential to correctly identify a firm's state of incorporation. Compustat however, displays a firm's state of incorporation only for the latest available year without information on the firm's past (strategic) reincorporation and therefore potentially introduces measurement error. The use of RiskMetrics' historical state of incorporation data helps us mitigate this.[8] We obtain stock return data from CRSP to construct our primary measure of firm-risk, daily stock return volatility, on a fiscal year basis. We require a firm has at least 60 days of stock returns data during each fiscal year that we use. We further stratify firm-risk into systematic risk and unsystematic risk by using the expanded market model, with the return on the CRSP value-weighted market index as the proxy for market return, and five leads and five lags of the market index return to allow for non-synchronicity (Dimson (1979)). Systematic risk is the variance of the predicted component of stock returns, and unsystematic risk is the variance of the residual returns from the market model. We then annualize the variances and apply a natural log transformation to them.

We collect financial statement data from Compustat to measure firms' investment and financing activities as control variables.[9] We measure firms' investment activities with capital expenditures (CAPX), research and development (XRD) each deflated by the beginning-of-year total assets. We measure disinvestment with asset sales (SPPE) scaled by total assets.[10] Book leverage components are short-term debt (DLC) and long-term debt (DLTT). Acquisition expenditures are drawn from SDC. We exclude firms operating in financial (SIC Codes 6000 -6999) and utility (SIC Codes 4400-4999) industries. We also exclude all firm-year observations for which the book value of assets are negative.

[8] Nevertheless, for firms with missing RiskMetrics state of incorporation data, we rely on Compustat. Our results are robust to using information on the state of incorporation drawn only from RiskMetrics.
[9] Our Appendix II examines corporate investment and financing behavior and its influence on risk taking.
[10] In our Appendix II tests below, we also recognize that the sale of assets can provide financing.

Our resulting sample consists of 5,961 firm-year observations. We winsorize all variables at the 1st and 99th percentile levels for each year to eliminate the effect of outliers. Our sample period starts at 1993 because ExecuComp data, which provides information on CEO age and compensation, are available from 1992 and our tests require CEO delta and vega in the preceding fiscal year end. We end our test period at 2000, five years from the Delaware decisions, because a longer post-event period could potentially be plagued by other economic events, and is also more likely to suffer from endogeneity concerns.

Table I contains descriptive statistics on our data. A few points are noteworthy. First, of all our observations, 8.6% of them have a young CEO (age 50 and under) of a Delaware firm, in the post-regime change environment. This compares with 40% of all observations being Delaware firms after the regime change, and 14.7% of observations that have a young CEO after the regime change, but not in a Delaware firm. The difference in percentage of CEOs that are young in Delaware vs. elsewhere (post-Wallace) highlights a benefit of our use of court decisions as an exogenous shock. A CEO's age may influence their incentive to select into a company based on takeover insulation. This type of selection or endogeneity must be addressed in order to reach conclusions about causality.[11]

Other information from Table I highlights the comparability of our data with that analyzed by Low (2009). For example, total risk (natural log of annualized variance of stock returns) is 7.3 for our sample and about 6.9 for Low's. Similar comparability is seen in the breakouts of systematic and unsystematic risks. We also note that our firms are generally high growth (like Low's) with average market-to-book ratio of 2.1 and similar average book leverage (about 23%). R&D expenditures relative to assets are about 3% while CAPEX relative to assets is about 7%. Finally, CEO average and median delta and vega are close across the two studies. Delta averages 635,000 dollars in changed stock and

[11] Moreover, if there's selection then knowing the history of states of incorporation also is important as firms may recognize the influence on CEO type they hire. This is an important benefit of using the historical state of incorporation data from RiskMetrics.

option portfolio value per 1% change in firm's stock price. Vega average 63,000 dollars in changed option holding value per 1% change in the firm's stock return volatility. Variable definitions may be found in Appendix I.

Table II presents correlations among variables used in our analyses. Young CEOs are associated with higher firm risk. The correlations between YOUNG and total (systematic) [unsystematic] are as high as 0.230 (0.158) [0.233]. We also find that young CEOs tend to engage in "a busy life." Young CEOs are positively associated with both investment (capital expenditure and research and development) and restructuring activity (sale of property, plant, and equipment). While this evidence is consistent with Li, Low, and Makhija (2011), it may be due to selection rather than active changes in behavior. Overall, correlation analyses suggest an important contribution from our natural experiment built around the 1995 Delaware court decisions.

II. Firm Risk, Regime Change, and CEO Age

As noted above, endogeneity complicates identification of a causal relationship between career concerns and risk-taking. Also, the implicit view of CEO age as sole determinant of career concerns' effects on firm behavior ignores the important and potentially interrelated influence of the market for corporate control on career concerns. Our empirical design overcomes both these issues.

A. Methodology

We assess the influence of CEO career concerns on firm risk via a differences-in-differences-in-differences (DDD) method. Bertrand and Mullainathan (2003) use DD to test the "quiet life" hypothesis, and Low (2009) explains risk changes due to the Wallace decision this way. We add another "layer" of differences in our estimation: CEO age. We offer two approaches to estimating DDD: differences in means after propensity-score-matching peers to treatment firms, and a regression framework.

A.1. Differences in Means

We conduct DDD tests using a propensity score-matching procedure *for two samples – young and old Delaware CEOs.* Our design follows Armstrong et al. (2010) and is implemented in several steps. First, we estimate two logits (separately) explaining the incidence of Delaware firms with young (old) CEOs vs. non-Delaware firms.[12] Second, we use the coefficients from the logit(s) to construct a propensity score match (PSM) for each Delaware firm and each non-Delaware firm. These are fitted values from the logit using the individual firm's regressor values. We then select one matching firm from the non-Delaware sample, that has the closest propensity score to our Delaware firm, as our peer firm. We do this separately for each "Delaware-young" and each "Delaware-old" treatment firm. For this matching we also require peer firms to come from the same industry as the treatment firm. Our matching firms appear to be well-chosen under standard PSM criteria.[13]

Once we have our peers, we compute average annual risk changes around the Delaware court decisions, separately for each treatment group (young and old Delaware CEO firms) and for each (of the two) peer group(s). Specifically, average pre-event risk is calculated over the available years preceding 1995 (1993 is the earliest we start – see above). Average post-event risk is calculated over the five years following the Delaware decisions (1996-2000). The change in risk is the post-event average minus the pre-event average. We then calculate the difference between the risk change for young Delaware CEOs and their PSM peers, and we do the same for the old Delaware CEO treatment group. These are DD tests. They measure for each treatment group (Delaware old and Delaware young), whether the Delaware firms associate with different risk changes over the Delaware court decisions than their non-Delaware peer firms. Last, we test for differences in these DD results across the young and old subsamples. In

[12] We include Size, MB, ROA, Sales Growth, Firm Focus, Number of Segments, and Firm Age as regressors.

[13] To assess covariate balance, we conduct t-tests of the difference in means for each variable, between each treatment group and its own matched sample. In untabulated results, we find that only 2 out of the 7 t-tests (Size, ROA) are significant between Delaware young firms and its matched sample. We also find that only 1 out of 7 t-tests (SALEGROWTH) is significant between Delaware old firms and the matched sample.

other words, the triple-difference compares the difference-in-differences treatment effect in one group (young CEOs) to the difference-in-differences treatment effect of another group (older CEOs).

A propensity score-matching approach does not assume that the relations between dependent variables and independent variables (including control variables) are homogenous across the treatment and control samples (Armstrong et al., 2010). Nor does it assume that the relations between dependent variables and independent variables are linear. However, propensity-score matching is not without possible tradeoffs. It assumes that any factors that are not included as determinants of the outcomes in the first-stage propensity model, are random between the treatment and control groups and do not affect the outcomes of interest. In our context, this assumption is violated *only if* firms that are expected to change risk choose their state of incorporation and simultaneously decide what type of CEO to hire (i.e., young versus old). Given that the Delaware court decisions are largely exogenous (i.e. unanticipated), we believe that this possibility is remote.

A.2. A regression framework

The alternative approach to DD tests in means is a regression framework. This allows for controls explaining differences in the dependent variable that may not be appropriate to include in a PSM. We therefore estimate the following model:

$$y_{jt} = \alpha_t + \gamma_s + \delta_i + \beta \boldsymbol{X}_{jt} + \theta DEL_j * AFT_t + \varphi DEL_J * AFT_t * YOUNG_{jt} + \varepsilon_{jt} \quad (1)$$

In the equation, j indexes firms, t indexes years, i indexes industries, and s indexes states. The dependent variable y_{it} is firm risk, measured as the natural log of annualized variance of daily stock returns over the fiscal year (or in further tests, the systematic or unsystematic portion of risk). DEL is a dummy variable for Delaware-incorporated firms. AFT is a dummy variable for years after 1995 (the Delaware court decisions). YOUNG is a dummy equal to one if the CEO is 50 or younger. The regression is run over our full sample period 1993 through 2000. We cluster at the state level (see Yun (2009), Bertrand, Duflo, and Mullainathan (2004)). We eschew years of analysis beyond 2000 because of

possible macro changes in much later years following the regime change. ***X*** includes our set of controls, typical to the literatures examining CEO incentives and firm behaviors and risk-taking. Again, variable definitions are provided in Appendix I.

In equation (1), the coefficients θ and φ are of primary interest. θ measures the change in risk due to the regime shift, among older CEOs of Delaware-incorporated firms. Under the "quiet life" hypothesis, we expect the coefficient on this to be significantly negative. Increased insulation from the market for corporate control (due to the Delaware court decisions) reduces the opportunity cost of managerial shirking.

By contrast, the coefficient φ is expected to be significantly positive. Following Holmstrom and Ricart i Costa (1986) and Hirshleifer (1993), younger managers are more sensitive to the effects of reputation on their perceived value and they seek to differentiate themselves from older managers. Among Delaware CEOs, avoidance of the "quiet life" is one way to make this difference evident.

B. Results

B.1. Differences in means

Our results from the DDD in means tests are presented in Table III. Panel A shows the effects of the Delaware decisions treatment on risk taking for young CEOs. Among them in Delaware firms, risk increases post-shock. For total, systematic and unsystematic risk, the mean differences in natural logs of volatility (from before to after the shocks) are .366, .577, and .327 respectively. These compare with mean changes among their PSM peers of .232, .435, and .207 respectively. The DD estimator (difference in time-series changes between treatment and non-treatment firms) is significant at the 10% level for all three risk measures. The shock to takeover-related career concerns (the increase in insulation due to the Delaware court decisions) causes *more* risk-taking by young Delaware CEOs.

Next, Panel B documents the effects of Wallace for *older* Delaware CEOs. The change in risk for them is significantly *smaller* than the change in risk for their PSM peers. The evidence is consistent with Low (2009), suggesting the Delaware court decisions' insulation encourages pursuit of "the quiet life". However, the results in Panel A dispute this for a key subsample.

Finally, Panel C formally tests whether the apparent difference between younger and older Delaware CEOs' risk-taking response to the Delaware court decisions is significant. It is. The DDD estimates are all significantly positive. We conclude that age- and takeover-based career concern changes *cause* risk changes; it is not simply selection. Moreover, our results highlight an important interaction between two different facets of career concerns (takeover-related and age-based).

We assess the robustness of our DDD in means results to two changes. First, we "lock" our classification of young Delaware CEOs on the basis of their age in 1995 (the year of the Delaware court decisions). This has very little effect on our results[14] and does not change our conclusions. Second, we restrict our analysis period to 1993-1998. This focuses attention on the very few years around the decision and limits possible macro changes that might be more likely over a wider window. Again, there is very little effect on our results and our conclusions do not change.

B.2. Regression

Table IV presents results from estimating specification (1). There are three models in the table. The first assesses total risk (natural log of daily variance of stock returns) as the dependent variable. The next two columns break out risk into systematic and unsystematic components respectively.

Beginning with model one, our results are consistent with expectations. The coefficient θ, measuring the influence of the regime change on firm risk among older Delaware CEO firms, is significantly negative. There is evidence to support the "quiet life" hypothesis. This result is not new. Low (2009) highlights it and this result is very much like hers.

[14] If anything, they appear slightly stronger than in Table III.

However, the model one results also show evidence consistent with age-based career concerns being paramount among younger CEOs, in a way that influences their risk taking response to changes in insulation. The coefficient φ is significantly positive. Compared to older CEOs, younger ones in Delaware firms after the regime change, preside over significantly higher risk. Younger, recently more insulated CEOs behave as if there is a new opportunity for them to differentiate themselves from local peers. Importantly, the sum of the coefficients θ and φ is significantly positive, with a p-value of 1%. Not only do younger (Delaware) CEOs preside over significantly different firm risk after the Delaware court decisions, but they even take on significantly more risk than they did prior to the decision. This indicates that age-based career concerns *are not uniform* across variations in other determinants of career concerns. Work that does not recognize this is potentially contaminated by endogeneity and our use of the court decisions as a natural experiment breaks that endogenous link. Age-based career concerns vary with the state of the takeover market. This interaction is key to our ability to make statements about causality. The shock to the state of the takeover market in Delaware breaks the endogenous link between multiple facets of CEO career concerns (age- and takeover-related). Our results strongly suggest that younger Delaware CEOs view the regime change as an opportunity to distinguish themselves that was previously unavailable, through their risk taking.

The coefficients on several control variables are also noteworthy. The variable "YOUNG" (by itself) also carries a significantly positive coefficient, as does the variable "AFT" (by itself). The former is consistent with either selection or causality, wherein younger CEOs are associated with greater firm risk. The latter is consistent with a general rise in firm risk from the early 1990s to the late 1990s (e.g. Schwert (2002)). Other control variables carry coefficients very similar to those found in Low (2009).

The results from disaggregating total risk into systematic and unsystematic proportions are shown in models 2 and 3. For systematic risk changes, we see that they are marginally different among older Delaware CEOs after the regime shift with a p-value of 0.1, and the coefficient (θ) is negative. Still,

younger Delaware CEOs preside over more systematic risk than their older counterparts after the regime shift, with φ significantly positive. The sum of θ and φ is also significantly positive – younger Delaware CEOs actually raise their systematic risk after the regime change. The results for unsystematic risk are much closer to those for total risk, with both θ and φ significantly negative and positive respectively, and coefficients very close in magnitude to those in the total risk regressions. The takeaway from this is that older Delaware CEOs appear to react to the regime change by adjusting their unsystematic risk more than systematic risk while younger Delaware CEOs adjust both.

III. Heterogeneity in the Treatment Effect

The results thus far suggest that two facets of CEO career concerns (age and takeover threats) are key determinants of firm risk. Here, we further segment our analysis by likely candidates for the importance of career concerns to risk taking. We present results for two levels of segmentation; firm-specific and industry-based. Table V, Panel A analyzes the influence of age and takeover related career concerns on risk for sub-samples that differentiate by other firm-level incentive determinants. We specifically create sub-samples of staggered and non-staggered board firms, high and low CEO vega firms, and high/low GIM (or G-Index, see Gompers, Ishii and Metrick (2003)) firms. Table V, Panel B repeats the analysis but segments on industry-level factors likely to influence the risk taking response to age and takeover related career concerns. Specifically, we disaggregate our analysis based on the typical age of CEOs within the industry and we also analyze the effects of industry competitiveness on our results. We continue with equation (1) for our regression specification. The key coefficients of interest are θ and φ.

A. Firm-specific heterogeneity in the treatment effect

We first segment our analysis and tests according to whether the firm has a staggered board or not. Low (2009) emphasizes the importance of Wallace by highlighting the stronger deterrent effect on risk taking among firms with staggered boards. In other words, the Wallace decision made it more difficult to remove a poison pill (which was allowed under Unitrin) through board replacement, simply because of the time it takes to do so. Given that it takes time to dramatically change the structure of a board when it is staggered, there may be differences in the risk-taking changes that younger CEOs (who may wish to do so) can accomplish after the shock.

We first confirm Low's (2009) result – the risk deterring effect of greater takeover insulation (negative coefficient θ) – is restricted to the staggered board sub-sample. Turning to the interactive effects of CEO age and takeover insulation on risk, our tests reveal (at best) weak differences between groups of staggered board firms or not. When the sample is comprised of staggered board firms, the coefficient φ (0.141) is significantly positive at the 10% level. Staggered board firms with young CEOs see risk increase marginally more after the shock. When the sample is of firms without staggered boards, the coefficient φ (0.260) is significantly positive at the 1% level and nearly twice the economic magnitude than in the staggered board sample. However, the F-test for differences across the samples' coefficients is not significant (p-value = 0.29). We infer that without a staggered board, younger CEOs are less encumbered if they attempt to increase risk in response to the regime shift. When there is a staggered board, some younger CEOs may find it more difficult to significantly alter risk even if they wish to.

We next analyze whether CEO vega, measuring pay-based incentives, influences the relation between takeover and age-based career concerns and risk. First, the coefficient θ is significantly negative among low vega firms, but insignificant among high vega firms. When pay-based incentives to take risk are low, older CEOs respond to the insulating effects of Delaware's court decisions by taking

even less risk. By contrast, younger CEOs *increase* their risk in response to the shock. The coefficient φ is significantly positive in the low vega (first tercile) sub-sample, as is the sum of θ and φ. Since low vega suggests weak risk-taking incentives from compensation, this suggests substitution of incentives due to career concerns for incentives due to pay. Precisely where incentives are low for one reason, career concerns provide an alternative incentive to take risk. Moreover, this is reliably different from the value of φ in the high vega sample.

Finally, we examine two sub-samples based on the GIM proxy for good/poor governance associated with the corporate charter. Specifically, we classify low (high) GIM firms as those in the lowest (highest) tercile of G-Index values in each year.[15] When GIM is low, governance is generally viewed as shareholder-friendly – there are fewer anti-takeover provisions. For this sub-sample, the coefficient φ is significantly positive with 90% confidence. When GIM is high (more anti-takeover oriented), the coefficient φ is negative but insignificant. The difference between the two φ's is significant (p=.07). Younger CEOs in good governance firms take on more risk in response to the shock than their counterparts in poor governance firms, and they take on more risk than their older counterparts in good governance firms. Also among poorer governance firms, the coefficient θ is significantly negative. This suggests that poor governance exacerbates quiet life incentives when there is an insulating shock and CEOs are older.

Overall, firm characteristics appear to influence the causal effects of age and takeover related career concerns on risk taking. These results also highlight the importance of recognizing the interaction between different governance elements. However, firms do not operate in a vacuum and industry characteristics may matter as well. We now turn to industry-level heterogeneity analysis.

[15] In years without G-Index values, we follow Gompers, Ishii, and Metrick (2003) and use the prior available value. Also, our results are robust if we lock each firm's GIM at its 1995 value.

B. Industry-level heterogeneity in treatment effect

We examine two types of industry variation that may influence the relation between risk taking and age and takeover related career concerns. First, we study whether industry concentration (HHI) influences the risk-career concerns relation. We classify firms as having high or low HHI as follows. We begin by cutting the Compustat universe into terciles of HHI. If the industry of one of our sample firms has an HHI that falls in the third tercile based on the Compustat ranking, it is classified as a high concentration (low competition) industry's firm. We place firms that belong to industries with HHI in the lowest Compustat tercile of HHIs, into the low concentration (high competition) group.[16] Since our own sample is not the entire Compustat universe (it's based on the Execucomp sample), we do not necessarily need to have similar numbers of observations in the low and high concentration sub-samples. Indeed, only 625 of our sample observations are placed in the high concentration tercile, while 4,018 sample observations are placed in the low concentration tercile.

Running the equation (1) regression (separately) on the low and high concentration sub-samples provides interesting results. When concentration is low (competition is high), our typical result prevails; older CEOs pursue the quiet life more after the shock (θ is significantly negative) while younger CEOs increase their risk, both relative to older CEOs (φ is significantly positive) and over their prior level (the sum of θ and φ is significantly positive). Greater competition does not deter older CEOs from pursuing the quiet life, perhaps because they feel so insulated by the shocks (and also age related career concerns are less pronounced). On the other hand, more competition mitigates the incentive of younger CEOs to pursue the quiet life (driven by the shock) perhaps because they recognize the potential cost of eschewing risk in the face of stiff competition – it may lead to poorer industry-adjusted performance and worse career prospects.

[16] Our main result (the insignificant coefficient φ in the low competition sub-sample) is robust to grouping firms into competitiveness samples based on whether the industry HHI is above/below the median on Compustat.

When concentration is high (competition is low), the inferences are somewhat different. Though we still see quiet life incentives prevailing among older CEOs (θ is negative), we see similar behavior among younger CEOs (φ is insignificant). The opportunity cost of risk avoidance among younger CEOs is lower if their insulation from the takeover market is not compromised by a competitive product market.

We next segment our sample based on the proportion of young CEOs in the sample firm's industry. If there's a significant portion of firms with young CEOs in an industry, even the older CEOs may experience age related career concerns (due to their peers' actions). We classify industries with at least 40% of firms led by young CEOs as "young CEO industries", and conduct our tests separately on this sample and its corollary.[17] We find that older CEOs indeed react differently to the insulating shock when there's a significant proportion of young CEOs (40% or more) in the industry. The older CEOs do not reduce their risk ex-post. Thus age-related career concerns change the inferences from Low (2009) that CEOs reduce risk in response to insulating shocks, but this happens both directly and indirectly. Younger CEOs behave differently than older ones, and older CEOs behave differently when the industry is comprised of at least 40% young CEOs.

Our other results remain. Younger CEOs increase risk more than older CEOs in both sub-samples. Older CEOs significantly reduce risk in response to the insulating shock (just as Low (2009) finds) in the sub-sample where less than 40% of the industry's CEOs are young. Overall, our results reinforce the interactive nature of multi-layered governance effects.

[17] If we require that a majority of CEOs in the industry be young for the industry to be so classified, the sample size shrinks precipitously (to N=275 vs. N=1,042 in our current categorization). Nevertheless, our main inferences persist.

C. Revisiting the prior literatures on age and takeover related career concerns and risk taking

Our evidence calls into question inferences regarding the effects of both age and corporate control considerations on risk taking by CEOs. Low's (2009) evidence regarding the effects on risk of shocks to insulation (from corporate control considerations), does not hold for younger CEOs. Our results also appear inconsistent with Serfling's (2013) inferences regarding age's effect on risk, when we sample on less competitive industries, or poorly governed (high GIM) firms, or firms where the CEO has other strong risk-taking incentives (pay – the high vega sample). To confirm these differences, especially those that question Serfling (2013) who does not examine exogenous shocks, we turn to panel regressions.

Table VI presents regression results examining the influence of CEO age on risk (as Serfling (2013) does). However, we examine this relation for sub-samples of high and low GIM firms, and also for sub-samples of high and low competition industries (firms that belong to them). The coefficient on CEO age should be negative (younger CEOs take more risk) if Serfling's (2013) inferences persist. Indeed we see this for some sub-samples; strong governance (low GIM) firms and firms from more competitive industries. However, the effects of age on risk taking are substantially weaker and indeed insignificant among poorly governed (high GIM) firms and among firms that operate in less competitive industries. Not only is the statistical significance smaller, the coefficients indicate much smaller economic effects. Overall, these results confirm the importance of recognizing multi-faceted elements of governance (internal – age, and external – corporate control) for risk taking.

IV. Risk Taking by Young CEOs and ex-post Benefits

Our focus on career concerns' effects on risk-taking presumes that CEOs care about their future career prospects. Here we directly examine the tripartite relation between CEO risk taking, age and future career outcomes. In particular, we seek to answer the following question that the literature on

career concerns and differential CEO behavior has not yet answered: do these career-motivated differential actions benefit either the CEO or the firm's shareholders or both? This section addresses the question of benefits to differentiation and it represents one of our key contributions to the literature on career concerns.

We address ex-post benefits to young CEO differentiation in two ways. First, we investigate the next step on young Delaware CEOs' career paths when they departed the ex-ante firm after the shocks. In this analysis, we focus on the influence of firm risk prior to the young CEO's departure, on their ex-post employment status. In our second analysis, we investigate the long-run stock performance of Delaware firms in the five years following the court decisions.

A. Subsequent Employment

Our analysis of ex-post employment situations focuses on young Delaware CEOs who depart their employer post-shocks. In Panel A of Table VII we describe their stated reasons for departure. [18] There are 79 CEOs who depart their pre-shocks firm. By far, the most common reason given is resignation with nearly 40% of the observations. Forced departure and pursuit of other opportunities are the next most common reasons with roughly 25% each. Least common are the control and retire reasons, each near 5%.

What's more important in our view is the employment outcome post-departure. Panel B shows that nearly 60% gain new employment as an executive at a different firm. Moreover, of the 40% that don't, some are due to retirements. In other words, a clear majority of young CEOs that depart, subsequently find employment as an executive. Moreover, for those that are re-employed as executives, over 60% of them are CEOs again.

[18] We use the methodology of Fee and Hadlock (2004) to classify "reasons for departure".

We further break down the ex-post employment situation by reason for departure (Panel B). For those that became CEOs at the new firm, 21% were forced out of the old firm and 21% pursued other opportunities. However, the most common departure reason among those CEOs that obtain CEO positions at new firms is resignation. We also see that the most common departure reason given for those that don't take a CEO position at the new firm (but do take an executive position) is to pursue other opportunities.

To ascertain the influence of risk-taking (at the old firm) on subsequent employment outcomes of young Delaware CEOs post-shock, we run logit regressions (Panel C). The dependent variable equals one if they find employment as an executive ex-post. The key regressor is risk, measured as the average of annual measures of stock volatility over the fiscal years between 1995 and the CEO's departure of the "old" firm. Control variables include reasons for departure dummies and firm performance.

The coefficient on firm risk is significantly positive with a p-value below .01. When a young Delaware CEO departs their firm, their risk-taking while at the "old" firm positively influences the chances of new employment as an executive later on. This is a personal benefit to risk-taking by young Delaware CEOs.

B. Long-run Stock Performance

We assess firm performance over the five years following the shocks using the Fama and French (1993) methodology. We form separate portfolios for young and older Delaware CEO firms. Portfolio returns are calculated using both value-weighting and equal-weighting and we report these results separately in Table VIII. Panel A employs the standard 3-factor Fama/French model. Panel B reports results from the 4-factor model that includes a momentum factor. We report the intercepts and associated t-statistics.

The results in Panel A indicate outperformance by firms with younger Delaware CEOs in the five years following 1995 decision. Under value-weighting, the outperformance is by 71 bps per month, significantly different from zero with 90% confidence. Under equal-weighting, outperformance is nearly 2% per month, significant at the 1% level. Younger Delaware CEOs, who on average increase risk post-1995 (see Tables III and IV), outperform the benchmark during that same time window. The career concerns-encouraged risk taking benefits the firm's shareholders through superior risk-adjusted performance.

Panel B presents similar results, though a bit weaker. The intercept in the value-weighted portfolios regression is only 50 bps for younger Delaware CEOs, and not statistically significant. However, the equal-weighted portfolio regression results continue to indicate significant risk-adjusted outperformance.

One of the concerns with the results in Table VIII is that all intercepts appear positive with most of them significant. However, this appears to be due to sample selection. For the full CRSP sample over the same time period (five years post-1995), we re-run the Fama/French regressions and find negligible intercepts (negative under equal-weighting) with t-statistics less than one. Overall, the greater risk-taking by younger Delaware CEOs post-1995 appears to be rewarded.

V. Conclusions

We study the interactive influence of takeover related and age-based career concerns on firm/CEO risk taking. We use the Unitrin and Wallace decisions of the Delaware Supreme Court (in 1995) that effectively insulated CEOs from the corporate takeover market, as an exogenous shock. We also exploit the exogeneity of CEO age at the time of the shock. Our results highlight the importance of recognizing multi-layered governance effects on risk taking.

We find that the Delaware shock caused reduced risk-taking by older CEOs but increased risk-taking by younger CEOs. These results are pronounced among low vega CEOs and firms with good governance. They are less evident when industry competitiveness is low and when a significant proportion of the industry's CEOs are young. This heterogeneity further argues for recognizing the multi-layered nature of governance and its influence on risk-taking.

If career concerns drive younger managers to get noticed, we would expect those that act upon such concerns to be rewarded ex-post. Indeed we find that young Delaware CEOs who leave their "old" firm post-Wallace very often appear at another firm as an executive and often as a CEO. Moreover, the higher their risk-taking was, the greater the likelihood that they take an executive position at a new firm. Finally, younger Delaware CEOs outperform the benchmark (Fama/French) in the five years following 1995 (the shock year). Career concern-motivated risk-taking appears to benefit shareholders too.

Overall, our results are the first to suggest important interactions between takeover related and age-based career concerns. The effect of takeover insulation on risk taking is influenced by CEO age, while younger CEOs' risk taking varies by the level of takeover likelihood. Finally, we offer evidence that more strongly suggests CEOs cause risk taking, rather than the relationship reflecting selection.

Appendix I: Variable Definitions

CEO age =	CEO's age during the sample year (from ExecuComp)
DEL =	A dummy equal to one if the firm is incorporated in Delaware, in which state incorporation data comes from RiskMetrics. For firms missing state of incorporation data on RiskMetrics, we use Compustat state of incorporation data
AFT =	A dummy equal to one if the firm-year observation is during the period 1996-2000
YOUNG =	A dummy variable equal to one if the CEO is 50 years old or younger as of the sample year
Firm age =	The sample year minus the year in which the firm was first listed on CRSP
Total risk =	The natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year
Systematic risk =	The natural logarithm of the annualized variance of the predicted component of stock returns using the expanded market model as described in Section II
Unsystematic risk =	The natural logarithm of the annualized variance of the residual returns from the market model
Size =	The natural logarithm of total assets (AT) measured in the prior fiscal year end
MB =	The ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end
ROA =	The ratio of net income (IB) to total assets (AT) in the prior fiscal year end
CEO delta =	The sensitivity of CEO's stock and option value to a 1% change in stock price in the prior fiscal year end
CEO vega =	The sensitivity of CEO's option value to a 1% change in stock return volatility in the prior fiscal year end
Sales growth =	The current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales
Firm focus =	The segment sales based Herfindahl index computed as the sum of squared segment sales-total segment sales ratios
Number of segments =	The firm's number of business segments from the Compustat Segment Database
Capital expenditure =	The ratio of capital expenditure (CAPX) to total assets (AT)
Sale of PPE =	The ratio of sale of property, plant, and equipment (SPPE) to total assets (AT) (If SPPE is missing, it is set equal to zero)
R&D =	The ratio of research and development expenditure (XRD) to total assets (AT) (If R&D is missing, it is set equal to zero)
Book leverage =	The sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT)
Total acquisition exp. =	The sum of acquisitions deal values (from SDC) during the fiscal year

Appendix II: Changes in Corporate Investment and Financing Behavior

In this appendix, we offer analysis that links corporate investment and financing decisions with the increases in risk we document among younger CEOs after the Delaware shock. Much of the corporate behavior we analyze has been examined elsewhere, but none of the prior work takes our view of interactive effects of age and takeover related career concerns.

A. Firm Investment, Financing, Regime Change and CEO Age

This section investigates the influence of multi-faceted career concerns on firm investment and financing behavior. It affirms the results in Li, Low and Makhija (2011). However, it also highlights the interaction between age-based and takeover-based career concerns, and offers causality evidence. Finally, it provides context for our next analysis on whether the relation between career concerns and changes in investment and financing behavior influence risk.

Similar to the analysis in section II, we estimate DDD regressions to identify the effect of regime shift, Delaware incorporation, and CEO age on a decision variable. Here, the dependent variables reflect firm investment and financing decisions. Specifically, we analyze capital expenditures, asset sales, research and development, book leverage and acquisition expenditures. All variables are defined in the Appendix I above.

Table A.I contains our results from explaining CAPEX, SPPE, R&D, book leverage and acquisition expenditures on controls and our key variables. The specification is like that in equation (1), but with different dependent variables.

Our first analysis is of capital expenditures. Hirshleifer (1993) notes that reputational concerns can affect both attitudes towards risk and which projects are undertaken (among other things). We have already seen that one proxy for reputation concerns (CEO age) interacts with takeover-related concerns to affect firm risk, and we now present evidence that it also affects investment. In our

standard regression, the coefficient on DEL*AFT*YOUNG (φ) is significantly positive. Younger Delaware managers increase capital expenditures more than older ones after the Wallace decision. Again, the exogenous shock allows us to make a causal statement. Career concerns lead to changes in investment behavior among younger CEOs. There is no real change in older Delaware managers' investment behavior after the decision. To measure the total change in investment behavior by younger Delaware managers, we sum θ and φ. The sum of the coefficients is significantly positive. These results are consistent with Li, Low and Makhija (2011).

We next study disinvestment behavior – the sale of property, plant, and equipment (SPPE). Bertrand and Mullainathan (2003) highlight the reduction in old plant closure activity as managers pursue the quiet life when governance is weak. In line with this, we expect θ to be negative. Indeed it is, but not significant at conventional levels. We also expect φ to be positive. It is, but as with θ, it is not significant. Our SPPE regression results are rather inconsistent with Li, Low and Makhija (2011). They document a negative correlation between firm age and plant exit. Again, endogeneity/selection may be behind their results. Firms planning to close plants may select younger managers.

We analyze investment in research and development in model 3. We document no significant difference between younger and older Delaware managers' R&D expenditures after the regime change. Moreover, older Delaware CEOs also don't change their R&D spending in response to the decision. Career concerns driven by regime change and age do not appear to influence CEOs' R&D level choices. This highlights a difficulty with interpreting the evidence in Serfling (2012) as causal. His results are consistent with selection and it is difficult to claim (particularly in light of our results) that age-based career concerns encourage R&D expenditures.

In model 4 we examine change in financing, studying book leverage and the influence of CEO age, Delaware incorporation and regime change. The coefficient φ is significantly positive. Younger Delaware CEOs use more leverage than their older counterparts following the regime change. Moreover,

given the insignificance of θ (sensitivity of older Delaware CEOs' leverage to the regime change), the sum of θ and φ is significantly positive. Younger Delaware CEOs actually increase leverage in response to the Delaware court decisions. They adjust their financing in a manner consistent with an intent to increase risk. This evidence is somewhat different from that in Serfling (2012). In only one specification (of three), does he show a negative correlation between age and leverage. Endogeneity concerns may again explain the difference between our results.

Finally, there is little evidence to suggest significant differences between older and younger Delaware CEOs in acquisition behavior changes due to the regime shift. The coefficients θ and φ are both insignificant. Overall, the evidence in Table A.I indicates that changes in some investment behavior (CAPEX) and financing (book leverage) are different for older and younger Delaware CEOs.

B. Career Concerns, Firm Investment, and Firm Risk

Given robust evidence of the influence of career concerns on risk taking as well as investment and financing behavior, we now examine possible links between these. We therefore introduce a new empirical model, though it is similar to that in equation (1). We include several further interactives to capture the influence of investment on risk changes and how they might differ due to the dual facets of career concerns: regime change and CEO age. We capture the potential influence of financing on the relationship by forming sub-samples based on financing behavior of the firms. The model is as follows:

$$y_{jt} = \alpha_t + \gamma_s + \delta_i + \beta \boldsymbol{X}_{jt} + \theta DEL_j * AFT_t + \varphi_1 DEL_J * AFT_t * YOUNG_{jt} + \varphi_2 DEL_J * AFT_t * YOUNG_{jt} * INVEST_{jt} + \varepsilon_{jt} \quad (2)$$

In equation (2), the coefficient of interest is φ_2. A positive coefficient would indicate that younger Delaware CEOs take on more risk *via* their new investment policy on either capital expenditures or R&D than their older counterparts, after the regime change. Our results are presented in Table A.II. Given space constraints, we only report the coefficient φ_2 and its p-value. There are two panels of results (A and B) in Table A.II, studying respectively the influence of CAPEX and R&D on risk. The first

row of results in each panel is for the full sample. Later rows present (φ_2) coefficients for sub-samples based on asset sale activity information and financing behavior by firms.

B.1. Full Sample Results

The first row of results in Panel A of Table A.II indicates a marginal difference between older and younger Delaware CEOs' use of CAPEX to influence the systematic portion of firm risk after the regime change. The coefficient φ_2 is positive with a p-value of 8%. The apparent increase in CAPEX by younger Delaware CEOs relative to older Delaware CEOs (in response to the regime change) appears to at least partially drive the observed change in firm systematic risk documented in Tables III and IV. On the other hand, there is little evidence to suggest capital expenditures influence the change in unsystematic risk also documented in Tables III and IV.

The first row of results in Panel B of Table A.II indicates a *negative* effect of R&D spending on risk for younger versus older Delaware CEOs. The coefficient φ_2 is -2.08 with a p-value < .01. This is a surprising result in light of Berk, Green and Naik (1999) and others suggesting R&D raises risk. However, as we note below, these average results are driven by certain sub-samples, and other groups show the opposite effect. Finally, in untabulated results, acquisition expenditures do not significantly influence risk taking differences between younger and older Delaware CEOs.[19] Overall, the influence of investment on risk variation is weak on average. In the case of R&D, it is surprisingly in the opposite direction from the results shown in Tables III and IV. Below, we investigate sub-samples with an eye to explain these results.

B.2. Sub-sample results

We next segment our sample into firm/years with positive asset sales (SPPE > 0) or otherwise, and within these segments, into four groups based on financing behavior. The financing sub-samples we investigate are capital raisers (net debt and net equity both increase), capital reducers (both decrease),

[19] Notably, this seems inconsistent with Serfling (2012), again highlighting potential endogeneity concerns with his work.

leverage increasers (net debt rises and net equity declines), and leverage reducers (net debt declines and net equity rises). Below, we particularly emphasize asset sellers (SPPE > 0) that raise capital. These are firms that are raising resources and we are interested in how they deploy those resources in their investment behavior (CAPEX and R&D).

Returning to Panel A of Table A.II, the positive influence of CAPEX on systematic risk among younger Delaware CEOs after the court decisions is attributable to the non-asset selling group. Within this group, both capital raisers and capital reducers, as well as leverage reducers, carry a positive coefficient φ_2 with a p-value less than 0.1. While these results partially support Li, Low and Makhija (2011) because CAPEX increases risk (suggesting bold actions designed to get CEOs noticed), we also note the lack of asset selling activity. These are not the firms Li, Low and Makhija highlight as selling plants to get noticed.

In Panel B, we see that the negative influence of R&D on risk for young Delaware CEOs after the shock is driven by the sub-sample of non-asset sellers. Within this group, we again see the importance of the capital raisers and reducers. However, firms that clearly change their leverage (raise or reduce it) do not exhibit a significant influence of R&D on risk. Although the leverage increasing firms carry an ostensibly negative coefficient (φ_2), it is a noisy estimate and not significant.

The third result we emphasize in Table A.II also comes from Panel B. Among firms that sell assets, those that also raise capital are almost certainly gathering liquid resources.[20] For these firms, the coefficient φ_2 is positive and significant. R&D use increases risk for young Delaware CEOs after the shock, when more resources are actively generated and deployed in risky activities.

Overall, firms' investment behavior influences their risk conditional on whether they are selling assets and raising capital. Notably, asset sellers that are raising both debt and equity capital, use their R&D spending to increase their risk.

[20] Assuming they are not using proceeds from asset sales to pay down debt. This would be surprising in light of their net debt (and equity) issuance is positive.

Taken together, our Appendix II results suggest that career concerns influence corporate investment and financing behavior and this plays a conditional role in risk changes. Younger CEOs of Delaware firms invest more (CAPEX) after the regime change than older CEOs of Delaware firms. They also take on more (book) leverage relative to older CEOs of Delaware firms. These results are consistent with younger CEOs having different career concerns and using investment and financing behavior to influence the labor market's perception of them after the disciplining effects of takeovers are mitigated in Delaware. Moreover, there is important variation in the cross-behavior relationships between (dis)investment, financing, and risk taking, and how they're influenced by career concerns.

Specifically, we find that a sub-sample of young Delaware CEOs is very aggressive in their risk-taking behavior. Those that sell assets and (in the same year) raise external finance, use these resources to invest in R&D that associates with significantly higher risk than older Delaware CEOs after the shock. Notably, there is no other evidence of increased risk taking through either other investment behavior or even financing behavior, among young Delaware CEO firms. We conclude that redeployment of new liquid resources is a crucial element of risk-taking through investment behavior, by CEOs with career concerns.

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Table I

Descriptive statistics.

This table presents descriptive statistics for the sample. The data set comprises 5,961 firm-year observations for all firms covered in ExecuComp during the period 1993-2000 with non-missing values for all required variables. CEO age is CEO's age during the sample year (from ExecuComp). DEL is a dummy equal to one if the firm is incorporated in Delaware, in which state incorporation data comes from RiskMetrics. For firms missing state of incorporation data on RiskMetrics, we use Compustat state of incorporation data. AFT is a dummy equal to one if the firm-year observation is during the period 1996-2000. YOUNG is a dummy variable equal to one if the CEO is 50 years old or younger as of the sample year. Firm age is calculated as the sample year minus the year in which the firm was first listed on CRSP. Total risk is the natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year. Systematic risk is the natural logarithm of the annualized variance of the predicted component of stock returns using the expanded market model as described in Section II. Unsystematic risk is the natural logarithm of the annualized variance of the residual returns from the market model. Size is the natural logarithm of total assets (AT) measured in the prior fiscal year end. MB is the ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end. ROA is the ratio of net income (IB) to total assets (AT) in the prior fiscal year end. CEO delta is computed as the sensitivity of CEO's stock and option value to a 1% change in stock price in the prior fiscal year end. CEO vega is computed as the sensitivity of CEO's option value to a 1% change in stock return volatility in the prior fiscal year end. Sales growth is computed as the current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales. Firm focus is the segment sales based Herfindahl index computed as the sum of squared segment sales-total segment sales ratios. Number of segments is the firm's number of business segments from the Compustat Segment Database. Capital Expenditure is the ratio of capital expenditure (CAPX) to total assets (AT). Sale of PPE is the ratio of sale of property, plant, and equipment (SPPE) to total assets (AT). R&D is the ratio of research and development expenditure (XRD) to total assets (AT). If SPPE or R&D is missing, it is set equal to zero. Book leverage is the sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT). Total acquisition exp. is the sum of acquisitions deal values (from SDC) during the fiscal year.

Variable	Obs.	Mean	25th	Median	75th	Std. dev.
DEL*AFT*YOUNG	5,961	0.086	0.000	0.000	0.000	0.280
DEL*AFT	5,961	0.400	0.000	0.000	1.000	0.490
AFT*YOUNG	5,961	0.147	0.000	0.000	0.000	0.355
DEL*YOUNG	5,961	0.125	0.000	0.000	0.000	0.331
DEL	5,961	0.575	0.000	1.000	1.000	0.494
YOUNG	5,961	0.211	0.000	0.000	0.000	0.408
CEO age	5,961	56.232	51.000	56.000	61.000	7.661
Firm age	5,961	24.767	9.000	22.000	32.000	19.265
Total risk	5,961	7.285	6.655	7.236	7.885	0.857
Systematic risk	5,961	5.155	4.461	5.108	5.816	0.994
Unsystematic risk	5,961	7.123	6.479	7.085	7.730	0.874
Size	5,961	6.954	5.865	6.812	7.946	1.510
MB	5,961	2.108	1.282	1.658	2.371	1.395
ROA	5,961	0.049	0.025	0.058	0.093	0.094
CEO delta ($mil)	5,961	0.635	0.061	0.154	0.451	1.776
CEO vega ($mil)	5,961	0.063	0.008	0.026	0.064	0.115
Sales growth	5,961	0.131	0.016	0.089	0.197	0.258
Firm focus	5,961	0.640	0.333	0.603	1.000	0.339
Number of segments	5,961	3.654	1.000	2.000	4.000	3.874
Capital expenditure	5,961	0.074	0.036	0.059	0.091	0.058
Sale of PPE	5,961	0.004	0.000	0.000	0.002	0.012
R&D	5,961	0.033	0.000	0.003	0.040	0.059
Book leverage	5,961	0.231	0.097	0.222	0.337	0.168
Total acquisition exp.	5,961	101.229	0.000	0.000	0.000	2270.900

Table II

Correlation matrix

The table reports the pairwise correlations between main regression variables. The data set comprises 5,961 firm-year observations for all firms covered in ExecuComp during the period 1993-2000 with non-missing values for all required variables. CEO age is CEO's age during the sample year (from ExecuComp). DEL is a dummy equal to one if the firm is incorporated in Delaware, in which state incorporate data comes from RiskMetrics. For firms missing state of incorporation data on RiskMetrics, we use Compustat state of incorporation data. AFT is a dummy equal to one if the firm-year observation is during the period 1996-2000. YOUNG is a dummy variable equal to one if the CEO is 50 years old or younger as of the sample year. Firm age is calculated as the sample year minus the year in which the firm was first listed on CRSP. Total risk is the natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year. Systematic risk is the natural logarithm of the annualized variance of the predicted component of stock returns using the expanded market model as described in Section II. Unsystematic risk is the natural logarithm of the annualized variance of the residual returns from the market model. Size is the natural logarithm of total assets (AT) measured in the prior fiscal year end. MB is the ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end. ROA is the ratio of net income (IB) to total assets (AT) in the prior fiscal year end. CEO delta is computed as the sensitivity of CEO's stock and option value to a 1% change in stock price in the prior fiscal year end. CEO vega is computed as the sensitivity of CEO's option value to a 1% change in stock return volatility in the prior fiscal year end. Sales growth is computed as the current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales. Firm focus is the segment sales based Herfindahl index computed as the sum of squared segment sales-total segment sales ratios. Number of segments is the firm's number of business segments from the Compustat Segment Database. Capital expenditure is the ratio of capital expenditure (CAPX) to total assets (AT). Sale of PPE is the ratio of sale of property, plant, and equipment (SPPE) to total assets (AT). R&D is the ratio of research and development expenditure (XRD) to total assets (AT). If SPPE or R&D is missing, it is set equal to zero. Book leverage is the sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT). Total acquisition exp. is the sum of acquisitions deal values (from SDC) during the fiscal year. *p*-values in parentheses represent the significance level of each correlation coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	DEL	1.00																			
2	YOUNG	0.02	1.00																		
3	CEO age	0.00	-0.71	1.00																	
4	Firm age	-0.12	-0.23	0.23	1.00																
5	Total risk	0.04	0.23	-0.23	-0.40	1.00															
6	Systematic risk	0.04	0.16	-0.18	-0.20	0.77	1.00														
7	Unsystematic risk	0.04	0.23	-0.23	-0.42	0.99	0.69	1.00													
8	Size	0.02	-0.22	0.17	0.50	-0.39	-0.05	-0.44	1.00												
9	MB	0.01	0.07	-0.10	-0.12	0.19	0.32	0.15	-0.10	1.00											
10	ROA	-0.08	-0.08	0.09	0.10	-0.28	-0.14	-0.30	0.13	0.26	1.00										
11	CEO delta ($mil)	0.04	0.00	0.01	0.01	0.04	0.16	0.01	0.21	0.35	0.16	1.00									
12	CEO vega ($mil)	0.04	-0.05	0.02	0.17	0.02	0.16	-0.01	0.45	0.15	0.06	0.32	1.00								
13	Sales growth	0.03	0.09	-0.11	-0.20	0.12	0.15	0.10	-0.12	0.25	0.01	0.06	0.02	1.00							
14	Firm focus	-0.01	0.10	-0.10	-0.31	-0.09	-0.17	-0.07	-0.29	0.04	0.01	-0.06	-0.23	0.11	1.00						
15	Number of segments	0.01	-0.07	0.08	0.26	0.12	0.16	0.11	0.29	-0.05	-0.01	0.09	0.27	-0.09	-0.77	1.00					
16	Capital expenditure	0.04	0.06	-0.05	-0.11	0.02	0.03	0.01	-0.03	0.07	0.09	0.03	-0.04	0.08	0.12	-0.12	1.00				
17	Sale of PPE	0.00	0.04	-0.02	-0.01	0.06	0.00	0.07	-0.02	-0.09	-0.10	-0.03	-0.04	-0.05	-0.04	0.05	0.20	1.00			
18	R&D	0.06	0.13	-0.17	-0.18	0.35	0.36	0.33	-0.22	0.34	-0.24	0.00	0.02	0.09	0.11	-0.09	-0.08	-0.07	1.00		
19	Book leverage	0.04	-0.06	0.03	0.08	-0.06	-0.10	-0.05	0.26	-0.29	-0.21	-0.10	0.07	-0.06	-0.15	0.16	0.05	0.12	-0.31	1.00	
20	Total acquisition exp.	0.02	0.03	-0.02	-0.03	0.02	0.04	0.01	0.04	0.11	0.02	0.17	0.11	0.04	-0.01	0.03	-0.01	-0.01	0.01	0.00	1.00

Table III

CEO career concerns and firm risk: A propensity score matching framework

This table presents differences-in-differences-in-differences (DDD) estimates with a propensity score matching (PSM) method. To identify matching firms for Delaware firms with young and older CEOs respectively, we first estimate logit regressions to predict the incidence of the incorporation in Delaware (see Appendix for variable definitions):

$$Prob(Delaware\ young\ (older)\ CEO = 1) = \alpha + \beta_1 Size + \beta_2 MB + \beta_3 ROA + \beta_4 Sales\ growth + \beta_5 Firm\ focus + \beta_6 Log(Number\ of\ segments) + \beta_7 Firm\ age + \varepsilon.$$

For each Delaware firm with a young CEO, we select a non-Delaware firm in the same industry (based on the two-digit SIC code) that has the closest propensity score, which is the predicted value from the logit regression. Among Delaware firms with young CEOs, we calculate the average change in firm risk around the Wallace decision; we calculate average firm risk (total, systematic, and unsystematic risks) during 1993-1995 and 1996-2000 respectively and then subtract the average firm risk during 1993-1995 from the average firm risk during 1996-2000 (Column 1 in Panel A). We repeat the calculation using the non-Delaware matching peers and present the results in Column 2 of Panel A. The difference between the average change in firm risk among Delaware young CEOs and the average change in firm risk among their non-Delaware matching peers is a differences-in-differences (DD) estimate, that we present in Column 3 of Panel A. We reproduce the results using Delaware firms with older CEOs and their matching peers in Panel B. We test differences between the DD estimate for Delaware young CEOs and that for Delaware old CEOs (i.e., DDD) and present the results in Panel C. The *t*-statistics is calculated under the null hypothesis that DD or DDD equals zero. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

Table III *(continued)*

Panel A: Delaware young CEOs vs. Non-Delaware CEOs

Variable	Delaware young CEOs (No. of obs. = 122)	Non-Delaware matching CEOs	Differences-in-differences
ΔTotal risk	0.366***	0.232***	0.134*
t-stat.	*8.93*	*4.17*	*1.95*
ΔSystematic risk	0.577***	0.435***	0.142*
t-stat.	*10.42*	*6.90*	*1.69*
ΔUnsystematic risk	0.327***	0.207***	0.121*
t-stat.	*7.83*	*3.68*	*1.72*

Panel B: Delaware older CEOs vs. Non-Delaware CEOs

Variable	Delaware old CEOs (No. of obs. = 1,760)	Non-Delaware matching CEOs	Differences-in-differences
ΔTotal risk	0.183***	0.237***	-0.054***
t-stat.	*12.91*	*17.62*	*-2.78*
ΔSystematic risk	0.418***	0.463***	-0.045*
t-stat.	*25.66*	*28.00*	*-1.93*
ΔUnsystematic risk	0.153***	0.206***	-0.053***
t-stat.	*10.71*	*15.29*	*-2.70*

Panel C: Differences-in-differences-in-differences (DDD) estimations

Variable	Differences-in-differences-in-differences
Total risk	**0.189*** **
t-stat.	*2.63*
Systematic risk	**0.187** **
t-stat.	*2.15*
Unsystematic risk	**0.173** **
t-stat.	*2.38*

Table IV

CEO career concerns and firm risk

The table reports differences-in-differences-in-differences (DDD) estimates that examine the effect of CEO career concerns on firm risk (Equation (1)). The data set comprises 5,961 firm-year observations for all firms covered in ExecuComp during the period 1993-2000 with non-missing values for all required variables. In Model 1, the dependent variable is Total Risk, which is the natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year. In Model 2, the dependent variable is Systematic Risk defined as the natural logarithm of the annualized variance of the predicted component of stock returns using the expanded market model as described in Section II. In Model 3, the dependent variable is Unsystematic Risk, which is the natural logarithm of the annualized variance of the residual returns from the market model. DEL is a dummy equal to one if the firm is incorporated in Delaware. AFT is a dummy equal to one if the firm-year observation is during the period 1996-2000. YOUNG is a dummy variable equal to one if the CEO is 50 years old or younger as of the sample year. Firm age is calculated as the sample year minus the year in which the firm was first listed on CRSP. Size is the natural logarithm of total assets (AT) measured in the prior fiscal year end. MB is the ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end. ROA is the ratio of net income (IB) to total assets (AT) in the prior fiscal year end. CEO delta is computed as the sensitivity of CEO's stock and option value to a 1% change in stock price in the prior fiscal year end. CEO vega is computed as the sensitivity of CEO's option value to a 1% change in stock return volatility in the prior fiscal year end. Sales growth is computed as the current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales. Firm focus is the segment sales based Herfindahl index computed as the sum of squared segment sales-total segment sales ratios. Number of segments is the firm's number of business segments from the Compustat Segment Database. Capital expenditure is the ratio of capital expenditure (CAPX) to total assets (AT). Sale of PPE is the ratio of sale of property, plant, and equipment (SPPE) to total assets (AT). R&D is the ratio of research and development expenditure (XRD) to total assets (AT). If SPPE or R&D is missing, it is set equal to zero. Book leverage is the sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT). Standard errors are clustered at the state level (not shown). Intercepts, state-, industry (2-digit SIC)-, and year-fixed effects are not shown in the table. *p*-values represent the significance level of each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

Table IV *(continued)*

Independent variable	Predicted sign	Total risk (1)		Systematic risk (2)		Unsystematic risk (3)	
		Coefficient	*p-value*	*Coefficient*	*p-value*	*Coefficient*	*p-value*
DEL*AFT*YOUNG	**(+)**	**0.217*** **	***0.00***	**0.185*** **	***0.00***	**0.211*** **	***0.00***
DEL*AFT	**(–)**	**-0.072*** **	***0.01***	**-0.064***	***0.10***	**-0.069*** **	***0.01***
AFT*YOUNG	.	-0.172***	*0.01*	-0.172***	*0.01*	-0.159***	*0.01*
DEL*YOUNG		-0.051	*0.47*	-0.036	*0.62*	-0.046	*0.52*
DEL		-0.176	*0.19*	-0.002	*0.99*	-0.201	*0.13*
AFT		1.257***	*0.00*	1.311***	*0.00*	1.248***	*0.00*
YOUNG		0.171**	*0.02*	0.211***	*0.00*	0.152**	*0.03*
Size		-0.131***	*0.00*	0.095***	*0.00*	-0.170***	*0.00*
MB		0.045***	*0.00*	0.144***	*0.00*	0.023***	*0.00*
ROA		-1.723***	*0.00*	-1.657***	*0.00*	-1.727***	*0.00*
CEO delta ($mil)		0.005*	*0.10*	0.003	*0.47*	0.004	*0.29*
CEO vega ($mil)		0.379***	*0.00*	0.131	*0.29*	0.409***	*0.00*
Sales growth		0.047*	*0.06*	0.253***	*0.00*	0.011	*0.70*
Firm focus		0.319***	*0.00*	0.087	*0.31*	0.357***	*0.00*
Ln(Number of segments)		0.065	*0.12*	0.023	*0.56*	0.070	*0.11*
Capital expenditure		0.019	*0.90*	0.670***	*0.00*	-0.042	*0.77*
Sale of PPE		0.234	*0.61*	-0.956*	*0.06*	0.326	*0.47*
R&D		2.957***	*0.00*	3.324***	*0.00*	2.924***	*0.00*
Book leverage		0.248***	*0.00*	-0.114**	*0.03*	0.308***	*0.00*
Firm age		-0.008***	*0.00*	-0.007***	*0.00*	-0.008***	*0.00*
Firm-year observations		5,961		5,961		5,961	
R^2		0.64		0.56		0.64	
Industry F.E.		Yes		Yes		Yes	
State F.E.		Yes		Yes		Yes	
Year F.E.		Yes		Yes		Yes	
*H_0:β(DEL*AFT*YOUNG)+β(DEL*AFT)= 0*							
Coefficients sum		0.145***		0.121**		0.143***	
F-test p-value		*0.01*		*0.05*		*0.01*	

Table V

Heterogeneity in the treatment effect

The table reports the estimates of Equation (1) to examine whether the effect of CEO career concerns on firm risk varies for sub-samples that are constructed by the extent of other incentives to pursue the "quiet life". In Panel A, sub-samples are created based on firm-level variables: staggered board, CEO vega, and GIM index. In Panel B, sub-samples are created based on industry-level variables: industry competitiveness and industry peer composition. In the first column of Panel A, 5,737 firm-year observations, for which the information on staggered board is available from RiskMetrics, are divided into two groups based on the presence of staggered board. In Columns 2 and 3 of Panel A, each year we sort firms into terciles based on CEO vega and GIM index (Gompers, Ishii, and Metrick, 2003). CEO vega is computed as the sensitivity of CEO's option value to a 1% change in stock return volatility in the prior fiscal year end (Core and Guay, 2002). High (low) CEO vega refers to the highest (lowest) CEO vega tercile. High (low) GIM index refers to the highest (lowest) GIM index tercile. The information on staggered board and GIM index is available in 1993, 1995, 1998, and 2000 from the RiskMetrics publications. We assume that in between publication years, firms have the same staggered board and GIM as in the prior publication year. In the first column of Panel B, each year we sort firms into terciles based on the Herfindahl-Hirschman index (HHI) defined as the sum of squared market shares. Market share is the ratio of the firm's sales (SALE) to the sum of sales of all Compustat firms in the same three-digit SIC code. High (low) industry competitiveness refers to the lowest (highest) HHI tercile. In the second column of Panel B, each year we sort firms into two groups based on industry peer composition. For each two-digit SIC industry in 1994, we calculate the percentage of young CEOs, who are 50 years old or younger. If the percentage is higher than or equal to 40%, a given industry is classified as young, and otherwise as old. We require each industry to have at least 5 CEOs with age information available from ExecuComp. The dependent variable is Total risk, which is the natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year. DEL is a dummy equal to one if the firm is incorporated in Delaware. AFT is a dummy equal to one if the firm-year observation is during the period 1996-2000. YOUNG is a dummy variable equal to one if the CEO is 50 years old or younger as of the sample year. Firm age is calculated as the sample year minus the year in which the firm was first listed on CRSP. Size is the natural logarithm of total assets (AT) measured in the prior fiscal year end. MB is the ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end. ROA is the ratio of net income (IB) to total assets (AT) in the prior fiscal year end. CEO delta is computed as the sensitivity of CEO's stock and option value to a 1% change in stock price in the prior fiscal year end. Sales growth is computed as the current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales. Firm focus is the segment sales based Herfindahl index computed as the sum of squared segment sales-total segment sales ratios. Number of segments is the firm's number of business segments from the Compustat Segment Database. Capital expenditure is the ratio of capital expenditure (CAPX) to total assets (AT). Sale of PPE is the ratio of sale of property, plant, and equipment (SPPE) to total assets (AT). R&D is the ratio of research and development expenditure (XRD) to total assets (AT). If SPPE or R&D is missing, it is set equal to zero. Book leverage is the sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT). Standard errors are clustered at the state level (not shown). Intercepts, state-, industry (2-digit SIC)-, and year-fixed effects are not shown in the table. *P*-values represent the significance level of each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

Table V *(continued)*

Panel A: Firm-level heterogeneity

	Staggered board				CEO vega				GIM index			
	Yes		*No*		*Low*		*High*		*Low*		*High*	
Independent variable	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*
DEL*AFT*YOUNG	**0.141***	***0.06***	**0.260*****	***0.00***	**0.360*****	***0.00***	**0.035**	***0.78***	**0.156***	***0.08***	**-0.131**	***0.32***
DEL*AFT	**-0.063****	***0.03***	**-0.073**	***0.14***	**-0.136*****	***0.00***	**-0.004**	***0.93***	**-0.057**	***0.17***	**-0.109***	***0.06***
AFT*YOUNG	-0.096	*0.17*	-0.233***	*0.01*	-0.242**	*0.02*	-0.053	*0.66*	-0.072	*0.42*	0.071	*0.56*
DEL*YOUNG	*0.008*	*0.91*	*-0.154*	*0.15*	*-0.111*	*0.28*	*0.072*	*0.52*	*-0.073*	*0.44*	*0.127*	*0.24*
DEL	*-0.454****	*0.00*	*-0.138*	*0.40*	*-0.091*	*0.79*	*-0.076*	*0.68*	*0.135****	*0.00*	*0.199****	*0.00*
AFT	*1.229****	*0.00*	*1.346****	*0.00*	*1.062****	*0.00*	*1.404****	*0.00*	*1.250****	*0.00*	*1.446****	*0.00*
YOUNG	*0.127**	*0.06*	*0.245***	*0.02*	*0.227***	*0.03*	*0.032*	*0.77*	*0.112*	*0.21*	*0.004*	*0.96*
Size	-0.148***	*0.00*	-0.093***	*0.00*	-0.155***	*0.00*	-0.096***	*0.00*	-0.038***	*0.00*	-0.089***	*0.00*
MB	0.073***	*0.00*	0.029***	*0.00*	0.058***	*0.01*	0.034**	*0.02*	0.037***	*0.00*	0.079***	*0.00*
ROA	-1.923***	*0.00*	-1.537***	*0.00*	-1.836***	*0.00*	-1.522***	*0.00*	-1.495***	*0.00*	-2.724***	*0.00*
CEO Delta ($mil)	0.002	*0.63*	0.002	*0.79*	0.005	*0.54*	0.006*	*0.07*	-0.008	*0.11*	-0.002	*0.74*
CEO Vega ($mil)	0.257**	*0.02*	0.380***	*0.01*	0.331	*0.91*	0.237**	*0.02*	0.493**	*0.02*	0.031	*0.72*
Sales Growth	0.113***	*0.01*	0.015	*0.67*	-0.137***	*0.00*	0.230***	*0.00*	0.053	*0.29*	0.026	*0.57*
Firm Focus	0.360***	*0.00*	0.225***	*0.00*	0.189	*0.16*	0.274**	*0.03*	0.218**	*0.04*	0.228***	*0.00*
Ln(Number of Segments)	0.121*	*0.06*	0.013	*0.74*	0.096	*0.14*	0.046	*0.37*	0.026	*0.59*	0.014	*0.80*
Capital Expenditure	0.007	*0.96*	0.273	*0.26*	-0.314	*0.29*	0.668*	*0.07*	0.308	*0.22*	0.262	*0.52*
Sale of PPE	1.265*	*0.06*	-0.955	*0.25*	-0.065	*0.91*	-2.326***	*0.00*	-0.728	*0.39*	3.574***	*0.00*
R&D	3.140***	*0.00*	3.217***	*0.00*	3.042***	*0.00*	3.039***	*0.00*	3.155***	*0.00*	2.800***	*0.00*
Book Leverage	0.294***	*0.01*	0.215***	*0.01*	0.620***	*0.00*	-0.038	*0.68*	0.146***	*0.00*	0.205	*0.30*
Firm Age	-0.007***	*0.00*	-0.007***	*0.00*	-0.011***	*0.00*	-0.006***	*0.00*	-0.011***	*0.00*	-0.005***	*0.00*
Firm-year observations	3,412		2,325		1,983		1,988		1,682		1,607	
R^2	0.64		0.68		0.63		0.72		0.71		0.67	
Industry F.E.	Yes		Yes		Yes		Yes		Yes		Yes	
State F.E.	Yes		Yes		Yes		Yes		Yes		Yes	
Year F.E.	Yes		Yes		Yes		Yes		Yes		Yes	
*H_o: β(DEL*AFT*YOUNG) + β(DEL*AFT) = 0*												
Coefficients sum	0.078		0.183***		0.224**		0.031		0.099		-0.240**	
F-test p-value	*0.20*		*0.01*		*0.02*		*0.77*		*0.21*		*0.03*	
*H_o: βhigh(DEL*AFT*YOUNG) = βlow(DEL*AFT*YOUNG).*												
t-test p-value		*0.29*				*0.05***				*0.07**		

Table V *(continued)*

Panel B: Industry-level heterogeneity

	Industry competitiveness				Majority of peers			
	High		*Low*		*Young*		*Old*	
Independent variable	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*	*Coeff.*	*p-val.*
DEL*AFT*YOUNG	**0.236*** **	***0.00***	**0.043**	***0.82***	**0.273*** **	***0.01***	**0.187** **	***0.02***
DEL*AFT	**-0.063** **	***0.05***	**-0.107***	***0.10***	**-0.031**	***0.55***	**-0.069** **	***0.03***
AFT*YOUNG	-0.210***	*0.01*	-0.057	*0.75*	-0.350***	*0.00*	-0.137*	*0.06*
DEL*YOUNG	*-0.104*	*0.13*	*-0.239*	*0.23*	-0.009	*0.92*	-0.056	*0.55*
DEL	*-0.007*	*0.97*	*-0.177**	*0.08*	-0.129***	*0.01*	-0.181	*0.16*
AFT	*1.260****	*0.00*	*1.171****	*0.00*	1.144***	*0.00*	1.290***	*0.00*
YOUNG	*0.210****	*0.00*	*0.337**	*0.10*	0.277***	*0.00*	0.154*	*0.08*
Size	-0.138***	*0.00*	-0.174***	*0.00*	-0.146***	*0.00*	-0.130***	*0.00*
MB	0.038***	*0.00*	0.075*	*0.06*	0.031*	*0.09*	0.052***	*0.00*
ROA	-1.593***	*0.00*	-2.059***	*0.00*	-1.701***	*0.00*	-1.725***	*0.00*
CEO Delta ($mil)	0.018***	*0.00*	0.0002	*0.99*	0.025**	*0.02*	-0.003	*0.51*
CEO Vega ($mil)	0.330***	*0.00*	0.428**	*0.02*	0.551***	*0.00*	0.326***	*0.01*
Sales Growth	0.049**	*0.04*	-0.042	*0.66*	0.115*	*0.09*	0.051**	*0.05*
Firm Focus	0.302***	*0.00*	0.330***	*0.00*	0.318***	*0.00*	0.296***	*0.00*
Ln(Number of Segments)	0.081**	*0.02*	0.101*	*0.08*	0.138***	*0.00*	0.063	*0.22*
Capital Expenditure	-0.027	*0.81*	0.651	*0.19*	-1.477***	*0.00*	0.345**	*0.03*
Sale of PPE	1.498***	*0.01*	-6.075***	*0.01*	1.171	*0.12*	0.296	*0.59*
R&D	2.726***	*0.00*	1.935***	*0.01*	3.380***	*0.00*	2.739***	*0.00*
Book Leverage	0.071***	*0.19*	1.320***	*0.00*	0.458***	*0.00*	0.193***	*0.00*
Firm Age	-0.008***	*0.00*	-0.008***	*0.01*	-0.013***	*0.00*	-0.007***	*0.00*
Firm-year observations	4,018		625		1,042		4,826	
R^2	0.65		0.71		0.64		0.64	
Industry F.E.	Yes		Yes		Yes		Yes	
State F.E.	Yes		Yes		Yes		Yes	
Year F.E.	Yes		Yes		Yes		Yes	
*H_o: β(DEL*AFT*YOUNG) + β(DEL*AFT) = 0*								
Coefficients sum	0.173***		-0.064		0.242***		0.117*	
F-test p-value	*0.01*		*0.71*		*0.00*		*0.10*	
*H_o: βhigh(DEL*AFT*YOUNG) = βlow(DEL*AFT*YOUNG).*								
t-test p-value		*0.25*				*0.74*		
*H_o: βyoung(DEL*AFT) = βold(DEL*AFT).*								
t-test p-value						*0.53*		

Table VI

CEO age, firm risk, and external governance – no exogenous shock

The initial sample comprises 10,906 firm-year observations for all firms covered in ExecuComp during the period 1992-2006 with non-missing values for all required variables. Each year, we sort firms into quartiles based on the GIM-index (Gompers, Ishii, and Metrick, 2003) in Columns 1 and 2, and industry competitiveness, measured by HHI, in Columns 3 and 4. The information on GIM index is available in 1990, 1993, 1995, 1998, 2000, 2002, and 2004 from the RiskMetrics publications. We assume that in between publication years, firms have the same GIM as in the prior publication year. For each quartile, we estimate the following OLS regression model:

$$Total\ risk_{jt} = \alpha_t + \delta_i + \beta * (CEO\ age) + \gamma \boldsymbol{X}_{jt} + \varepsilon_{jt}$$

Strong governance refers to the lowest GIM quartile, and Weak governance refers to the highest GIM quartile. High competition refers to the lowest HHI quartile, and Low governance refers to the highest HHI quartile. The dependent variable is Total risk, which is the natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year. Size is the natural logarithm of total assets (AT) measured in the prior fiscal year end. MB is the ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end. ROA is the ratio of net income (IB) to total assets (AT) in the prior fiscal year end. Sales growth is computed as the current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales. Number of segments is the firm's number of business segments from the Compustat Segment Database. Capital expenditure is the ratio of capital expenditure (CAPX) to total assets (AT). Sale of PPE is the ratio of sale of property, plant, and equipment (SPPE) to total assets (AT). R&D is the ratio of research and development expenditure (XRD) to total assets (AT). If SPPE or R&D is missing, it is set equal to zero. Book leverage is the sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT). Standard errors are clustered at the state level (not shown). Intercepts, industry (2-digit SIC)- and year-fixed effects are not shown in the table. *P*-values represent the significance level of each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

Table VI *(continued)*

	Dependent variable = Total risk							
	GIM				HHI			
	Strong governance (Q1)		Weak governance (Q4)		High competition (Q1)		Low competition (Q4)	
Independent variable	*Coeff.*	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
CEO age	**-0.008*** **	***0.00***	**-0.001**	***0.71***	**-0.011*** **	***0.00***	**-0.004**	***0.16***
Firm size	-0.139***	*0.00*	-0.171***	*0.00*	-0.187***	*0.00*	-0.202***	*0.00*
M/B	0.020**	*0.02*	0.054***	*0.00*	0.027***	*0.00*	0.052***	*0.01*
ROA	-1.028***	*0.00*	-2.126***	*0.00*	-0.611***	*0.00*	-2.684***	*0.00*
Book leverage	0.142	*0.37*	0.350**	*0.02*	0.077	*0.31*	0.521***	*0.00*
Capital expenditure	0.071	*0.86*	-0.224	*0.63*	-0.138	*0.50*	0.228	*0.56*
Sale of PPE	0.805	*0.50*	2.405**	*0.02*	-0.035	*0.98*	-0.261	*0.76*
R&D	0.208	*0.31*	3.207***	*0.00*	1.470***	*0.00*	-1.109	*0.29*
Log(No. of segments)	-0.114***	*0.01*	-0.072**	*0.04*	-0.076***	*0.00*	-0.064	*0.15*
GIM	-0.035*	*0.06*	-0.025	*0.11*				
HHI					-2.380***	*0.00*	-0.420	*0.28*
Firm-year observations	2829		2705		8449		1993	
R^2	0.60		0.60		0.62		0.59	
Industry F.E.	Yes		Yes		Yes		Yes	
Year F.E.	Yes		Yes		Yes		Yes	

Table VII

Young CEO departures and new employment opportunities

Panel A presents summary statistics of stated reasons for young CEO departures. Following Fee and Hadlock (2004), we identify young CEO departures for firms covered in ExecuComp during 1996 and 2000 and collect information on the reasons behind their departures from news articles, mainly using the Factiva search engine. Each of the young CEO departures is assigned to a single category based on its reason. We assign a departure to the PURSUE category if a news article specifies that the young CEO leaves the company to pursue other interests or similar expression. Among the remaining departures, we assign the departure to the FORCED category if the young CEO is ousted from office. For the remaining departures, we assign the departure to the CONTROL category if the departure is associated with corporate control activity such as M&As, divestitures, and ownership transitions. The remaining departures are assigned to the RETIRE category, if a news article explicitly describes the departure using the word "retire". All the remaining departures are assigned to the RESIGN category. Panel B reports summary statistics of young CEOs' new employment opportunities following departures. Panel C presents the estimates of logit regression coefficients in order to examine the relationship between young CEOs' risk-taking and their subsequent employment opportunities. Intercepts, industry (2-digit SIC)-, and year-fixed effects are not shown in the table. *p*-values represent the significance level of each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

Table VII (*continued*)

Panel A: Reasons for young CEOs' departures

	N	*%*
PURSUE	19	24.05%
FORCED	20	25.32%
CONTROL	5	6.33%
RETIRE	4	5.06%
RESIGN	31	39.24%
Total	79	100.00%

Panel B: Career opportunities following young CEOs' departures

	N	*%*		*N*	*%*		*N*	%	New employer	*N*
CEOs who land a new executive position	46	58%	Receive CEO positions at a new employer	28	61%	PURSUE	6	21%	public	0
									private	6
						FORCED	6	21%	public	1
									private	5
						CONTROL	4	14%	public	1
									private	3
						RETIRE	0	0%	public	0
									private	0
						RESIGN	12	43%	public	5
									private	7
			Receive non-CEO positions at a new employer	18	39%	PURSUE	12	67%	public	5
									private	7
						FORCED	2	11%	public	0
									private	1
									governor	1
						CONTROL	0	0%	public	0
									private	0
						RETIRE	0	0%	public	0
									private	0
						RESIGN	4	22%	public	2
									private	2
CEOs who do not land a new executive position	33	42%				PURSUE	1	3%		
						FORCED	12	36%		
						CONTROL	1	3%		
						RETIRE	4	12%		
						RESIGN	15	45%		
Total	79	*100%*								

Table VII (*continued*)

Panel C: Risk-taking and the likelihood of getting a new executive position

	Dependent variable: Dummy equals 1 if a CEO obtains a new executive position.	
	Coeff.	*p-value*
CEO age	-0.058	*0.61*
CEO tenure	0.354**	*0.02*
Size	0.389	*0.17*
Firm performance	0.229	*0.95*
Risk-taking	1.783***	*0.00*
FORCED	-0.073	*0.98*
CONTROL	-1.968	*0.35*
RETIRE	-18.892***	*0.00*
PURSUE	13.494***	*0.00*
Number of observations	73	
Number of firms	65	
R^2	0.7962	
Industry F.E.	Yes	
Year F.E.	Yes	
State F.E.	No	
State-level clustered S.E.	Yes	

Table VIII

Long-run stock performance

The table presents abnormal returns to portfolios of Delaware firms having a young or older CEO during the period 1996-2000. In each month, we form a portfolio that consists of Delaware firms having a young CEO and another portfolio that consists of Delaware firms with an older CEO. The time series of each portfolio's monthly excess returns are then regressed on the three/four return factors. Panel A reports the estimates of abnormal returns to the portfolios using Fama and French's (1993) three factor model: $R_{p,t} - R_{f,t} = \alpha + \beta(R_{m,t} - R_{f,t}) + \gamma SMB_t + \delta HML_t + \varepsilon$ where $R_{p,t}$ is the monthly portfolio return of young/older Delaware firms in month *t*; $R_{f,t}$ is the three-month Treasury bill yield in month *t*; $R_{m,t}$ is the return on the value-weighted/equal-weighted index of stocks listed on NYSE, AMEX, and NASDAQ in month *t*; SMB_t is the return on small firms net the return on large firms in month *t*; HML_t is the return on high book-to-market firms net the return on low book-to-market firms in month *t.* Panel B reports the estimates of abnormal returns to the portfolios using Carhart's (1997) four factor model: $R_{p,t} - R_{f,t} = \alpha + \beta(R_{m,t} - R_{f,t}) + \gamma SMB_t + \delta HML_t + \theta MOM_t + \varepsilon$ where MOM_t is the momentum factor in month *t. t*-statistics are presented in brackets. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

Panel A: Fama-French three-factor model

	Value-weighted portfolios	Equal-weighted portfolios
	Intercept	*Intercept*
Young Delaware CEOs	0.714*	1.892***
t-stat.	*(1.91)*	*(5.39)*
Adj. R²	0.89	0.86
Older Delaware CEOs	0.146	0.677**
t-stat.	*(1.05)*	*(2.18)*
Adj. R²	0.94	0.79
Diff.	0.568	1.216***
t-stat.	*(1.42)*	*(2.60)*

Panel B: Carhart four-factor model

	Value-weighted portfolios	Equal-weighted portfolios
	Intercept	*Intercept*
Young Delaware CEOs	0.501	1.812***
t-stat.	*(1.17)*	*(4.35)*
Adj. R²	*0.89*	0.86
Older Delaware CEOs	0.276*	0.825**
t-stat.	*(1.74)*	*(2.20)*
Adj. R²	0.94	0.79
Diff.	0.225	0.987*
t-stat.	*(0.49)*	*(1.76)*

A.I

CEO career concerns and corporate investment and financing policies

The table reports differences-in-differences-in-differences (DDD) estimates that examine the effect of CEO career concerns on corporate investment and financing decisions. The data set comprises 5,961 firm-year observations for all firms covered in ExecuComp during the period 1993-2000 with non-missing values for all required variables. In Model 1, the dependent variable is Capital expenditure, which is the ratio of capital expenditure (CAPX) to total assets (AT). In Model 2, the dependent variable is Sale of PPE defined as the ratio of sale of property, plant, and equipment (SPPE) to total assets (AT). In Model 3, the dependent variable is R&D, which is the ratio of research and development expenditure (XRD) to total assets (AT). If SPPE or R&D is missing, it is set equal to zero. In Model 4, the dependent variable is Book leverage, which is the sum of the firm's long-term debt (DLTT) and short-term debt (DLC), all scaled by total assets (AT). In Model 5, the dependent variable is Total acquisition exp., the sum of acquisitions deal values (from SDC) during the fiscal year. DEL is a dummy equal to one if the firm is incorporated in Delaware. DEL is a dummy equal to one if the firm is incorporated in Delaware. AFT is a dummy equal to one if the firm-year observation is during the period 1996-2000. YOUNG is a dummy variable equal to one if the CEO is 50 years old or younger as of the sample year. Firm age is calculated as the sample year minus the year in which the firm was first listed on CRSP. Size is the natural logarithm of total assets (AT) measured in the prior fiscal year end. MB is the ratio of the market value (AT – CEQ + PRCC_F*CSHO) to book value of assets (AT) in the prior fiscal year end. ROA is the ratio of net income (IB) to total assets (AT) in the prior fiscal year end. CEO delta is computed as the sensitivity of CEO's stock and option value to a 1% change in stock price in the prior fiscal year end. CEO vega is computed as the sensitivity of CEO's option value to a 1% change in stock return volatility in the prior fiscal year end. Sales growth is computed as the current year's sales (SALE) minus the prior year's sales, all scaled by the prior year's sales. Firm focus is the segment sales based Herfindahl index computed as the sum of squared segment sales-total segment sales ratios. Number of segments is the firm's number of business segments from the Compustat Segment Database. Standard errors are clustered at the state level (not shown). Intercepts, state-, industry (2-digit SIC)-, and year-fixed effects are not shown in the table. *p*-values represent the significance level of each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

A.I *(continued)*

Independent variable	Capital expenditure		Sale of PPE		R&D		Book leverage		Total acquisition exp.	
	(1)		(2)		(3)		(4)		(5)	
	Coefficient	*p-value*	*Coefficient*	*p-value*	*Coefficient*	*p-value*	*Coefficient*	*p-value*	*Coefficient*	*p-value*
DEL*AFT*YOUNG	0.012***	*0.01*	0.001	*0.31*	0.002	*0.68*	0.039**	*0.05*	0.074	*0.67*
DEL*AFT	0.000	*0.80*	-0.001	*0.14*	-0.001	*0.24*	-0.007	*0.25*	0.051	*0.43*
AFT*YOUNG	-0.004	*0.33*	-0.001	*0.57*	-0.006	*0.33*	-0.025	*0.20*	-0.037	*0.83*
DEL*YOUNG	0.001	*0.74*	0.000	*0.77*	-0.004	*0.40*	-0.048***	*0.01*	-0.035	*0.85*
DEL	0.004	*0.84*	0.006**	*0.03*	-0.004	*0.76*	0.083***	*0.00*	0.755***	*0.01*
AFT	-0.009***	*0.01*	0.002**	*0.02*	0.000	*0.84*	0.018**	*0.02*	-0.196*	*0.06*
YOUNG	0.002	*0.65*	0.001	*0.47*	0.012**	*0.02*	0.031*	*0.10*	0.189	*0.32*
Size	0.000	*0.73*	0.000	*0.61*	-0.001	*0.20*	0.028***	*0.00*	0.188***	*0.00*
MB	0.004***	*0.00*	0.000	*0.45*	0.010***	*0.00*	-0.008**	*0.02*	0.072**	*0.03*
ROA	0.077***	*0.00*	-0.011***	*0.00*	-0.211***	*0.00*	-0.420***	*0.00*	1.987***	*0.00*
CEO delta ($mil)	0.000	*0.58*	0.000	*0.84*	-0.002***	*0.00*	-0.009***	*0.00*	0.072***	*0.00*
CEO vega ($mil)	-0.019	*0.12*	-0.006**	*0.02*	0.029***	*0.00*	0.008	*0.74*	-0.026	*0.91*
Sales growth	0.006**	*0.02*	-0.002***	*0.00*	-0.008***	*0.00*	-0.001	*0.93*	1.227***	*0.00*
Firm focus	0.000	*0.95*	0.002*	*0.06*	0.016***	*0.00*	0.033***	*0.00*	0.177*	*0.08*
Ln(Number of segments)	-0.004**	*0.03*	0.001**	*0.03*	0.002	*0.50*	0.019***	*0.00*	0.183***	*0.00*
Capital expenditure			0.017***	*0.00*	0.033**	*0.02*	0.113	*0.11*	-1.883**	*0.02*
Sale of PPE	0.295***	*0.00*			-0.008	*0.85*	0.352	*0.11*	-1.526	*0.23*
R&D	0.041***	*0.01*	-0.001	*0.85*			-0.730***	*0.00*	1.857***	*0.00*
Book leverage	0.012	*0.12*	0.002	*0.13*	-0.064***	*0.00*			0.953***	*0.00*
Firm age	0.000	*0.24*	0.000	*0.49*	0.000***	*0.01*	-0.001***	*0.00*	-0.026***	*0.00*
Firm-year observations	5,961		5,961		5,961		5,961		5,961	
R^2	0.39		0.22		0.54		0.35		0.17	
Industry F.E.	Yes		Yes		Yes		Yes		Yes	
State F.E.	Yes		Yes		Yes		Yes		Yes	
Year F.E.	Yes		Yes		Yes		Yes		Yes	
*H_o: β(DEL*AFT*YOUNG) + β(DEL*AFT) = 0.*										
Coefficients Sum	0.012**		0.000		0.001		0.032*		0.125	
F-test p-value	*0.02*		*0.94*		*0.86*		*0.08*		*0.39*	

A.II

The effect of CEO career concerns on firm risk via CAPEX and R&D across financing activities

Panel A presents the estimates of Equation (2) that examines whether CEO career concerns influence firm risk through their impact on capital expenditure (CAPEX) across varying financing activities. The category SPPE > 0 includes 2,379 firm-year observations in which SPPE is positive during the fiscal-year. The category SPPE = 0 contains 3,582 firm-year observations in which SPPE is zero or missing during the fiscal-year. We further stratify the SPPE > 0 (SPPE = 0) category into four sets of subgroups based on the firm's financing activities. The category Capital ↑ includes 410 (585) firm-year observations where the firm's net debt issuance (total debt issuance net debt retirement) and net equity issuance (equity sales net equity purchases) are both positive during the fiscal year. The Capital ↓ category comprises of 578 (833) firm-year observations in which both of net debt issuance and net equity issuance are less than or equal to zero during the fiscal year. The Leverage ↑ category consists of 585 (918) firm-year observations in which firm's net debt issuance is positive but net equity issuance is less than or equal to zero during the fiscal year. The Leverage ↓ category includes 806 (1,246) firm-year observations where the firm's net debt issuance is less than or equal to zero but net equity issuance is positive during the fiscal year. Panel B reports the estimates of Equation (2) with research and development expenditure (RD). Total risk is the natural logarithm of the annualized variance of the firm's daily stock returns during the fiscal year. Systematic risk is the natural logarithm of the annualized variance of the predicted component of stock returns using the expanded market model as described in Section II. Unsystematic risk is the natural logarithm of the annualized variance of the residual returns from the market model. Standard errors are clustered at the state level (not shown). Intercepts, state-, industry (2-digit SIC)-, and year-fixed effects are not shown in the table. *p*-values represent the significance level of each coefficient. ***, **, and * indicate significance at the 1%, 5%, and 10%, respectively (two-tailed).

A.II *(continued)*

Panel A: Firm risk via capital expenditure

	Total risk		Systematic risk		Unsystematic risk	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Full sample	0.460	*0.61*	1.746*	*0.08*	0.282	*0.76*
SPPE > 0	-1.524	*0.12*	0.311	*0.83*	-1.729*	*0.10*
Capital ↑	4.867	*0.19*	-0.290	*0.94*	5.485	*0.16*
Leverage ↑	-7.784***	*0.00*	-2.951	*0.24*	-8.192***	*0.00*
Leverage ↓	-5.805**	*0.02*	3.895	*0.34*	-7.181***	*0.00*
Capital ↓	-13.288*	*0.06*	-7.803	*0.38*	-14.303**	*0.05*
SPPE = 0	2.151	*0.11*	3.171**	*0.03*	1.988	*0.16*
Capital ↑	1.983	*0.28*	3.887**	*0.04*	1.831	*0.36*
Leverage ↑	1.095	*0.83*	-3.518	*0.22*	1.174	*0.82*
Leverage ↓	10.807***	*0.00*	10.673**	*0.02*	10.212***	*0.01*
Capital ↓	4.455	*0.23*	8.289*	*0.06*	4.334	*0.25*

Panel B: Firm risk via R&D

	Total risk		Systematic risk		Unsystematic risk	
	Coeff.	*p-value*	*Coeff.*	*p-value*	*Coeff.*	*p-value*
Full sample	-2.081***	*0.00*	-1.703	*0.27*	-2.180***	*0.00*
SPPE > 0	4.179	*0.37*	-0.711	*0.91*	4.796	*0.31*
Capital ↑	20.593*	*0.06*	40.018***	*0.00*	15.417	*0.17*
Leverage ↑	9.003	*0.34*	-2.077	*0.85*	9.412	*0.31*
Leverage ↓	-1.014	*0.86*	-5.383	*0.57*	-0.293	*0.96*
Capital ↓	6.749	*0.36*	2.035	*0.82*	7.410	*0.31*
SPPE = 0	-2.047***	*0.01*	-1.797	*0.19*	-2.146***	*0.01*
Capital ↑	-8.159***	*0.00*	-8.009***	*0.00*	-8.180***	*0.00*
Leverage ↑	-9.341	*0.25*	-5.958	*0.22*	-10.264	*0.24*
Leverage ↓	0.731	*0.59*	2.193	*0.46*	0.509	*0.74*
Capital ↓	-3.725**	*0.02*	-2.496	*0.40*	-3.969***	*0.01*