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2011/73/FIN

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March 2009, revised June 2011

I would like to thank Eric de Bodt, Riccardo Calcagno, Vicente Cunat, Sandeep Dahiya, Liz Demers, Espen Eckbo, Lily Fang, Daniel Ferreira, Denis Gromb, Jay Hartzell, Harald Hau, Steven Kaplan, Massimo Massa, Daniel Metzger, Kasper Meisner Nielsen, Tom Noe, Clemens Otto, Amine Ouazad, Urs Peyer, Avri Ravid, Katya Salavei, Simone Schaner, Benjamin Segal, Henri Servaes, Karin Thorburn, Soojin Yim, and Alminas Zaldokas as well as other seminar participants at the AFFI 2009, the Lille Ph.D. Symposium on Corporate Control and Governance, the New York FMA 2010, the FRA 2010, Tulane University, University of Utah, University of Toronto, NTU, Copenhagen Business School, LSE, Warwick Business School, Boston College, Fordham University, and INSEAD for their helpful comments and discussions. I also thank Michael Hoover, John Maalouf, and Olivia Orza for their advice on US employment law, Holger Jahn and Jean-Luc Mauron for our discussions on contract design practices, Bhaskar Deol for his help with the data collection, and especially my dissertation chair, Theo Vermaelen, for his support and encouragement. I take responsibility for all errors and gratefully acknowledge the financial support of the INSEAD Alumni Fund.

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Abstract

This paper studies contract horizon and investment using a new dataset of 3,717 US CEO employment contracts. It finds that contract horizon (1) predicts realized tenure, (2) is positivelycorrelated with both capital expenditure and R&D expenses, and (3) firms do not perform better when the CEO has less time. I control for endogeneity using inter-state differences in the judicial treatment of contracts as an instrumental variable for the choice between contract types. The impact of contract horizon remains significant controlling for long-term compensation and executive fixed effects. I conclude that CEO contract horizon has a positive influence on investment.

JEL Classification: G32, G34, J41

Keywords: Underinvestment; Investment Horizon; CEO Contracts.

CEOs are often accused of myopia, i.e., of failing to invest in projects that only improve long-term shareholder value.[1] Much of this discussion has focused on incentive pay. This paper seeks to draw attention to another, less explored dimension of executive incentives: their contract horizon. Empirical literature on executive horizon has been limited so far. Yet, many US chief executive officers (CEOs) operate under explicit employment contracts that are publicly available. Based on a new, hand-collected dataset of 3,717 of these documents, I find that contract horizon is relevant for investment: CEOs with a shorter remaining contract term invest less than their peers do, both in terms of CAPEX and R&D expenses. I find no evidence that CEOs cut investment to increase short-term earnings: CEOs with a short contract horizon do not perform better. A potential concern is that contract terms may reflect investment opportunities. Therefore, I use differences in state laws that led to variation in the popularity of contract types as an instrumental variable to isolate causal effects of contract horizon on investment.

In the US, CEOs can be employed under two contract types. Under *fixed-term* employment, dismissal before the contractual termination date is costly and can lead to litigation; under *at-will* employment, the firm or the employee can terminate the relationship at any time and for any cause. From a legal perspective, this makes at-will contracts infinitely short term. I study the incentive effects of contract *types* and *length*. Because remaining contract length decreases over time, I am able to track the behavior of a given CEO under different horizon. The comparison between fixed-term and at-will contracts is less straightforward due to endogeneity,

[1] Effects of a short executive horizon ("myopia") have been discussed by, among others, Narayanan (1985), Stein (1988), Stein (1989), Froot, Perold and Stein (1992), and Bolton, Scheinkman and Xiong (2006). Laverty (1996) provides an overview of the strategy literature on this topic.

i.e., firms may choose the CEO contract type based on their investment opportunities. Therefore, I use the legal environment to instrument the choice of contract type. Some states have more employee-friendly court records – particularly states that restrict the right to dismiss at-will employees. These states have a greater proportion of at-will and shorter employment contracts. In my sample, 30% of the contracts governed by state laws with the so-called at-will exceptions are at-will, as opposed to 19% in non-exception states. The exceptions have antecedents that are not correlated with investment. The correlation with capital expenditure is 1.1%.

First, I find that contract horizon matters for the actual time an executive stays in office. Within the sample of fixed-term contracts, CEOs who are further away from their contractual termination date have, on average, a significantly longer remaining office term. This is likely because early dismissal can result in severance pay proportional to the contractual time remaining. In contrast, the legal cost of dismissal does not vary over time for at-will employed CEOs. Consistent with this reasoning, I find that CEOs under at-will contracts have a significantly shorter expected time until termination than CEOs under fixed-term contracts. Note that this is not driven by differences in the treatment of at-will contracts: the expected tenure under an at-will contract is not significantly different across states with or without the court exception.

Next, I turn to the relation between horizon and investment. The focus of the theoretical debate over "economic short-termism" is the hypothesis that myopic CEOs fail to make investments in projects with long-term payoffs. In particular, myopic managers may forgo productive investments in order to boost contemporaneous earnings (Stein, 1989). They may also

overinvest in unproductive projects in order to signal that they have investment opportunities (Bebchuk and Stole, 1993), to make themselves indispensable (Noe and Rebello, 1997), or to take excessive risks (Chevalier and Ellison, 1999). Alternatively, CEOs may simply lose the incentive for long-term performance: given a non-trivial likelihood of termination, their performance has a smaller expected effect on future compensation decisions (Gibbons and Murphy, 1992) as well as the value of their long-term incentives, as many of them forfeit long-term compensation upon termination (Dahiya and Yermack, 2008).

The expected CEO horizon has a positive impact on investment in capital expenditure and R&D. CEOs with one more year remaining under the contract invest 2.6%-points more in industry adjusted capital expenditure. That is, a CEO under a five-year contract invests in his first year 13%-points more than in his last year. The magnitudes are comparable in terms of R&D expenses. Effects are much more pronounced when I compare CEOs under fixed-term contracts with CEOs under at-will contracts. In terms of industry adjusted capital expenditures, the difference between an at-will and a fixed term contract is seven times the difference between a first- and last year CEO under a five-year contract. This translates to 53% of one standard deviation of the dependent variable. In terms of industry adjusted R&D expenses, the effect is twelve times the difference between a first- and last year CEO under a five-year contract, or 56% of one standard deviation of the dependent variable.

Does a short contract horizon itself reduce incentives to maximize long-term payoffs, or are CEOs trying to manipulate a re-election? Stein (1988, 1989) argues that CEOs with upcoming elections have an incentive to forsake investments to boost earnings. In my sample,

however, CEOs with a shorter expected horizon do not perform better. On contrary, CEOs under fixed-term contracts are more profitable than CEOs under at-will contracts, and profitability does not increase as the CEO gets closer to contract expiration.

Empirical studies of CEO employment contracts are recent and few in number. Schwab and Thomas (2005) describe a sample of 375 contracts from a legal perspective. Gillan, Hartzell, and Parrino (2009) show that many CEOs (in 2000) operate without an explicit employment contract, and study the choice between explicit and implicit contracts. I build on their work by showing the impact of contract horizon on career outcomes and investment. On a more general level, my findings imply that employment contracts affect firm performance at all. In praxis, this means that contract design is not trivial, and I hope that my work can give some first guidance on this matter.

This paper also contributes to the empirical literature on management myopia. Various effects of managerial horizon have been described by the theoretical literature.[2] However, the empirical literature on management horizon is scarce. The main challenge for empirical studies of horizon problems is deciding where to draw the line between short- and long-term behavior.

Previous empirical work has used explicit, not necessarily exogenous dates to mark CEO horizon; examples include the actual termination or retirement date (Dechow and Sloan, 1991; Gibbons and Murphy, 1992; Murphy and Zimmermann, 1993; Antia, Pantzalis, and Park, 2010), investment stages (Baker, 2000), and years in office (Kaplan and Weisbach, 1992; Gao, 2010). From a different viewpoint, the compensation literature studies horizon-enhancing provisions

[2] See Narayanan (1985), Stein (1988), Stein (1989), Bebchuk and Stole (1993), Noe and Rebello (1997), Chemmanur and Ravid (1999) and Bolton, Scheinkman, and Xiong (2006).

such as restricted stock and options, and explicit long-term performance plans (see Cadman and Sunder, 2007; Dahiya and Yermack, 2008).

The employment contract dataset has four important advantages. First, it allows me to study the changes in CEO behavior during his or her tenure. In other words, it provides a change in CEO horizon as well as variation within firms and within CEOs. Second, I can use these data to assess the performance effects of varying contract lengths. This enables an analysis of the overall impact of contract length on firm value. Third, I can use the differences in the judicial treatment of contract types to control for endogeneity. Finally, and most important, contract horizon provides an *ex ante* measure of horizon.

The paper proceeds as follows. Section I describes the data. Section II identifies determinants of the choice between contract types, which allows me to control for any selection bias. Section III compares contractual horizon to the actual time CEOs remain in office. Section IV presents the results on the effect of horizon on investment; Section V analyzes the effects of horizon on profitability. Section VI discusses robustness and Section VII concludes.

I. Data

A. Sample

I use a sample of employment contract terms between US firms and their CEOs. In the US, the Securities Exchange Act of 1934 requires the disclosure of all contracts deemed to be "material" (Overdahl, 1991). This includes all management contracts that are material in amount or significance (17 C.F.R. 229.601). Following Schwab and Thomas (2005) and Gillan et al.

(2009), I collect contracts and descriptions of terms from *The Corporate Library* and SEC filings.

This yields 3,717 employment contracts or summaries of employment terms. Almost all the sample documents are explicit executive employment contracts or a summary of employment terms; 192 (1%) of them are, instead, explicit retention or renewal agreements that contain the terms of the original agreement in addition to the terms of renewal. I recover the terms of both agreements for these CEO employment relationships after verifying in *BoardEx* that the CEO was employed in the previous term. A smaller proportion of the sample (less than 1% of the documents) are agreements that have been negotiated following a change in control, compensation agreements that contain the original contract terms and offer letters that have been confirmed by the CEO. I exclude agreements that have not yet been valid (e.g., applicable following a change in control) and offers that have been rejected. I obtain separation dates from *Execucomp*, *Risk Metrics*, or *BoardEx*. I also exclude contracts for which I can find no real expiration date or verify that the CEO is still in office.

Note that not all CEOs sign explicit employment contracts: Gillan et al. (2009) report that fewer than half of the CEOs of S&P 500 firms do. These CEOs are *de facto* under at-will employment. I address sample selection issues in Section VI. My results remain similar when I include CEOs for whom I do not collect contracts for my sample, assuming that they are employed at-will.

B. Descriptive Statistics

Panel A of Table I reports a breakdown of the sample by year. The sample contains 3,717 contracts starting during the period 1989-2008, of which most are dated between 1996 and 2008. The contracts involve 2,371 firms (Panel B reports a breakdown of the contract number per firm). I obtain one contract for 1,299 of the sample firms, two contracts for 705 firms, and more than two contracts for 367 firms.

TABLE I HERE

This procedure yields a sample similar to the COMPUSTAT population in the sample period. The average firm size in terms of book assets is $1,182 million, compared to the average non-sample firm size of $1,268 million (Panel C). Return on assets (ROA) averages 0.9% for the sample, compared to -2.3% for the non-sample firms. The proportion of the sample represented by each state (Panel D) is almost identical to the distribution of the COMPUSTAT population.[3]

The governance characteristics (reported in Panel E) are comparable to those in the samples used by Gillan et al. (2009) and Schwab and Thomas (2005).[4] The average age of a CEO is 52 years, and he or she has already been in office for four years. He holds 3% of voting shares and earns a base salary of $0.5 million per year; 51% of his total benefits are in the form of incentive pay. About half of the CEOs also hold the position of chairman of the board. Although CEOs starting fixed-term contracts have a significantly higher tenure than those who start at-will contracts, there are no significant differences in the other governance or compensation characteristics between contract types.

[3] Our results are similar when we exclude California, the state most frequently represented in our sample.
[4] Gillan, Hartzell, and Parrino (2009) describe a sample of 184 explicit contracts for S&P 500 companies that were in place in 2000. Schwab and Thomas (2005) use a sample of 375 contracts starting between 1984 and 2003.

I provide a breakdown of the sample by year and type in Panel A. About 22% of the sample contracts are at-will, compared with 15% of the Schwab and Thomas (2005) sample. At-will contracts were not popular in the years immediately preceding 2000, the year in which Gillan et al. (2009) collected their sample. For instance, of the 252 contracts in the sample that started in 1999, only 36 (14%) were at-will (*cf.* 13% of the Gillan et al. (2009) sample). I define contract *length* as the number of years between the start and expiration year; Panel F shows the breakdown of the sample by contract length. Following the approach of Gillan et al. (2009), I consider the length of at-will contracts to be zero. Most contracts with specified expiration dates have a length of between one and five years. Three-year contracts are the most common (33%).

I track the performance of the sample CEOs up to expiration, as long as they do not leave office. Thus, the 3,717 contracts result in an unbalanced panel of 12,202 firm-year combinations for which there are data on employment terms. Table II shows summary statistics for firm-year combinations. Of the 12,202 years, 30% are under at-will contracts.

TABLE II HERE

Over the course of their employment, CEOs with fixed-term contracts are more likely to become chairman of the board ($t = 3.1$) than CEOs under at-will contracts, and their firms have a worse governance index ($t = 2.8$). This suggests that CEOs have more bargaining power under fixed-term contracts. CEOs under at-will contracts, on the other hand, earn more incentive pay ($t = -3.1$). Note, however, that the fraction of unexercisable options is not significantly different between CEOs with and without at-will contracts. Compensation sets incentives in addition to the contract horizon. I will discuss their effects in Section VI.

II. Determinants of Contract Type and Length

One main concern is potential endogeneity of performance and the choice of contract type and length. For example, firms with no investment opportunities may not care about potential underinvestment and choose shorter contracts to take advantage of their flexibility. Alternatively, firms with a strong investment culture may also be less concerned about underinvestment and use shorter contracts because they make it easier to fire the CEO at a moment's notice. Estimation strategies that do not control for differences in investment potential will erroneously attribute lower investment to the contract type only. The following section addresses this concern. I start with a discussion of the legal implications of contract types, discuss estimation strategies and then introduce determinants of the contract choice.

A. At-will versus Fixed-term Employment

In the US, employment can be fixed-term or at-will. Under at-will employment, both the employer and the employee can terminate the relationship for "good cause, for no cause, or even for cause morally wrong, without being thereby guilty of legal wrong".[5] In other words, at-will employment can be terminated at any time. One example is Ms. Fiorina's 1999 contract with Hewlett-Packard:

> *Executive and the Company understand and acknowledge that Executive's employment with the Company constitutes "at-will" employment. Subject to the Company's obligation to provide severance benefits as specified herein, Executive and the Company acknowledge that this employment relationship may be terminated at any time, upon*

[5] Payne vs. Western & Atlantic Railroad Co., 81 Tenn. 507, 519-520, 1884 WL 469 at *6 (September Term, 1884).

written notice to the other party, with or without Cause or Good Reason and for any or no cause or reason, at the option of either the Company or Executive.[6]

These provisions do not imply that termination is without costs, but that dismissal is equally costly at any time from a legal point of view.[7] In the case of Ms. Fiorina, the contract specifies the amount and composition of severance pay for all of the mentioned cases (with cause, without cause, etc.).

In contrast, under fixed-term contracts, only early termination leads to severance pay. As an example, take Mr. Mack's 2005 five-year contract with Morgan Stanley:

> *If, during the Employment Period, the Company shall terminate the Executive's employment other than for Cause, death or Disability or the Executive shall terminate employment for Good Reason: (i) the Company shall pay to the Executive in a lump-sum cash payment as soon as practicable after the Date of Termination the aggregate of the following amounts:*
>
> > *…an amount equal to the product of (1) the Executive's Total Compensation for the most recently completed fiscal year and (2) the greater of (x) a fraction, the numerator of which is the number of days from the Date of Termination through the fifth anniversary of the Effective Date, and the denominator of which is 365 and (y) 1.[…]*[8]

Hence, in Mr. Mack's case, the cost of dismissal prior to contract expiration is proportional to the number of years remaining until the contractual termination date. The total compensation of Mr. Mack was $45 million in 2006, the first anniversary of his employment contract, and so a

[6] Hewlett-Packard Co., Form 10Q, filed September 20, 1999, Exhibit 10 (gg).
[7] The cost of termination is not necessarily confined to severance. Additional cost, e.g., reputation cost, may change over time, but there is no reason why they should differ across contract types.
[8] Morgan Stanley, Form 8K, filed September 22, 2005, Exhibit 10.

severance pay in 2006 would have exceeded $182 million. Assuming that compensation remains at this level, a severance pay in 2009 would have been $45 million.[9]

B. Estimation Strategy

To address endogeneity between the choice and the effect of contract types, I use the following strategy. First, to compare at-will and fixed-term contracts, I take an instrumental variable (IV) approach. With this method, the exogenous variation (for the contract type decision) provided by the instrument is used to limit exposure to endogeneity bias. I use differences in the legal environment across states as the instrument and describe this variable in greater detail in the next section.

To implement the IV approach, I estimate the following two-stage least-squares (2SLS):

$$Contract\ type_i = \alpha_I + \beta_I Instrument_i + \varepsilon_{1i}\ , \tag{1}$$

where the dependent variable is the type of contract *i*. I use a least-squares approach because the alternative of using probit estimates to generate first-stage predictions could introduce inconsistency (Angrist and Krueger, 2001). I then use the predicted values for the second stage:

$$Performance_{i,t} = \alpha_{II} + \beta_{II} Predicted\ contract\ type_{i,t} + X'\ Control\ _{i,t} + \varepsilon_{2i,t}\ , \tag{2}$$

where performance is *ex post* tenure, investment, profitability, and firm value, respectively, in year *t* under contract *i*. Control variables are listed in the respective sections.

Second, to track performance of CEOs over time and compare their behavior in terms of more versus less time remaining to contract expiration, I exclude at-will contracts. To control for

[9] A further discussion of severance pay is beyond the scope of this paper. For details, see Rusticus (2006), Rau and Xu (2009) or Goldman and Huang (2010).

the selection bias arising from this non-random exclusion, I follow the approach of Heckman (1979).

This procedure does not control for the choice between contracts of different lengths. To address this concern, I repeat the analysis with the sample of five-year contracts. For this purpose, I follow Gillan et al. (2009) and view contract length as a continuum with at-will contracts at one end and five-year (or longer) contracts at the other. This allows me to estimate the probability of choosing a five-year contract as opposed to all other (including at-will) contracts with the first-stage specification described previously. The obvious shortcoming of this approach is that it restricts me to the subsample of five-year contracts.

C. At-will Exceptions: Legal Differences across States

I use differences among states in the judicial treatment of dismissals as an instrument to address endogeneity in the choice of contract type. The listing of at-will exceptions comes from Walsh and Schwarz (1996) and Muhl (2001) and is reported in the Appendix. The variance of treatment has historical roots: between 1960 and 1980,[10] various states started to accept exceptions to the at-will rule. In particular, states that recognize the *exception of good faith and fair dealing* require that dismissal decisions be subject to a "just clause" standard: terminations made in bad faith or motivated by malice are prohibited.[11] This affects the choice of contract type. The more

[10] The debates that led to the current pattern in state enforcement rules were driven by political sentiments but also by the particularities of single, precedent cases. Most of the process transpired one or two decades before the time of the sample – decades that witnessed non-trivial changes in the American political landscape.

[11] Under the public policy exception, dismissal is not allowed if it violates the state's public policy or a statute. Under the implied contract exception, an employee can dispute his/her dismissal if he/she can prove the existence of an implicit (i.e., not written) contract. These two exceptions are less relevant in the case of CEOs, whose employment contracts are usually quite detailed.

employee-friendly court treatment of at-will contracts lowers the perceived cost of an at-will contract for the employee, making it a more attractive option. As a consequence, at-will contracts become more common in the state, reinforcing the ease of implementing an at-will contract for the firm. This preference allows me to use the at-will exception as an instrumental variable for the contract type choice.

A valid instrument should satisfy two criteria. First, it should have a clear effect on the choice of contract type. In my sample, firms based in states that adopt the *good faith and fair dealing* exception are significantly more likely to offer at-will (t = 6.63) and shorter contracts (t = 4.96). On average, in states with a *good faith and fair dealing* exception, 30% of all contracts are at-will, as opposed to 19% in non-exception states. Furthermore, the exception should be associated with investment only because it affects the contract type (exclusion). Supporting this criterion, the exception is only weakly correlated with investment levels: its correlation with capital expenditure (normalized by sales) is only 1.1%; the correlation between *growth* in capital expenditure and the exception is 3.8%, and the correlation between the number of patents issued (between 1977 and 2004)[12] and the exception is 8%. For example, California, the state with the highest number of patents, has a *good faith and fair dealing* exception, while New York and Texas, the next active states, do not. The exception treatment developed over time, but development ended for almost all states about two decades before the sample starts. A third concern for its validity is its potential effect on the character of the CEO contract itself. If at-will exceptions state CEOs had a larger severance pay and longer tenures, at-will and fixed-term

[12] I obtain the number of patents issued by state from the United States Patent and Trademark Office.

contracts would be more similar in at-will exception states. However, the size of severance pay does not affect the difference in the horizon of contract types. Expected severance under fixed-term contracts decreases in time, while it does not change with time under at-will contracts, regardless of the expected *amount* of severance. The expected tenure of at-will CEOs is not different between exception and non-exception states (t = 1.47). This is likely because CEO contracts themselves provide better protection than the agreements of rank and file employees, making the state exception rather secondary in actual court cases.

D. Other Determinants of Contract Type

The legal environment is not the only determinant of the contract type. Gillan et al. (2009) argue that companies operating in an uncertain environment prefer to limit the potential costs of breaking a contract by offering only short-term contracts. This reasoning reflects not only the company's but also the CEO's perspective. It is costly for both parties to modify or break a contract because each has made an up-front investment in the relationship. I use Gillan et al. (2009)'s risk measures, industry volatility of sales, survival rate, and homogeneity. The latter is based on the depth of the managerial labor pool. Firms that compete in homogeneous industries can draw from deeper pools of CEO talent (Parrino, 1997). I calculate industry homogeneity as the industry median of the variation in monthly stock returns that is explained by an equally weighted industry index.

Executive and governance characteristics can also affect the choice of contract type. For instance, executives may prefer fixed-term contracts for stability. If this is true, then executives with prior commitment to a firm will more often have fixed-term contracts. I measure

commitment by tenure and a variable that indicates incumbent CEOs. CEOs may want to match their own career horizon with the contract horizon; I use the CEO's age to measure this effect. Firms with better governance in place may need less flexibility of dismissal and care more about long-term shareholder value instead. To control for corporate governance quality, I include the index of Gompers, Ishii and Metrick (2003).

Finally, I want to ensure that geographical effects are indeed due to the at-will exceptions and not to other legal differences across states. Because takeovers constitute a disciplining threat, Bertrand and Mullainathan (1999) argue that states with anti-takeover legislation allow for more managerial discretion. If management prefers fixed-term contracts once it has more discretion, I expect firms in states with anti-takeover legislation to choose fixed-term contracts more often. If firms try to offset lax state laws with stricter employment contracts, I expect to find more at-will contracts in anti-takeover states. The enforceability of anti-competition agreements is measured using an index developed by Garmaise (2009), who finds that labor is less mobile in states with greater enforceability. This can restrict the pool of CEO candidates and make firms more willing to offer longer-term contracts.

E. The Choice of Contract Type

Panel C of Table I reports a univariate comparison. The market-to-book ratio is significantly higher (t = 2.34) and the ROA significantly lower (t = 2.51) for firms that employ at-will CEOs. Furthermore, sales volatility is higher in firms that enter into fixed-term contracts with CEOs (t = 3.67). The other main performance variables of interest – stock returns, ratios of capital and

R&D expenditures to sales – are not significantly different between firms offering at-will versus fixed-term contracts on a 5% level.

Panel E shows the CEO and governance characteristics sorted by contract type. Firms that operate in states with at-will exceptions have a higher fraction of at-will contracts. This is consistent with the argument of the previous section and encourages me to use these legal aspects as instrumental variables. CEOs with a longer existing tenure more often sign contracts with explicit expiration terms (t = 2.54). Because CEOs with higher tenures tend to have more bargaining power, this finding indicates that the CEOs themselves prefer longer term contracts. Finally, I track the real date of separation (for those CEOs who left office before the end of 2008) and refer to the time until then as "*ex post* horizon". As conjectured, at-will CEOs remain in office for a shorter period of time (t = 2.73). Other variables are not significantly different across contract types.

Panel G of Table I reports the industry breakdown for industries with more than 100 observations. Of these industries, the one with the highest concentration of at-will contracts is the software industry (122 out of 396 contracts). This seems consistent with Gillan et al. (2009), who argue that firms with high operating risks prefer to limit their contract risk by offering shorter contracts. The industry with the highest concentration of fixed-term contracts is the banking industry (485 out of 548 contracts).

TABLE III HERE

Table III reports the multivariate results. I start with a probit specification in which I predict the choice of contract type based on the state indices (column 1). First, states with an at-

will exception for *good faith and fair dealing* are 25% more likely to issue at-will contracts (t = 4.22). This is consistent with my previous argument and with the findings of Miles (2000). Other at-will exceptions are not significantly related to the proportion of at-will contracts. I do not find a significant relation between at-will contract prevalence and either Bertrand and Mullainathan's (1999) index based on anti-takeover legislation or Germaine's (2006) index based on anti-competition enforcement.

Second, I find that CEOs with a longer existing tenure are more likely to choose fixed-term contracts (t = 2.34, column 2). This suggests that CEOs are indeed rewarded with a more stable contract after they have worked in the position in a previous term. The Gompers et al. (2003) governance index is also significantly related to the choice of contract type (t = 2.60), albeit not in all specifications. Firms with better governance are more likely to choose a fixed-term contract. The indicator for former CEOs is not significantly related to contract type, and neither is the CEO's age. I confirm the finding of Gillan et al. (2009) that operating risk is relevant for the choice of contract type (column 3). Firms in industries with higher sales volatility are more likely to offer an at-will CEO contract (t = 1.94), albeit only at a 10% significance level and not across all specifications. There is no significant relationship between the choice of at-will contracts and any of the other risk measures. Larger firms and firms with more cash are more likely to choose at-will contracts (t = 3.91 and 6.15), consistent with the argument that the ease of dismissing CEOs under at-will employment can mitigate entrenchment. This finding is particularly relevant for larger and cash-rich firms, whose CEOs have more

flexibility (see Jensen, 1986; Harford, 1999). The coefficient on CAPEX is not significant. The results on tenure and the exception remain similar when controlling for industry fixed effects.

To compute the Lambda for the Heckman (1979) selection model between contract types, I use the regression reported in column 5 of Table III. For the analysis of contract types, I use a least-squares approach in the first stage because probit estimates could introduce inconsistency (Angrist and Krueger, 2001). I report the ordinary least squares (OLS) regression results for the first stage in column 6. Results do not change significantly from the reported ones when we include second stage variables into the first stage regression to ensure consistency.

III. Contractual Horizon and Realized Tenure

Contract terms matter in my sample. Of the 27% of fixed-term contracts that are terminated before their expiration year, only 2% of the sample is terminated before the first renewal year, another 9% are terminated in the renewal year, and 15% leave between renewal and expiration date.

To examine the relevance of contract horizon in more detail, I compute the actual remaining horizon as the difference between the actual termination and the current year. This is possible only for executives who left their position before 2009, which leaves me with 6,285 firm-year observations.

Figure 1 plots the distribution of realized tenure by contract type. The realized tenure of at-will contracts is similar to that of fixed-term contracts in the last year. Over 20% of both groups terminate within the current year, and a further 20% of both terminate within the following year. This is in stark contrast to contracts with more than five years remaining. Of

these, only around 10% terminate within the current or following year. Note that there is termination before contractual end. Over one third of the contracts with over five years remaining terminate before time. In other words, five-year contracts not always translate into five-year terms, but a longer horizon than a one-year or at-will contract.

TABLE IV HERE

To estimate the effect of contractual horizon more precisely, I regress the *ex post* horizon on the at-will indicator and the number of remaining years, respectively. Table IV, column 1 shows the results of an OLS regression including all CEOs. At-will contracts are significantly associated with a shorter realized tenure (t = -2.64). In the next column, I instrument the at-will indicator with the legal and risk-related variables described in the previous section. Again, the (instrumented) at-will contract is significantly negatively related to realized tenure (t = -3.96). On average, at-will CEOs stay two years less than CEOs with fixed-term contracts. Note that the coefficient's magnitude is larger here than in the OLS specification: the choice of at-will versus fixed-term contracts is endogenous with regard to the expected length of the contract. The F-statistic of 40.46 indicates that the instrument is not weak.

In column 3, I report the results of a regression using only CEOs under fixed-term contracts. To control for selection bias, I include the Heckman's lambda of the contract type choice. The specification is the same as in column 1 except that I replace the at-will indicator with the number of years remaining under the contract. The number of remaining years is significantly positively related to the actual remaining tenure. The coefficient is 0.3, which means that CEOs with every further year under contract can expect to stay four months longer.

This sample excludes executives who were still in office at the end of 2008; hence, my sample is biased toward CEOs who left office earlier.

Re-elected CEOs can expect to stay in office significantly longer. CEOs with a higher (historical) tenure have a higher future tenure (although this relation is not significant under the instrumented specification). These CEOs usually have a longer relationship with the board, which can alleviate potential information asymmetry with respect to the CEO's experience but also increase their bargaining power. Younger CEOs stay longer in office, and turnover is higher for larger firms.

IV. CEO Horizon and Investment

A. Motivation

A short time horizon ("myopia") implies that its holder prefers payoffs that materialize soon. When uncertainty about the quality of a project only resolves after a longer period of time, potential rewards can come too late to motivate the short-term oriented executive. This can reduce the incentives to invest into long-term projects. This has been discussed, among others, by Gopalan et al. (2010), Bolton et al. (2006), Chemmanur and Ravid (1999), Stein (1988) and Stein (1989).

This paper uses the expiration of employment contracts as a measure for the time horizon of CEOs. At the expiration of an employment contract, the board can replace a CEO at a lower cost than at any other time. This increases the probability of turnover for the CEO, thereby effectively reducing his time horizon.

Employment horizon can affect incentives in several ways. Gibbons and Murphy (1992) argue that executives with a short horizon have less motivation because their performance has little chance of affecting future compensation. Dahiya and Yermack (2008) show that long-term incentive pay often vests upon termination. A high probability of termination thus reduces the motivating effect of long-term incentive and future compensation. In addition to monetary incentives, the end of employment also makes it harder to assign responsibility to actions. In this context, Matta and Beamish (2008) argue that CEOs prefer to build their "legacy" rather than contribute to the legacy of others.

A disincentive to invest under a short horizon is not necessarily suboptimal. On the one hand, an executive with a short horizon has little incentive to exert the effort necessary for starting a long-term project. On the other hand, he also has little incentive to exert effort to work on the long-term project, even if started. In addition, lower-rank executives may have to reverse decisions under new leadership. Thus, they have incentives to reduce effort while waiting for a probable succession.[13] Therefore, *given* a short CEO horizon, it can be optimal for the firm to not invest ("under-invest") into NPV-positive projects.

One example of suboptimal myopic underinvestment, however, is described in the signal jamming model of Stein (1988): under information asymmetry between the stock market and the management, a CEO sends costly signals that enhance the market's assessment of his skills. In the case of contract expiration, a CEO who seeks to increase the probability of re-election can have the same incentive to enhance the board's opinion of him. Because the probability of re-

[13] For a more qualitative discussion of organizational and psychological biases, see Laverty (1996) who provides an overview of the literature in the management area on myopia.

election is less than one, the potential cost of such actions is less important to him than to the firm.[14] A similar argument has been made by the political science literature in the context of presidential elections.[15]

Underinvestment is not the only potential outcome of a short executive horizon. Bebchuk and Stole (1993) argue that in another informational setting, the CEO might want to overinvest when only he knows that a project is unproductive. Chevalier and Ellison (1999) describe excessive risk taking in the context of mutual fund management. These authors find that in the last quarter before an annual evaluation, mutual fund managers with greater career concerns take riskier positions than during the rest of the year. According to Noe and Rebello (1997), boards prefer not to change managers in the middle of complex, long-term projects. Therefore, managers can increase the probability of re-election by making themselves indispensable with regard to specific investments.

The latter arguments suggest that myopic CEOs have the incentive to overinvest. To evaluate the over- and underinvestment hypotheses, I regress investment spending on managerial horizon variables. If a short horizon leads to underinvestment, I expect CEOs with expiring or at-will contracts to invest less than their peers. If career concerns encourage CEOs at evaluation time to take on risky or unproductive projects, I expect investments to be higher than usual at such times.

[14] Unlike other employees, CEOs rarely take up comparable positions after contract termination. Only 6.3% of the sample CEOs become CEOs of another firm. This is comparable to the Gibbons and Murphy (1992) sample (2.2%) or the Brickley, Linck and Coles (2009) sample (3.2%). It therefore seems unlikely that a CEO would prefer to terminate his contract sooner than the firm would like to.

[15] See Nordhaus (1975), Lindbeck (1976), Alesina, Roubini and Cohen (1997) and Grier (2008).

B. Empirics

Figure 2 shows as initial evidence the average investment by number of remaining years for three-, four- and five-year contracts. Panels A and B show capital and R&D expenditures, respectively. Overall, investment declines with the horizon, an effect that is most pronounced for contracts with an initial length of four years. Four-year contracts exhibit comparatively high investment in the first year.

I regress investment spending on the horizon variables, controlling for variables that previous literature has shown to be relevant for investment. As is customary, the dependent variable is normalized by sales and adjusted for the industry average.[16] I start with an analysis of the relation between investment and expected horizon, track CEO behavior over the duration of their tenure to measure the effect of the remaining contract horizon, and finally compare the effects of different contract types.

I repeat all regressions with R&D expenses. Because R&D expenses have a direct impact on profitability whereas CAPEX do not, I expect the effect on R&D expenses to be stronger if CEOs underinvest to boost their earnings (Dechow and Sloan, 1991; Ghosh, Moon and Tandon, 2007).

The literature shows that a number of variables affect investment. Following Polk and Sapienza (2009), I use the market-to-book ratio as a measure of investment opportunities as well as mispricing, and the price of invested capital and discretionary accruals as a measure of the latter. I include the first two lags of the market-to-book ratio and construct discretionary accruals

[16] Note that this variable differs from the non-adjusted numbers shown in Figure 2.

using the methodology of Jones (1991). Financing constraints can limit investment. Following Almeida and Campello (2007), I control for cash flow (normalized by the capital stock), asset tangibility and the interaction between the two. I further use the five-variable version of equity dependence using the index developed by Kaplan and Zingales (1997) following the argument of Baker, Stein, and Wurgler (2003) and control for leverage. I use ROA to control for profitability and the log of assets to control for size. Wahal and McConnell (2000) show that institutional investors encourage firms to invest more. Following their methodology, I obtain the fraction of institutional investors from *Thomson Reuters*. Firms that encounter more risk may be reluctant to make large investments. I include the firm's idiosyncratic risk (Wurgler and Zhuravskaya, 2002) to measure firm-specific risk and the industry median sales variance to measure industry-specific risk. To control for corporate governance quality, I include the index of Gompers et al. (2003) and an indicator variable set equal to 1 only if the CEO is also the chairman, since this allows him more flexibility. I control for the CEO's age and tenure to capture horizon-unrelated effects that may be correlated with the contract horizon, such as the near-retirement effects documented by Gibbons and Murphy (1992). Finally, I include year-fixed effects.

B.1. Expected Horizon

As a first indication, I regress investment on "expected horizon". I calculate the expectation by regressing the actual remaining time in office on the contract terms, as described previously. Note that this procedure reduces the sample by contracts that have not ended in 2008. I conclude that the expected horizon matters (Table V, Panels A and B, column 1). One further expected year corresponds to CAPEX (R&D) exceeding the industry average 0.8 times (t = 1.78) and 0.61

times (t = 3.53), respectively. This represents 52% (29%) of one standard deviation or 2.20 (1.64) of the mean of the dependent variable.

TABLE V HERE

B.2. Contract Length

Next, I study the investment behavior of CEOs under fixed-term contracts (Panels A and B, columns 2 and 3). I exclude firms with at-will CEOs and control for the selection of at-will contracting as described in Section II. To eliminate potential bias from a higher number of observations of longer contracts, I repeat the analysis with only five-year contracts (column 3).

For fixed-term CEOs, investment decreases over the course of a contract, especially in CAPEX. Firms invest more when the CEO contract has a higher number of remaining years (t = 3.69). One more year remaining translates into 3% higher CAPEX over the industry average. The effect is more pronounced when I restrict the sample to five-year contracts. One more year remaining, given an originally five-year contract, translates into 4% higher CAPEX over the industry average (t = 2.87). In other words, CEOs spend 20% more on CAPEX in the first year than in the last year of a five-year contract. The results are similar, but weaker for R&D expenses (see columns 2 and 3 in Panel B of Table V). The effect of the number of remaining years on the general sample, at 2%, is comparable to the effect on CAPEX (t = 2.05). The coefficient is not significant in the five-year contract sample (t = 0.74).

Is the horizon effect on investment rooted at the beginning or at the end of the contract? Panel C of Table V reports the results of a regression which includes indicator variables for the number of years remaining. Other than that, the specification remains as previously described.

The horizon effect on investment is most pronounced in the last two years before contract termination. Investment is lower by 9% in the last year and 8% in the second-to-last year ending before the contract. This indicates that CEOs would rather invest less at the end than more at the beginning of their contract.

B.3. Contract Type

This section compares the effects of at-will versus fixed-term contracts. Column 4 of Table V reports the results of an OLS regression of investment over the at-will indicator. At-will CEOs invest significantly less than their peers (t = -2.19). Given that endogeneity is a main concern in this setting, I repeat the analysis in column 5 with an instrumented at-will indicator.

Consistent with the underinvestment hypothesis, the instrumented at-will indicator is significantly negatively associated with investment. On average, an at-will CEO spends 0.77 less on CAPEX and 1.21 less on R&D expenses than his peers (column 3 of Panel B). Note that the investment measures are not significantly different between firms in the year prior to the employment agreement. All the sample firms start out with a similar investment policy, but firms with at-will CEOs subsequently decrease their investments. In the first stage, the instrument is significant ($p < 0.01$) with an F-statistic of 16.45. The instrumented approach is relevant because according to a Hausman test ($\chi^2 = 69.61$, $p < 0.00001$), the instrumented coefficients are significantly different from the OLS estimates. Note that the coefficients estimated with the instrumented variable are higher than those estimated with an OLS regression. This indicates endogeneity between investment and the choice of contract type: firms with fewer investment opportunities draw up more fixed-term contracts.

B.4. Control Variables

The coefficients of tenure and age are not significant and inconsistent in most regressions. The CEO's tenure is positively significant in one CAPEX specification and one R&D specification, but negatively significant in another R&D specification. Age is significantly negative in two R&D specifications, but insignificant in all CAPEX specifications. These results make it difficult to draw overall conclusions on these alternative horizon measures.

With respect to the other control variables, firms invest more when they are smaller, when their market-to-book ratio is higher, when they are less levered, have less idiosyncratic risk, and when their fraction of tangible assets is higher. This is consistent with the existing literature: smaller firms and firms with a high market-to-book ratio have greater growth opportunities. Firms with less leverage, a higher fraction of tangible assets and less idiosyncratic risk can finance their investment more easily. More institutional ownership translates into significantly higher CAPEX, consistent with Wahal and McConnell (2000). The coefficients on accruals are negatively significant for some specifications but economically small, and the coefficients on profitability are negatively significant but not for the CAPEX regressions. Other coefficients are small and insignificant or change their signs.

C. Discussion

My evidence supports the underinvestment hypothesis. CEOs with a longer expected horizon invest more than their peers, a finding that applies both to at-will CEOs and to CEOs whose fixed-term contracts are close to expiration. It applies to both R&D and capital expenditures,

which suggests that signaling is not the only motivation. I find no evidence for an effect of tenure or age, or overinvestment.

V. Contract Horizon and Profitability

Why do CEOs with at-will contracts invest less than their peers? In the signal jamming model of Stein (1989), CEOs facing a turnover threat want to boost their current performance. They forgo long-term investments to avoid spending earnings that can serve to signal quality instead. In contrast, CEOs with a long horizon do not have an incentive to send signals and therefore should not underinvest. Given the same underlying distribution of profits, the earnings management hypothesis thus predicts that CEOs with a shorter horizon perform better in the short term. As an alternative explanation, CEOs with short horizons may cut investment because they do not have an incentive to exert effort when rewards will not arrive before their horizon ends. If this argument is true, we do not expect to see significant relations between CEO horizon and profitability.

To test these hypotheses, I regress ROA on the previously defined measures of contract horizon.[17] I use the set of control variables identified in Chen, Harford and Li (2007). Larger firms have more economies of scale and market power and thus should be more profitable; hence, I control for firm size by including the log of book assets. By the same argument, competition can reduce profitability within an industry, so I control for industry structure with the Herfindahl index. Market valuation incorporates beliefs about a firm's earnings

[17] I calculate ROA as EBIT (earnings before interest and taxes) over assets. Using EBIT as opposed to net income has the advantage of not being affected by differences in the firms' capital structure decisions.

opportunities. I add the lag of Tobin's Q to account for the firm's opportunity set. I control for leverage. Chen, Harford and Li (2007) argue that institutional shareholders achieve better decision making by monitoring and document a positive relationship between institutional ownership and profitability. I control for the fraction of institutional ownership as documented in the *Thomson 13F* database. I control for the governance provisions mentioned previously: the Gompers et al. (2003) index; an indicator variable for Chairman-CEOs; and the executive's age and tenure. Finally, I include industry and year fixed effects. As before, I instrument the at-will indicator and include Heckman's lambda from the contract selection stage when conducting regressions that exclude at-will contracts.

TABLE VI HERE

The results are shown in Table VI. Contrary to Stein's (1989) prediction, firms with shorter-horizon CEOs are not more profitable. The number of expected years in office is, on contrary, positively related to the ROA (t = 2.03, column 1). The effect is less pronounced when we focus on the fixed-term contracts. The magnitude of the coefficient is rather low and only significant – and here, also only on a 10% level – for the subsample of five-year contracts (t = 1.94, column 3). Both the economic and statistical significance is higher for the difference between at-will and fixed-term contracts (column 5), with a coefficient of -9% on the (instrumented) indicator variable for at-will contracts (t = -2.05). The instrument is significant ($p <$ 0.01) with an F-statistic of 24.66, indicating that it is not weak. The instrumented coefficients are significantly different from the OLS estimates (according to a Hausman test, with $p <$ 0.00001).

The control variables affect earnings as follows. Firms with higher tenured CEOs are more profitable, but those with older CEOs less so. The coefficients are rather small and partly offset each other, at 0.002 for tenure and -0.001 for age. Larger, less levered firms and firms with a higher fraction of institutional ownership are more profitable, and the governance index is negatively associated with firms' earnings. This is consistent with the findings of the literature: larger and less levered firms are better able to deter entry and are therefore more likely to be profitable (Bolton and Scharfstein, 1990). Institutional shareholders can serve as monitors (Chen, Harford and Li, 2007). The governance index is inverse to governance quality. In other words, firms with more shareholder-friendly governance provisions have higher earnings, which is consistent with the argument of Gompers et al. (2003). Other variables are insignificant across most specifications or inconsistent in signs.

Overall, I do not find support for the hypothesis that CEOs underinvest to boost their earnings. If this was their intention, they did not succeed: profitability remains lower for at-will CEOs. Furthermore, firms do not become more profitable as the CEO approaches re-election. This suggests that CEOs work harder in their first years.

VI. Robustness

A. Sample selection

Many US CEOs do not sign employment contracts (see the discussion by Gillan et al. (2009)). From a legal perspective, this implies that their employment is at-will. While I do not capture all CEO employment contracts, the vast majority of the "missing" contracts are in fact non-existent

and therefore the CEOs are employed at-will. In other words, most of the firms outside the sample employ their CEOs at-will. Fixed-term CEO contracts are only missing if not or not fully reported.

I assume for this robustness check that all CEOs outside the contract sample are employed at-will. I repeat the baseline specification, the regression analysis of capital expenditure. I keep all control variables that are available in COMPUSTAT, but do not collect governance data.

TABLE VII HERE

Column 1 of Table VII reports the results. The coefficient on the at-will indicator is significantly negative (t = -3.24). At-will employment is associated with 16% lower investment over the industry mean. This is higher than the original OLS coefficient, but lower than the IV coefficient. In other words, the results are robust with the COMPUSTAT population. With the large sample, all other control variables gain significance with their expected sign.

B. Propensity Score Matching

The extended sample allows me to use another technique to test the robustness of the results: propensity score matching. The results of the baseline regression could be driven by non-linear effects of the control variables. I address this concern by creating two subsamples that are comparable for all covariates and differ only in terms of contract type (Rosenbaum and Rubin, 1983, Hirano, Imbens and Ridder, 2003). To create similar subsamples, I estimate the propensity score, the probability of treatment (at-will employment) conditional on the control variables of

the baseline specification. I then match at-will and fixed-term contracts that are similar in terms of their propensity score. Because I have many more observations under at-will employment, I can include ten similar firms under at-will employment for each firm under a fixed-term contract. Note that I add industry effects to the matching procedure. Therefore, I do not adjust the dependent variables for the industry average. This also makes it easier to compare the means.

TABLE VIII HERE

I report the results in Table VIII. In Panel A, I report summary statistics on the un-matched sample for comparison, and in Panels B and C, the comparisons between the matched samples. Note that the matched samples differ for the dependent variables because of the limited availability of R&D expenses. In the un-matched sample, firms with at-will CEO employment are significantly smaller and have lower market-to-book ratios. These differences become insignificant after the matching procedure.

The matched samples are significantly different in terms of investment. CEOs with at-will contracts invest significantly less, both in terms of capital expenditure (t = -3.63) and in terms of R&D expenses (t = -6.39). This affirms that the results are not driven by distributional differences in observed covariates between firms with at-will and fixed-term contracts.

C. Switching Firms

The contract sample contains 148 firms that switch from fixed-term to at-will contracts, 236 that switch from at-will to fixed-term contracts, and 46 that switch in both directions. In total, I obtain a “switcher” subsample with 2,190 firm-year observations, of which 739 are under fixed-

term contracts. These allow me to calculate how the same set of firms reacts to a change of contract type. In other words, I compare the average investment after the switch to the average investment before the switch. This does not completely remove the potential selection bias, but it does reduce the effect of unobservable firm characteristics.

I report results in columns 2 and 3 of Table VII. First, I regress CAPEX over sales (adjusted for industry) on the at-will indicator. I cannot use the instrument because it is time invariant. The coefficient of the at-will indicator is significantly negative, albeit on a 10% significance level. Next, I repeat the regression using fixed-term contracts only and including the number of remaining years under the contract as an independent variable. The coefficient on the number of remaining years is significantly positive. Therefore, the underinvestment effect is not entirely accounted for by unobserved firm characteristics.

D. Renewal Dates

Next, I repeat the fixed-term contracts regression using the first possible renewal date rather than the expiration date. I observe a wide range of formulations involving renewal dates. Although most contracts contain a first renewal date or several renewal dates, the commitment character of renewal dates is not clear. Discussions with lawyers and compensation consultants suggest that renewal dates do not affect severance pay, and such contracts can be renewed on any date after (or even before) their indicated renewal dates. Nevertheless, the first renewal date can serve as an early boundary of executive horizon. Column 4 reports the results of a regression using the number of years to the first renewal date as an independent variable. Indeed, the effect is

significantly positive. One year remaining before the first renewal date translates into 2.5% higher investment over industry average.

E. Fixed Effects

Performance may be affected by unobservable manager characteristics (Bertrand and Schoar, 2003). I introduce CEO fixed effects in the analysis of fixed-term contracts, as reported in columns 5 and 6 of Table VII. (I use *BoardEx* to identify CEOs who share the same name). As before, at-will contracts are negatively associated with investment, and the number of remaining years is positively associated with investment, although only at a 10% significance level.

F. Compensation

Finally, compensation and ownership incentives may alleviate the negative effects of contract horizon (Dechow and Sloan, 1991). I use data from Execucomp, RiskMetrics, and Capital IQ to control for effects of compensation and ownership. Note that compensation data are not available for a large fraction of my observations (see Panel E of Table I). To control for this lack, I include variables that indicate when such data are available. The results, which are in line with the previous findings, are reported in columns 7 and 8. At-will CEO contracts have a significantly negative effect on investment, and the number of remaining years in fixed-term contracts has a positive effect. Neither incentive pay nor voting stock ownership or the fraction of unexercisable options is able to alleviate the underinvestment problem: I find only one significant relation between compensation features and investment. In the sample of fixed-term contracts, the coefficient of incentive pay is negative and significant (t = -2.07). It is, however, economically small, at -0.06. What does have an alleviating effect is the level of compensation. The

coefficients of the logarithm of total compensation is positive and significant in both specifications (t = 5.32 in the overall and 6.55 in the sample of fixed-term contracts).

I believe that this topic merits further exploration. Although incentive pay is often associated with long-term compensation, it mostly leads to short-term cash flows and yields long-term incentives only if vesting is restricted. The percentage of unexercisable options is a better measure of option horizon, but it ignores restrictions on stock as well as details on the length of vesting periods (see Cadman and Sunder, 2007, for a further discussion). The effects of "compensation term structure" have been little researched and provide a fruitful field for future research.

VII. Conclusion

Using a dataset of 3,717 CEO employment contracts, I document that there is heterogeneity in the employment horizon of US CEOs. The data include both at-will and fixed-term contracts of different lengths. Employment contracts are not empty promises. The contractual horizon predicts the time an executive actually stays in office. CEOs with a longer remaining contract can expect a longer remaining tenure; CEOs with at-will contracts are associated with less remaining tenure.

These factors have consequences on decision making. Consistent with the predictions of myopic underinvestment models, I find that CEOs with a shorter horizon invest less. This applies to both CAPEX and R&D expenditures. I find little evidence for earnings management. Firms with CEOs of shorter horizon are, if anything, less profitable.

This is a first effort to document the effects of contract horizon. I hope that the results can give some practical orientation to both the governance literature and the contract design praxis. Also, this paper contributes to the literature on executive myopia by using an ex-ante measure of executive horizon. Consistent with the predictions of underinvestment arguments, I show that both investment and firm value decline when executive horizon becomes shorter. Finally, the choice between at-will and fixed-term CEO employment contracts does not affect firm value in a significant manner. That is, I do not find evidence for suboptimal contract design in these terms. This may give insights to another debate in the governance literature: whether executive incentive contracts are optimal or based on rent-seeking and bargaining power on the executive's side.

Given the availability of new data, I am confident that future research will illuminate various other effects, interactions, and remedies for the phenomena described in the current paper. For example, executive horizon may affect capital structure policies and decisions. Horizon may also explain time-varying risk-taking behavior, and investor horizon and executive horizon may affect each other. Understanding the interaction between compensation and horizon may further help to improve contract design. Finally, my findings on the time variation of investment may have implications for the cyclicality of investment and, ultimately, of stock prices.

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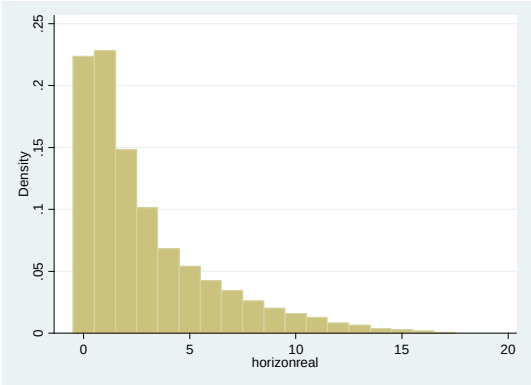
VARIABLE DEFINITIONS

Accrual	Current discretionary accrual (here "accrual" short) is the residual of a regression of current accruals on the average year-to-year sales growth in the 49 Fama-French industries. Current accrual is the year-to-year change in non-cash working capital minus depreciation. Long-term discretionary accrual is the residual of a regression of annual accruals on the average year-to-year growth in sales and PP&E in the 49 Fama-French industries. Annual accrual is the difference between earnings (before interest and taxes) and cash flow
Age	Executive's age in years
Anti-takeover	State with "business combination laws" according to Bertrand and Mullainathan (1999)
Assets	Book assets
At-will	1 when the contract is at-will and 0 otherwise
CAPEX/sales	Capital expenditures divided by sales
Cash Flow	Earnings before extraordinary items and depreciation divided by lagged assets
Chairman & CEO	1 if the CEO is also the chairman
Compensation	CEO's total annual compensation in thousands of US$
Delaware	1 if the firm is incorporated in Delaware
Ex post horizon	Year in which the executive left office minus the current year
ExecuComp data available	1 if ExecuComp data (e.g., compensation, incentive pay, unexercised option value) are available
Exception (good faith & fair dealing)	1 if the contract is governed by the law of a state with a good faith & fair dealing at-will exception
Exception (implied contract)	1 if the contract is governed by the law of a state with an implied contract at-will exception
Exception (public policy)	1 if the contract is governed by the law of a state with a public policy at-will exception
Former CEO	Indicator variable for CEOs who were in office at the time of the contract start
Fraction institutional investors	Ownership fraction of institutions as reported in the Thomson 13F database
Garmaise	Index of Garmaise (2006)

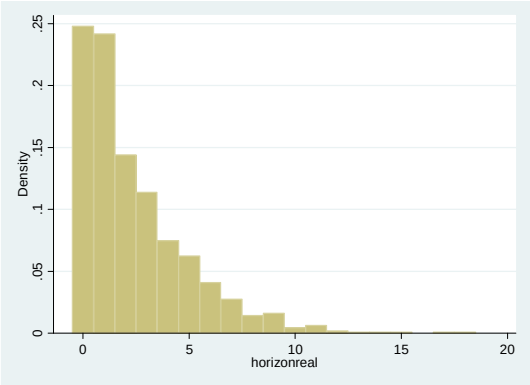
Governance index	The index developed by Gompers, Ishii and Metrick (2003)
Herfindahl	Industry Herfindahl index
Idiosyncratic risk	Standard deviation of the residuals from a regression of acquirer excess returns on the Fama and French factors (RM, SMB, HML) and the matched 49-industry portfolio return.
Incentive to total compensation	Value of bonus, stock, and option grants to total CEO pay
Industry homogeneity	Median (across all firms of one of the 49 Fama-French industries) of the percentage variation in monthly stock returns that is explained by an equally weighted industry index; market-adjusted returns are annual stock returns adjusted by the value-weighted CRSP index.
Industry sales volatility	49 Fama-French industry average of variance in sales over the past seven years
Industry survival rate	Industry rate of year-to-year survival within the COMPUSTAT database
KZ	Index of Kaplan and Zingales (1997)
Leverage	Ratio of net debt divided by assets
Market-to-book	Ratio of the market value of assets to the book value of assets: the market value is calculated as the sum of the book value of assets and the market value of common stock less the book value of common stock, cash, and deferred taxes. Market values are measured at the end of the fiscal year.
Over 60	1 if the CEO is more than 60 years old
Percent unexercisable	Value of unexercisable options divided by the value of unexercised options
Percent voting power	Percentage of voting shares held by the CEO
R&D/sales	Research and development expenditures divided by sales
remaining years	Expiration year minus current year
RiskMetrics data available	1 if RiskMetrics data (e.g., voting power) are available
ROA	Earnings before interest and taxes divided by assets
Salary	CEO's base salary in thousands of US$
Tangibility	1 minus the ratio of intangible assets to total assets
Tenure	Number of years the CEO has been in office

FIGURE 1: EX POST HORIZON

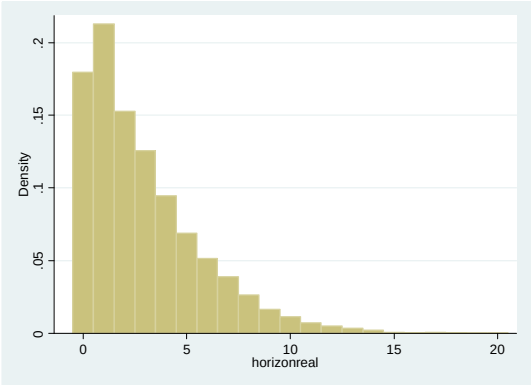
This graph shows the distribution of *ex post* horizon by contract type and the number of remaining years. *Panel A* shows the distribution of at-will contracts, *Panels B*, *C* and *D* fixed-term contracts. *Panel B* shows all fixed-term contracts, *C* all fixed-term contracts with one year or less remaining, and Panel *D* all fixed-term contracts with more than five years remaining under the contract.



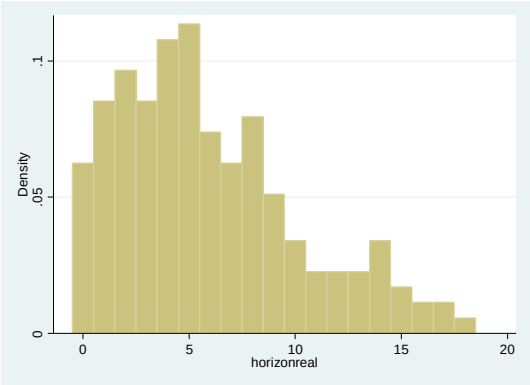
Panel A: At-will contracts.



Panel C: Less than one year remaining (Fixed-term contracts).



Panel B: Fixed-term contracts.



Panel D: More than five years remaining (Fixed-term contracts).

FIGURE 2: INVESTMENT BY CONTRACT HORIZON

This graph shows the mean investment per remaining year and contract type. *Panel A* shows the average CAPEX/sales, and *Panel B* shows the average R&D/sales.

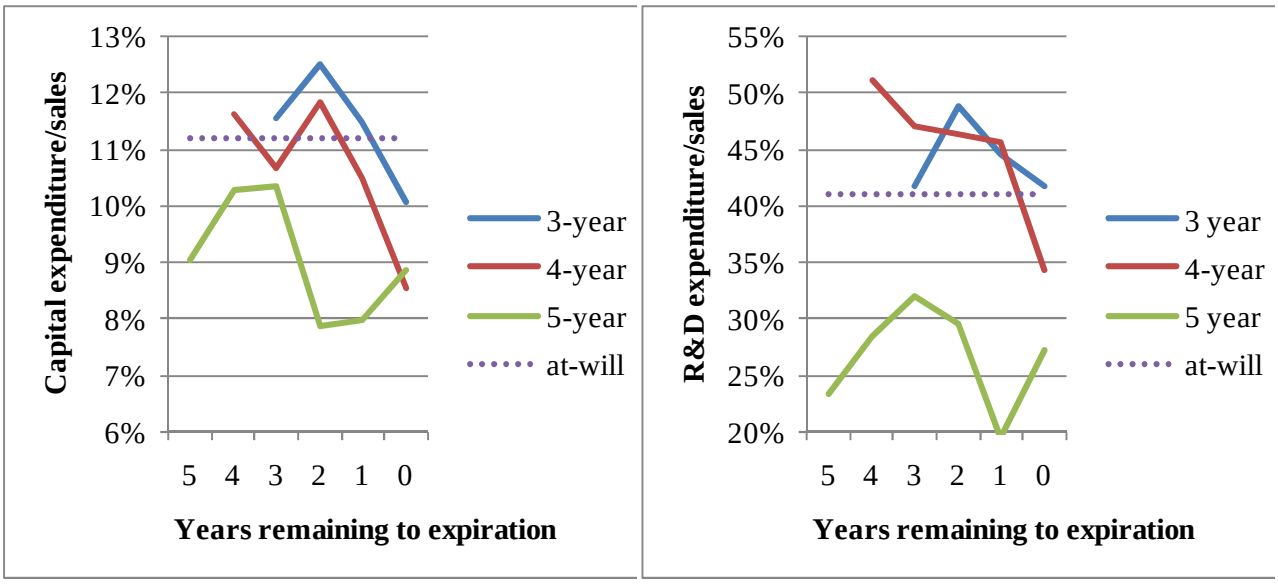


TABLE I: SUMMARY STATISTICS AT THE START OF THE CONTRACT

This table presents summary statistics of the sample contracts. *Panel A* shows the number of contracts and their average length sorted by their start year. *Panel B* shows the number of contracts per firm. *Panel C* shows average firm and industry characteristics. *Panel D* reports a breakdown of the contracts by state, excluding states with fewer than 100 contracts. *Panel E* shows average CEO and governance characteristics. *Panel F* shows the number of contracts sorted by length. *Panel G* reports a breakdown of the contracts by Fama-French 49 industry (excluding industries with fewer than 100 contracts). It reports the total number of contracts and the number of at-will and fixed-term contracts per industry. All numbers are measured in the last fiscal year ending before the start date of the contract. All numbers (except for indicator variables and discrete variables) are winsorized at the 1% level.

Panel A: Number and length of contracts per year

	Number of contracts			Average length	
Year	**Total sample**	**Fixed-term**	**At-will**	**Total sample**	**Fixed-term**
1989	3	0	3		
1990	4	1	3	2.00	8.00
1991	7	1	6	0.43	3.00
1992	10	6	4	2.70	4.50
1993	18	13	5	2.78	3.85
1994	65	45	20	2.57	3.71
1995	111	77	34	2.32	3.34
1996	181	153	28	2.91	3.44
1997	199	159	40	2.61	3.26
1998	239	179	60	2.54	3.40
1999	252	216	36	2.80	3.26
2000	303	242	61	2.57	3.22
2001	291	221	70	2.31	3.05
2002	289	241	48	2.48	2.97
2003	338	262	76	2.48	3.20
2004	367	293	74	2.43	3.04
2005	340	255	85	2.11	2.81
2006	303	233	70	2.15	2.79
2007	345	258	87	2.15	2.88
2008	52	36	16	1.88	2.72
Total	3,717	2,891	826		

Panel B: Number of contracts per firm

# Contracts	Frequency	Percent	Cumulated
1	1,299	54.79	54.79
2	705	29.73	84.52
3	241	10.16	94.69
4	80	3.37	98.06
5	25	1.05	99.11
6	12	0.51	99.62
7	5	0.21	99.83
8	1	0.04	99.87
9	2	0.08	99.96
10	1	0.04	100
Total	2,371		

Panel C: Average firm and industry characteristics by contract

	Sample *N*	Sample Mean	Fixed-term Mean	At-will Mean	t-Statistic of differences	Non-sample *N*	Non-sample Mean
Assets ($ millions)	3,715	1,181.62	1,200.33	1,116.19	0.97	87,494	1,268.18
ROA	3,653	0.9%	1.2%	-0.1%	2.51 **	85,165	-2.3%
Market-to-book	3,358	2.52	2.47	2.73	-2.34 **	75,987	2.26
Leverage	3,714	21.9%	23.5%	16.1%	5.31 ***	87,451	24.4%
Industry sales volatility	3,717	44%	43%	47%	-3.67 ***	99,978	48%
CAPEX/sales	3,398	11.3%	11.1%	11.9%	0.86	81,067	14.9%
R&D/sales	1,889	39.3%	38.3%	42.1%	-0.87	39,417	39.7%

Panel D: Breakdown by state

State	*N*		At-will		Fixed-term		COMPUSTAT distribution
CA	604	14%	212	35%	392	65%	14%
NY	373	8%	64	17%	309	83%	10%
TX	265	6%	52	20%	213	80%	7%
NJ	191	4%	28	15%	163	85%	4%
FL	190	4%	35	18%	155	82%	5%
PA	183	4%	30	16%	153	84%	3%
IL	178	4%	53	30%	125	70%	5%
MA	157	4%	45	29%	112	71%	4%
OH	147	3%	20	14%	127	86%	2%

Panel E: Average CEO and governance characteristics by contract

	N	Total sample	Fixed-term	At-will	t-Statistic of differences
Age	3,606	51.87	51.98	51.47	1.62
Former CEO	3,717	25%	25%	26%	0.98
Tenure	3,717	3.76	3.89	3.31	2.54 **
Over 60	3,717	14%	14%	13%	1.05
Percent CEO voting power	615	3.34	3.64	2.26	1.61
Salary ('000s)	2,105	500.80	498.16	510.38	-0.64
Incentive to total compensation	2,036	50.7%	50.6%	51.2%	-0.37
Percent unexercisable	877	26.4%	26.0%	27.6%	-0.65
Governance index	971	9.11	9.18	8.90	1.38
Chairman and CEO	3,537	52.3%	53.0%	49.9%	1.58
Ex-post horizon	2,938	3.87	3.99	3.67	2.73 ***
Exception (public policy)	3,717	72.8%	71.4%	77.7%	-3.61 ***
Exception (implied contract)	3,717	66.6%	65.5%	70.7%	-2.81 ***
Exception (good faith and fair dealing)	3,717	25.8%	23.2%	34.6%	-6.63 ***

Panel F: Number of contracts sorted by length

Length (years)	Frequency	Percent	Cumulated
0	842	22.65	22.65
1	329	8.85	31.50
2	508	13.67	45.17
3	1,252	33.68	78.85
4	267	7.18	86.04
5	416	11.19	97.23
6	60	1.61	98.84
7	21	0.56	99.41
8	6	0.16	99.57
9	4	0.11	99.68
10	8	0.22	99.89
>10	4	0.12	100.00

Panel G: Breakdown by industry

Industry	At-will		Fixed-term		Total
Software	122	31%	311	79%	396
Medical equipment	43	25%	139	82%	169
Chips	48	21%	191	84%	228
Drugs	69	20%	272	80%	339
Wholesale	27	18%	130	89%	146
Business services	51	18%	236	83%	286
Trading	27	14%	171	86%	199
Insurance	18	13%	106	77%	137
Communication	21	13%	131	82%	160
Oil	16	13%	101	80%	127
Retail	34	13%	225	83%	272
Banking	55	10%	485	89%	548

TABLE II: SUMMARY STATISTICS BY FIRM AND YEAR

This table presents summary statistics of the subsequent performance in the contract period. The sample contains an observation for each firm for which I have contract terms and for each year in which the contract is not terminated. *Panel A* shows average contract horizon characteristics. *Panel B* shows average firm characteristics. *Panel C* shows average firm characteristics for all firm-years of the COMPUSTAT population for which I do not have contract data. All numbers (except for discrete variables) are winsorized at the 1% level.

Panel A: Average governance characteristics by firm and year

	N	Total sample	Fixed-term	At-will	t-Statistic of differences
Chairman and CEO	12,202	53%	54%	50%	3.08 ***
Governance index	5,559	9.34	9.40	9.16	2.81 ***
Compensation ('000)	7,509	3,128	3,252	2,846	1.44
Incentive to total	12,202	31%	31%	33%	-3.06 ***
Percent unexercisable	12,202	7%	7%	7%	-0.79
Ex post horizon	5,933	2.88	2.88	2.87	0.07

Panel B: Average firm characteristics by firm and year

	N	Total sample	Fixed-term	At-will	t-Statistic of differences
Assets ($ millions)	12,202	1257.47	1287.20	1186.76	2.24 **
ROA	11,963	-3.64%	-3.83%	-3.21%	-1.04
CAPEX/sales	11,269	21.08%	20.35%	22.72%	-1.43
R&D/sales	6,317	259.88%	246.12%	286.06%	-1.40
Market-to-book	11,366	2.48	2.37	2.75	-6.66 ***
Returns	12,196	1.75%	1.52%	2.24%	-2.14 **
Leverage	12,202	21.74%	24.03%	16.28%	8.93 ***
Tangibility	11,377	86%	87%	85%	8.93 ***

Panel C: Average firm-year characteristics of sample without contracts

	N	Mean
Assets	87,494	1,268.18
ROA	85,165	-2.28%
CAPEX/sales	81,067	14.91%
R&D/sales	39,417	39.72%
Market-to-book	75,987	2.26

TABLE III: CHOICE OF CONTRACT TYPE

This table presents the marginal effects from regressions in which the dependent variable is the at-will indicator. All variables are measured in the last fiscal year ending before the start date of the contract. Standard errors are heteroskedasticity robust. Columns 1 to 5 report the results of probit regressions and column 6 the results of an OLS regression. All variables (except for discrete variables) are winsorized at the 1% level. This table shows coefficients along with *t*-statistics in parentheses.

Dependent variable		**Contract type (1 = at-will, 0 = fixed-term)**					
		(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
		Probit	**Probit**	**Probit**	**Probit**	**Probit**	**OLS**
Geography	State exception (good faith & fair dealing)	0.248***	0.323***	0.353***	0.288***	0.280***	0.105***
		(4.22)	(7.09)	(7.16)	(5.11)	(5.52)	(7.24)
	State exception (implied contract)	0.076					
		(1.42)					
	State exception (public policy)	0.027					
		(0.51)					
	Anti-takeover	-0.015					
		(-1.22)					
	Garmaise	-0.045					
		(-0.86)					
Governance	Tenure		-0.010**	-0.012***	-0.013***	-0.009**	
			(-2.34)	(-2.69)	(-2.66)	(-2.07)	
	Governance index		0.014***	0.007	-0.005	0.008	
			(2.6)	(1.39)	(-0.66)	(1.44)	
	Former CEO		-0.052				
			(-0.43)				
	Age		-0.005*				
			(-1.94)				
Risk	Industry sales volatility			0.641*	0.573	0.333	
				(1.94)	(1.5)	(0.909)	
	Industry survival rate			-0.237			
				(-0.96)			
	Industry homogeneity			0.017			
				(0.33)			
Firm	Log sales				0.057***		
					(3.91)		
	CAPEX/sales				-0.008		
					(-1.59)		
	Cash/assets				0.779***		
					(6.15)		
Industry fixed						Yes	
Constant		-0.844***	-0.606***	-0.647***	-1.209***	-0.967	0.190***
		(-11.11)	(-4.73)	(-2.63)	(-12.7)	(-1.6)	(28.28)
N		3,717	3,717	3,717	3,717	3,717	3,717

TABLE IV: CONTRACT HORIZON AND EX POST TENURE

This table presents the coefficients from regressions in which the dependent variable is *ex post* tenure. All variables (except for indicator and discrete variables) are winsorized at the 1% level. Column 2 is the second stage of a regression in which the at-will indicator is instrumented with the regression reported in column 6 of Table III. Columns 1 and 2 include all firm-years; column 3 includes only firm-years under a fixed-term contract. Standard errors are heteroskedasticity robust and clustered at the year level. This table shows coefficients, the *t*-statistics (in parentheses), and the *F*-statistic for the instrumented variable regression.

Dependent variable		**Ex post tenure**		
		(1)	**(2)**	**(3)**
		OLS	**IV**	**Heckman**
Horizon	Remaining Years			0.307***
				(5.69)
	At-will	-0.302**	-1.911***	
		(-2.64)	(-3.96)	
Governance	Former CEO	0.436***	0.499***	0.343**
		(2.99)	(4.06)	(2.58)
	Tenure	0.014*	0.013	0.016*
		(1.88)	(1.52)	(1.83)
	Age	-0.028***	-0.032***	-0.024***
		(-3.76)	(-4.5)	(-3.48)
Firm characteristics	Size	-0.111***	-0.145***	-0.096***
		(-3.96)	(-4.88)	(-5.04)
Heckman	Lambda			-0.044
				(-0.42)
Constant		4.881***	5.812***	3.636***
		(8.53)	(9.24)	(8.76)
$\mathbf{R^2}$		2%		6%
F			40.46	
N		6,285	5,801	3,527

* p<0.10, ** p<0.05, *** p<0.01

TABLE V: CONTRACT HORIZON AND INVESTMENT

The dependent variable is CAPEX/sales (R&D/sales in *Panel B*) minus the industry average. In *Panels A* and *B*, column 1 is a three-stage least-squares regression in which expected horizon is estimated via the regression shown in column 2 of Table IV. Columns 1 and 5 of *Panels A* and *B* are regressions in which the at-will indicator is instrumented with the regression reported in column 6 of Table III. The sample in Column 2 of *Panels A* and *B*, as well as *Panel C*, include all firms with fixed-term contracts; and in Column 3 of *Panels A* and *B* include only firms with five-year contracts. Standard errors are heteroskedasticity robust and clustered by year for all specifications but the one reported in column 1 of *Panels A* and *B*. In column 2 of *Panels A* and *B*, as well as *Panel C*, lambda is the Heckman's lambda from a regression where the dependent variable is one minus the at-will indicator; in column 3 of *Panels A* and *B*, from a regression where the dependent variable is an indicator for five-year contracts. Column 1 of *Panel C* adds indicator variables for the number of remaining years to the independent variables described above. Column 2 of *Panel C* includes only the indicator variables for the number of remaining years and the Heckman's lambda as independent variables. All variables (except for discrete variables) are winsorized at the 1% level. This table shows coefficients, the *t*-statistics (in parentheses), and the *F*-statistic for the instrumented regressions.

		Panel A: Dependent variable = CAPEX/Sales (industry adj.)				
		(1)	(2)	(3)	(4)	(5)
		Terminated	Fixed-term		All	
		Expected horizon	All fixed-term	5-year contracts	OLS	IV
Horizon	Expected horizon	0.763*				
		(1.777)				
	Remaining years		0.026***	0.041**		
			(3.691)	(2.87)		
	At-will				-0.061**	-0.769***
					(-2.193)	(-3.281)
	Tenure	0.000	-0.003	0.000	-0.003*	0.000
		(-0.013)	(-1.443)	(-0.089)	(-1.744)	(-0.259)
	Executive's age	0.002	-0.002	-0.003	-0.001	-0.002
		(0.137)	(-1.483)	(-0.882)	(-0.692)	(-0.985)
Control variables	*Q* (lag 1)	0.031	0.026***	0.051	0.022***	0.023***
(Investment)		(1.188)	(3.644)	(1.618)	(2.988)	(2.916)
	Q (lag 2)	-0.028	0.003	0.029	0.003	0.01
		(-1.044)	(0.49)	(1.502)	(0.797)	(1.272)
	Accrual	-0.001	-0.001***	-0.001	-0.001***	-0.001***
		(-1.592)	(-4.627)	(-1.707)	(-4.725)	(-4.84)
	Profitability	0.041	0.001	0.521	0.137	-0.031
		(0.1)	(0.007)	(1.471)	(0.838)	(-0.252)
	Size	-0.151*	-0.117***	-0.166**	-0.136***	-0.110***
		(-1.711)	(-6.05)	(-2.538)	(-9.554)	(-6.408)
Control variables	Leverage	0.306	-0.083***	-0.048	-0.053*	-0.141***
(Finance)		(1.572)	(-3.784)	(-0.297)	(-2.001)	(-4.329)
	Cash flow	-0.422	-0.054	-0.087	-0.258*	-0.17
		(-0.7)	(-0.31)	(-0.256)	(-1.97)	(-0.898)
	Tangibility	1.168***	0.475***	0.779***	0.488***	0.426***
		(2.773)	(8.404)	(4.563)	(7.389)	(4.91)
	Cash flow x tangibility	0.802	0.173	0.083	0.444**	0.266
		(1.22)	(0.747)	(0.242)	(2.164)	(1.059)
	KZ index	0.008	-0.002	-0.006	-0.003	-0.001
		(0.911)	(-0.696)	(-1.282)	(-0.756)	(-0.484)
Control variables	Idiosyncratic risk	-1.526	-2.849***	-3.217	-2.290**	-2.111***
(risk)		(-0.486)	(-4.38)	(-1.267)	(-2.446)	(-2.944)
	Industry sales volatility	-0.847	-0.423**	-0.145	-0.609***	-0.288*
		(-0.715)	(-2.727)	(-0.298)	(-3.579)	(-1.783)
Control variables	Governance index	0.029	-0.003	0.017	0.001	0.000
(Governance)		(0.429)	(-0.429)	(0.972)	(0.141)	(-0.016)
	Governance dummy	0.607	-0.275***	-0.29	-0.243***	-0.246***
		(0.873)	(-4.274)	(-1.462)	(-3.346)	(-3.072)
	Chairman and CEO	0.219	0.023	-0.102*	0.019	0.013
		(1.449)	(0.721)	(-2.092)	(0.933)	(0.367)
	Fraction institutional investors	0.237	0.153***	-0.04	0.212***	0.194***
		(0.74)	(4.631)	(-0.359)	(9.961)	(6.192)
Heckman	Lambda		-0.140***	0.076***		
			(-4.999)	(4.79)		
Constant			-0.599***	0.39	-0.232*	-0.123
			(-5.679)	(0.769)	(-1.796)	(-0.805)
Year fixed		Yes	Yes	Yes	Yes	Yes
$\mathbf{R^2}$			9%	9%	9%	
F		18.04				16.45
N		3,374	4,460	934	7,749	6,885

		Panel B: Dependent variable = R&D/Sales (industry adjusted)				
		(1)	(2)	(3)	(4)	(5)
		Terminated	Fixed-term		All	
		Expected horizon	All fixed-term	5-year contracts	OLS	IV
Horizon	Expected horizon	0.614***				
		(3.532)				
	Remaining years		0.021**	0.028		
			(2.054)	(0.739)		
	At-will				-0.132***	-1.212***
					(-3.181)	(-5.208)
	Tenure	0.01	0.007*	-0.008**	-0.002	0.001
		(0.825)	(1.832)	(-2.35)	(-0.567)	(0.506)
	Executive's age	0.004	0.001	-0.026*	-0.007	-0.012***
		(0.408)	(0.41)	(-1.931)	(-1.727)	(-3.197)
Control variables	*Q* (lag 1)	0.044**	0.022**	0.092**	0.007	0.021
(Investment)		(2.218)	(2.271)	(2.508)	(0.331)	(1.122)
	Q (lag 2)	-0.001	-0.003	-0.016	0.000	0.005
		(-0.054)	(-0.411)	(-0.476)	(0.004)	(0.392)
	Accrual	0.000	0.000	-0.001	0.000	0.000
		(-0.411)	(-1.501)	(-1.53)	(0.097)	(-0.341)
	Profitability	-1.449***	0.336***	-0.774**	-0.34	-0.370*
		(-5.283)	(2.992)	(-2.641)	(-1.557)	(-1.87)
	Size	-0.196***	-0.012	0.083	-0.303***	-0.269***
		(-3.116)	(-0.576)	(1.595)	(-10.737)	(-10.594)
Control variables	Leverage	-0.311***	0.076*	-0.355**	-0.202**	-0.367***
(Finance)		(-2.658)	(1.938)	(-2.168)	(-2.313)	(-3.399)
	Cash flow	0.026	0.599*	0.176	0.22	-0.133
		(0.063)	(1.701)	(0.56)	(0.804)	(-0.473)
	Tangibility	0.698**	0.163	0.061	0.153	-0.021
		(2.246)	(0.92)	(0.122)	(1.389)	(-0.18)
	Cash flow x tangibility	0.307	-0.175	-0.282	-0.14	0.108
		(0.669)	(-0.471)	(-0.716)	(-0.471)	(0.325)
	KZ index	-0.004	0.003	0.009	-0.005	-0.001
		(-0.534)	(1.002)	(1.302)	(-0.835)	(-0.213)
Control variables	Idiosyncratic risk	-4.321*	2.149**	-9.471*	-1.99	-0.057
(risk)		(-1.704)	(2.248)	(-2.08)	(-1.077)	(-0.03)
	Industry sales volatility	0.245	0.383**	0.605	0.364	0.905**
		(0.251)	(2.467)	(1.245)	(1.422)	(2.775)
Control variables	Governance index	-0.01	0.002	-0.003	0.017***	0.006
(Governance)		(-0.241)	(0.222)	(-0.425)	(3.528)	(0.76)
	Governance dummy	0.446	0.179	0.311*	-0.259***	-0.342***
		(1.098)	(1.541)	(2.024)	(-4.151)	(-3.355)
	Chairman and CEO	0.077	0.017	0.121	0.094*	0.053
		(0.573)	(0.339)	(0.8)	(1.95)	(1.038)
	Fraction institutional investors	-0.057	0.02	-0.256	0.162***	0.072**
		(-0.252)	(0.308)	(-1.606)	(4.305)	(2.226)
Heckman	Lambda		0.336	0.268***		
			(1.28)	(5.987)		
Constant			1.537	-0.07	0.928***	1.167***
			(0.951)	(-0.186)	(6.121)	(5.487)
Year fixed		Yes	Yes	Yes	Yes	Yes
$\mathbf{R^2}$			14%	10%	18%	
F		18.04				16.45
N		2,072	1,875	528	4,599	4,056

Panel C: Dependent variable = Capex/Sales (industry adjusted)		
	(1)	(2)
# Remaining years	With control variables	Without control variables
0	-0.092**	-0.269***
	(-2.28)	(-11.11)
1	-0.075*	-0.221***
	(-1.97)	(-11.49)
2	-0.063	-0.199***
	(-1.5)	(-7.27)
3	-0.012	-0.177***
	(-0.28)	(-4.72)
4	0.03	-0.196***
	(0.46)	(-3.63)
5	-0.016	-0.255***
	(-0.29)	(-5.89)
6	-0.098	-0.390***
	(-1.11)	(-6.9)
7	-0.106	-0.294
	(-0.33)	(-1.05)
8	-0.134	-0.550***
	(-1.11)	(-3.89)
9	0.11	-0.385
	(0.39)	(-1.48)
10	0.121	-0.469**
	(0.51)	(-2.55)
>10	Yes	Yes
Heckman's Lambda	-0.629***	-0.006
	(-4.91)	(-0.04)
Control variables	Yes	No
R-squared	10.8%	0.1%
N	4,411	6,990

TABLE VI: CONTRACT HORIZON AND PROFITABILITY

This table presents the coefficients from regressions when the dependent variable is ROA. In columns 1 and 5, the at-will indicator is instrumented with the regression reported in column 6 of Table III. Column 1 is a three-stage least-squares regression in which expected horizon is estimated with the regression shown in column 2 of Table IV. Column 2 shows regressions that include all firms with fixed-term contracts; column 3 shows regressions that include only firms with five-year contracts. Standard errors are heteroskedasticity robust and clustered by year in all specifications except the one reported in column 1. In column 2, lambda is the Heckman's lambda from a regression where the dependent variable is one minus the at-will indicator; in column 3, where the dependent variable is an indicator for five-year contracts. All variables (except for indicator variables and discrete variables) are winsorized at the 1% level. This table shows coefficients along with *t*-statistics in parentheses.

Dependent Variable		**ROA**				
		(1)	**(2)**	**(3)**	**(4)**	**(5)**
		Terminated	**Fixed-term**		**All contracts**	
		Expected horizon	**All fixed-term**	**5-year contracts**	**OLS**	**IV**
Horizon	Expected horizon	0.057**				
		(2.033)				
	Remaining years		0.000	0.006*		
			(0.14)	(1.945)		
	At-will				0.000	-0.093**
					(-0.038)	(-2.049)
	Tenure	0.002***	0.002***	-0.002	0.002***	0.002***
		(2.683)	(7.077)	(-1.375)	(6.689)	(6.338)
	Age	0.001	-0.001**	0.001	-0.001***	-0.001***
		(0.892)	(-2.339)	(1.053)	(-3.592)	(-3.614)
Control variables (firm/industry)	Size	0.087***	0.076***	0.069***	0.082***	0.080***
		(25.641)	(30.144)	(13.458)	(38.003)	(55.957)
	Tobin's Q	-0.002	-0.003**	-0.005	-0.002*	-0.002**
		(-1.099)	(-2.749)	(-1.73)	(-1.887)	(-2.494)
	Leverage	-0.124***	-0.149***	-0.189***	-0.156***	-0.150***
		(-8.562)	(-9.831)	(-4.92)	(-14.906)	(-23.531)
	Fraction institutional investors	-0.007	0.030***	0.047***	0.025***	0.025***
		(-0.391)	(6.107)	(3.847)	(6.33)	(3.312)
	Herfindahl index	-0.5	0.161	0.044	0.692**	0.195
		(-0.561)	(0.365)	(0.041)	(2.231)	(0.334)
Control variables (governance)	Governance index	-0.022***	-0.004***	-0.002	-0.007***	-0.006***
		(-5.52)	(-9.288)	(-0.832)	(-16.085)	(-3.809)
	Governance index available	-0.153***	0.038***	0.051*	0.024***	0.030**
		(-3.52)	(4.602)	(1.81)	(3.335)	(2.026)
	Chairman and CEO	-0.026***	0.009	0.022	0.003	0.001
		(-2.729)	(1.471)	(1.375)	(0.515)	(0.237)
Heckman	Lambda		-0.113***	0.403*		
			(-5.041)	(1.858)		
Constant			-1.018***	-2.976**	-0.273***	-0.307***
			(-4.921)	(-2.166)	(-9.647)	(-2.704)
Year fixed		Yes	Yes	Yes	Yes	Yes
Industry fixed		Yes	Yes	Yes	Yes	Yes
R^2			49%	50%	48%	
F		9.06				24.66
N		4,749	5,932	1,224	10,733	9,610

TABLE VII: ROBUSTNESS

This table presents the coefficients from regressions where the dependent variable is industry-adjusted CAPEX/sales. Column 1 reports a regression including all COMPUSTAT firms between 1992 and 2008, where all CEOs without a fixed-term contract are labeled at-will. Columns 2 and 3 report regressions that include only contracts of firms that offer at least one at-will and one fixed-term contract. Column 4 reports regressions in which the number of remaining years is measured as the difference between the current date and the first renewal date. Columns 5 and 6 report regressions that include CEO fixed effects. Column 7 reports a two-stage regression in which the at-will indicator is instrumented with the regression reported in column 6 of Table III. Columns 3, 4, 6, and 8 show regressions that include all firms with fixed-term contracts. Standard errors are heteroskedasticity robust and clustered by year. This table shows coefficients along with *t*-statistics in parentheses.

		Dependent variable: CAPEX/Sales (industry-adjusted)							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		All firms	Sample	Fixed	Fixed	Sample	Fixed	Sample	Fixed
		COMPU-STAT	Switchers	Switchers	Renewal dates	Executive fixed effects	Executive fixed effects	Compen-sation	Compen-sation
Horizon	Remaining Years			0.046***	0.025***		0.020*		0.020***
				(3.27)	(3.703)		(1.9)		(3.13)
	At-will	-0.160***	-0.129*			-0.173***		-0.735***	
		(-3.24)	(-1.84)			(-2.71)		(-3.23)	
	Tenure		-0.002	-0.006*	-0.001	-0.020***	-0.031***	-0.001	-0.004
			(-0.27)	(-1.8)	(-0.59)	(-2.66)	(-3.62)	(-0.59)	(-1.7)
	Age		0.005	0.008***	-0.002	-0.002	0.001	-0.002	-0.002*
			(0.92)	(3.56)	(-1.371)	(-0.44)	(0.18)	(-1.37)	(-2.04)
Compensation	Incentive to total pay							-0.034	-0.059*
								(-1.09)	(-2.07)
	Percent voting power							0.002	0.001
								(1.29)	(0.5)
	Log compensation							0.134***	0.168***
								(5.32)	(6.55)
	Percent unexercisable							-0.067	-0.022
								(-1.03)	(-0.36)
	ExecuComp data available							-0.831***	-1.055***
								(-4.86)	(-5.76)
	RiskMetrics data available							-0.064*	-0.052
								(-1.89)	(-1.25)
Control variables	*Q* (lag 1)	0.024***	0.009	0.026***	0.025***	0.019***	0.021**	0.025***	0.026***
(Investment)		(10.86)	(0.37)	(3.66)	(3.463)	(3.67)	(2.78)	(3.46)	(3.58)
	Q (lag 2)	0.008***	0.005	0.003	0.002	0.012**	0.009	0.002	0.002
		(3.29)	(0.21)	(0.5)	(0.275)	(2.37)	(1.14)	(0.28)	(0.33)
	Accrual	-0.000***	-0.001**	-0.001***	-0.001***	0.000	-0.001***	-0.001***	-0.001***
		(-3.65)	(-2.49)	(-4.61)	(-5.26)	(-0.09)	(-5.49)	(-5.26)	(-5.56)
	Profitability	-0.307***	0.334*	0.001	0.042	0.277***	-0.002	0.042	0.076
		(-10.69)	(2)	(0.01)	(0.356)	(3.31)	(-0.02)	(0.36)	(0.47)
	Size	-0.096***	-0.163***	-0.117***	-0.149***	-0.458***	-0.136***	-0.149***	-0.149***
		(-32.57)	(-3.99)	(-6.06)	(-6.932)	(-22.94)	(-6.66)	(-6.93)	(-7.17)
Control variables	Leverage	-0.192***	0.08	-0.083***	-0.050**	-0.047	-0.114***	-0.050**	-0.054**
(Finance)		(-12.06)	(0.88)	(-3.77)	(-2.125)	(-0.94)	(-3.13)	(-2.13)	(-2.48)
	Cash flow	0.381***	-0.058	-0.055	-0.084	0.305***	-0.194	-0.084	-0.086
		(7.77)	(-0.22)	(-0.31)	(-0.48)	(2.6)	(-1.03)	(-0.48)	(-0.79)
	Tangibility	0.460***	1.167***	0.475***	0.451***	0.267**	0.408***	0.451***	0.511***
		(10.36)	(7.85)	(8.41)	(8.151)	(2.07)	(4.96)	(8.15)	(10.85)
	Cash flow x tangibility	-0.289***	-0.178	0.173	0.182	-0.290**	0.274	0.182	-0.001*
		(-5.52)	(-0.48)	(0.75)	(0.783)	(-2.24)	(1.09)	(0.78)	(-2.06)
	KZ index	-0.004***	0.001	-0.002	-0.002	0.005***	-0.001	-0.002	-0.002
		(-4.4)	(0.33)	(-0.7)	(-0.608)	(2.8)	(-0.43)	(-0.61)	(-0.51)
Control variables	Idiosyncratic risk	-1.009***	-0.244	-2.854***	-2.412***	0.718	-1.799**	-2.412***	-2.590***
(risk)		(-3.39)	(-0.12)	(-4.36)	(-4.009)	(0.72)	(-2.67)	(-4.01)	(-4.16)
	Industry sales volatility	-0.315***	-0.981***	-0.420**	-0.461***	0.157	-0.331*	-0.461***	-0.429**
		(-3)	(-4.29)	(-2.73)	(-3.012)	(0.69)	(-2)	(-3.01)	(-2.65)
Control variables	Governance index		-0.024*	-0.003	-0.003	-0.014	0.000	-0.003	-0.003
(Governance)			(-1.97)	(-0.44)	(-0.561)	(-0.87)	(0.06)	(-0.56)	(-0.58)
	Governance dummy		-0.438***	-0.275***	-0.251***	-0.259*	-0.228**	-0.251***	-0.253***
			(-3.18)	(-4.29)	(-3.338)	(-1.85)	(-2.58)	(-3.34)	(-3.5)
	Chairman and CEO		0.082	0.023	0.014	-0.014	0.006	0.014	0.013
			(1.21)	(0.74)	(0.419)	(-0.2)	(0.19)	(0.42)	(0.43)
	Fraction individual investors	0.113**	0.280***	0.153***	0.119***	0.027	0.166***	0.119***	0.124***
		(2.01)	(3.11)	(4.61)	(4.41)	(0.4)	(5.05)	(4.41)	(4.58)
Heckman	Lambda			-0.141***	-0.141***		-0.549		-0.132***
				(-5.05)	(-5.051)		(-1.23)		(-4.74)
Constant		-0.180***	-2.029***	-1.189***	-0.598***	1.621***	0.054	0.04	-0.419***
		(-2.61)	(-4.97)	(-4.91)	(-5.674)	(4.66)	(0.07)	(0.23)	(-3.18)
Year fixed		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\mathbf{R^2}$		7%	5%	9%	8%	63%	61%		9%
F								17.06	
N		55,908	1,451	739	6,472	7,731	4,460	7,731	4,460

TABLE VIII: PROPENSITY SCORE RESULTS

This table presents the covariate means for the at-will and fixed-term samples, where the at-will sample includes all firms of the COMPUSTAT population between 1992 and 2008 without contract data. *Panel A* is un-matched (the original sample). *Panels B* and *C* include all firm-years under fixed-term contracts and the 10 at-will firm-years with the closest propensity scores. Propensity scores are computed as fitted values of regressions with CAPEX/sales (*Panel B*) or R&D/sales (*Panel C*) as the dependent variable. Independent variables are the firm and industry related control variables listed in Tables V as well as industry indicator variables.

	Panel A. Un-matched sample				**Panel B. Sample matched with CAPEX controls**			
	At-will	**Fixed-term**	**Difference**	**t-stat**	**At-will**	**Fixed-term**	**Difference**	**t-stat**
Capex/sales	13%	7%	7%	9.61 ***	13%	18%	-5%	-3.63 ***
Assets	1,134	2,545	(1,411)	-22.75 ***	1,134	1,004	130	0.34
Market-to-book	2.23	2.54	(0.31)	-4.08 ***	2.23	1.90	0.33	1.2
N	53,803	1,436			14,360	1,436		
					Panel C. Sample matched with R&D controls			
R&D/sales	36%	9%	28%	9.47 ***	36%	67%	-31%	-6.39 ***
Assets					1,037	851	186	0.49
Market-to-book					2.52	2.84	(0.32)	-1.04
N	27,987	761			7,610	761		

APPENDIX: STATE INDICES

This table presents the at-will exceptions, anti-takeover regulations, the Garmaise (2009) index, and the number of patents issued between 1977 and 2004 by state.

		At-will exceptions					
Code	**State**	**Public policy**	**Implied contract**	**Good faith and fair dealing**	**Garmaise**	**Anti-takeover**	**Patents**
AL	Alabama	0	1	1	5	0	9,017
AK	Alaska	1	1	1	3	0	1,075
AZ	Arizona	1	1	1	3	1	27,065
AR	Arkansas	1	1	0	5	0	3,867
CA	California	1	1	1	0	0	303,592
CO	Colorado	1	1	0	2	0	31,339
CT	Connecticut	1	1	0	3	1	45,008
DC	District of Columbia	1	1	0	6	0	1,576
DE	Delaware	1	0	1	7	1	10,827
FL	Florida	0	0	0	9	0	55,303
GA	Georgia	0	0	0	5	1	23,774
HI	Hawaii	1	1	0	3	0	1,946
ID	Idaho	1	1	1	6	1	14,903
IL	Illinois	1	1	0	5	1	92,974
IN	Indiana	1	0	0	5	1	33,766
IA	Iowa	1	1	0	6	0	13,330
KS	Kansas	1	1	0	6	1	9,086
KY	Kentucky	0	1	0	6	1	9,738
LA	Louisiana	0	0	0	4	0	11,803
ME	Maine	0	1	0	4	1	3,099
MD	Maryland	1	1	0	5	1	29,470
MA	Massachusetts	1	0	1	6	1	69,616
MI	Michigan	1	1	0	5	1	82,589
MN	Minnesota	1	1	0	5	1	48,550
MS	Mississippi	1	1	0	4	0	3,597
MO	Missouri	1	0	0	7	1	20,864
MT	Montana	1	0	1	2	0	2,623
NE	Nebraska	0	1	0	4	1	4,697
NV	Nevada	1	1	1	5	0	5,591
NH	New Hampshire	1	1	0	2	0	10,766
NJ	New Jersey	1	1	0	4	1	95,136
NM	New Mexico	1	1	0	2	0	6,345
NY	New York	0	1	0	3	1	139,544
NC	North Carolina	1	0	0	4	0	31,587
ND	North Dakota	1	1	0	0	0	1,603
OH	Ohio	1	1	0	5	1	83,265
OK	Oklahoma	1	1	0	1	0	16,955
OR	Oregon	1	1	0	6	0	23,386
PA	Pennsylvania	1	0	0	6	1	84,618
RI	Rhode Island	0	0	0	3	1	6,413
SC	South Carolina	1	1	0	5	1	12,229
SD	South Dakota	1	1	0	5	1	1,385
TN	Tennessee	1	1	0	7	1	17,301
TX	Texas	0	0	0	3	0	106,463
UT	Utah	1	1	1	6	0	12,413
VT	Vermont	1	1	0	5	0	5,613
VA	Virginia	1	0	0	3	1	23,797
WA	Washington	1	1	0	5	1	32,901
WV	West Virginia	1	1	0	2	0	4,321
WI	Wisconsin	1	1	0	3	1	36,818
WY	Wyoming	1	1	1	4	1	1,282

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