Explicit vs. Implicit Contracts: Evidence from CEO Employment Agreements[*]

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Abstract

We report evidence on the determinants of whether the relationship between a firm and its Chief Executive Officer (CEO) is governed by an explicit (written) or an implicit agreement. We find that fewer than half of the CEOs of S&P 500 firms have comprehensive explicit employment agreements. Consistent with contracting theory, explicit agreements are more likely to be observed, and are likely to have a longer duration, where the sustainability of the relationship is less certain and where the expected loss to the CEO is greater if the firm fails to honor the agreement.

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When a firm hires a Chief Executive Officer (CEO), it enters into a complex relationship that has significant long-term implications for its stockholders. Establishing the terms of this relationship requires determining the CEO's responsibilities, compensation, perquisites, term of employment, the conditions under which either party can sever the relationship, and restrictions on the CEO's outside activities, among other considerations. Despite the complexity of these arrangements, many public companies, including some of the largest, choose not to put their terms in writing. As of the year 2000, less than half of the firms in the S&P 500 had a comprehensive written (or, explicit) employment agreement (EA) with their CEOs. The other firms either had no written agreements at all, or had agreements that covered only limited aspects of their relationship with the CEO, such as change of control, non-disclosure, non-compete, or non-solicitation agreements. These latter firms and their CEOs relied on implicit EAs through which the CEO was employed *at will*.

We report evidence on the determinants of whether the relationship between a firm and its CEO is contractually defined in an explicit agreement. This evidence provides insights concerning the choice between using an explicit EA and using an implicit EA in contracting with the CEO and, more generally, concerning the factors that drive the decision to codify the terms of a relationship in writing.

The focus of this paper is inextricably linked to fundamental issues in corporate finance. The firm itself can be viewed as a nexus of implicit and explicit contracts in which the EA with the CEO is arguably among the most important.[1] A well-designed EA internalizes the costs and benefits of the CEO's investment, operating, and financing decisions, thereby providing the CEO

[1] See Zingales (2000) for a discussion of the implications of the theory of the firm as a nexus of explicit and implicit contracts.

with incentives to act in stockholders' interests.

While we know a great deal about outcomes related to CEO EAs, little is known about the agreements themselves. Many studies focus on observable outcomes such as CEO turnover (for instance, Coughlan and Schmidt, 1985), or CEO compensation (such as Jensen and Murphy, 1990; Bebchuk, Fried, and Walker, 2002; Murphy, 2002) and benefits (Bebchuk and Jackson, 2005; Rajan and Wulf, 2006; and Yermack, 2006). Evidence from these studies helps us better understand the relationships between firms and their CEOs but, as MacLeod and Malcomson (1998) and Nosal (2001) note, the contracting outcomes themselves are likely to be affected by whether the contracts are explicit or implicit. Despite the importance of understanding the nature of the contracts themselves, with notable exceptions, such as Kole's (1997) study of equity compensation plans, recent studies by Rusticus (2007) and Sletten and Lys (2006), on severance agreements, and a recent study by Garmaise (2007), on non-compete agreements, there is relatively little evidence in the finance literature on CEO EAs.[2]

The conditions under which explicit contracts are more or less likely to exist than implicit contracts have been discussed in the literature (for example, see Telser, 1980; Bull, 1987; Hart and Holmström, 1987; Klein, 1996; and Baker, Gibbons and Murphy, 2002). Such discussions often focus on situations where a supplier is required to make specific investments in order to fulfill a contractual obligation to a producer. In this environment, the contracting parties rely on implicit contracts only when there is a sufficiently low probability of the producer reneging on the agreement after the supplier has made the required investment, or when there is a sufficiently low probability of the supplier holding up the producer in some way, such as in the Fisher Body-General Motors example described by Klein, Crawford, and Alchian (1978).

[2] Brickley (1999) and Kaplan and Strömberg (2003) report related evidence in their studies of franchise and venture capital contracts, respectively, and Agrawal and Knoeber (1998) examine employment contracts and golden parachutes in their study of compensation and the threat of takeovers.

Incentives to adhere to an implicit contract include the potential for sharing future profits that arise from the relationship. In contrast, penalties from violating such agreements can include the loss of future profits from the agreement or damage to one party's reputation that can impede the ability to contract with others in the future. Despite the well-developed theoretical implications, there is little empirical evidence on the circumstances under which explicit or implicit contracts are more likely to be observed. CEO EAs are a natural source of evidence on these theories because CEOs supply labor to firms, and the potential exists for both parties to make significant investments that are specific to one another.

We find that explicit EAs are used more frequently at firms operating in more uncertain business environments and at firms that are likely to face lower costs from reneging on an agreement with the CEO. The former evidence is consistent with the idea that firms facing greater uncertainty are more likely to encounter situations in which the benefits from reneging on an EA outweigh the costs. For example, the optimal set of skills required of the CEO might change in a way that makes it advantageous to replace the incumbent CEO. An explicit EA provides financial protection to the incumbent CEO in such a situation.

CEOs that have been hired from another firm (outside CEOs) are also more likely to have explicit EAs. These CEOs tend to face greater uncertainty in their relationships with their firms than CEOs who have been promoted from within. Outside CEOs often have fewer relationships with board members and other senior executives and are less familiar with the firm in general.

The evidence is also consistent with the argument that CEOs who have more to lose in the event that the firm reneges are more likely to have an explicit EA. We find strong evidence that CEOs who can expect to earn greater abnormal compensation at their firms, both in the near future and over the estimated remainder of their career, are more likely to have an explicit EA.

In addition, CEOs who receive a larger fraction of their pay as incentive-based compensation, which tends to be at greater risk if the firm reneges, are more likely to have an explicit EA.

Our analysis concludes with an examination of the determinants of the duration of an explicit EA. We find that the factors that explain the presence of an explicit EA also explain contract duration. For example, the duration of an explicit EA with a CEO hired from outside a firm is roughly one year longer, on average, than the duration of an explicit EA with a CEO who was promoted internally. The evidence from the analysis of contract duration indicates that CEOs who face greater threat of opportunistic behavior by a firm, or who have more to lose in the event of such behavior, are not only more likely to have an explicit EA, but are also more likely to have agreements that explicitly protect them for longer periods of time.

The paper is organized as follows. Section I discusses factors that influence the choice between implicit and explicit contracts. Section II describes the sample used in the empirical analysis and the characteristics of explicit EAs in our sample. Section III presents the evidence and Section IV concludes with a discussion of the implications of the evidence.

I. Implicit vs. Explicit Contracts

When a new CEO is appointed, the CEO and the board of directors must determine whether the relationship between the CEO and the firm will be governed by an explicit or an implicit agreement. This section discusses theory relating to this choice and its implications.

A. Uncertainty and Employment Agreement Choice

Economic theory suggests that a contract is more likely to be implicit when the benefits from voluntarily adhering to it exceed the costs for both of the contracting parties. Telser (1980) emphasizes the role of future profits (benefits minus costs) in sustaining

implicit contracts. He argues that any implicit contract must involve a sequence of transactions in which there is always a positive probability of continuing the relationship. The profits that the contracting parties anticipate from future transactions provide them with incentives to abide by the terms of the agreement. If the timing of the last transaction is known with certainty, Telser suggests that both of the contracting parties will have an incentive to violate the terms of the agreement because there are no profits to lose by foregoing subsequent transactions. Bull (1987) and Klein (1996), among others, note that, in addition to the loss of profits from future business with the counterparty, reputation concerns can provide incentives to abide by a contract even if the date of the last transaction is known with certainty.

The choice between using an explicit and an implicit contract can be reasonably straightforward when the gains to both parties are known at the time the contract is entered into. However, uncertainty makes this choice less clear. We can distinguish between two types of uncertainty. The first is uncertainty on the part of the contracting parties about the nature of the costs and benefits to the other party. To the extent that one party is uncertain about the potential for opportunistic behavior by the other, then entering into an explicit agreement can reduce the overall cost of the contract.

The second type of uncertainty concerns how the costs and benefits of the relationship to the individual contracting parties might change over time. Changes in the costs and benefits can make an implicit agreement unattractive to a contracting party who previously found it advantageous to abide by such an agreement. The possibility that the costs and benefits can change in the future makes the choice between implicit and explicit contracts less clear. On the one hand, explicit contracts can provide greater protection

against the possibility that one party reneges on the agreement at the expense of the other party. On the other hand, an explicit agreement makes it more costly to alter the agreement or, as Klein (1996) points out, to terminate the relationship altogether if conditions change. Bull (1987) adds that implicit contracts can also allow parties to contract in ways that would be unenforceable in court. This suggests that implicit contracts will be preferred where flexibility is important and where there is uncertainty about the legal interpretation of the terms of an explicit agreement.

These general arguments have specific implications for the choice of the form of the contract between a CEO and a firm. Both the CEO and the board can have incentives to abide by an implicit EA in order to avoid 1) losing profits derived from the relationship or 2) damaging their respective reputations in the labor market. Of course, uncertainty about the profits that the other party expects to receive from the relationship or uncertainty about the importance of reputation to the other party can affect EA choice. For example, the board of a firm that is performing poorly might face lower costs of reneging because the future profits that can be lost by terminating a relationship with the CEO are smaller. A board that has recently fired a CEO might also face lower costs from behaving opportunistically because such behavior can have a smaller affect on its reputation than similar behavior by a board that has not recently broken an EA. When the CEO is uncertain about the costs to the board along these dimensions, he or she might prefer an explicit EA. The board, on the other hand, might prefer the flexibility afforded by an implicit EA.

The board of a poorly performing firm can also have incentives to behave myopically, for example, if the firm is likely to be acquired, forced into bankruptcy, or face other circumstances that increase the likelihood of board turnover. Knoeber (1986) argues that the board is more

likely to renege on an agreement with the CEO when there is board turnover because the reputation effects are smaller for directors who did not enter into the original agreement with the CEO. Where the board's incentives to adhere to an implicit EA for these reasons are weaker, a CEO is less likely to prefer such an agreement.

In addition to uncertainty introduced by a firm's current situation, the level of uncertainty about its future operating environment also affects the viability of using an implicit EA. For example, as uncertainty about the firm's operating environment increases, there is also likely to be an increase in the probability that the board faces a situation in which other executives are better suited for the CEO position than the incumbent. In such a situation the board can have an incentive to replace the CEO because the costs of adhering to the EA outweigh the benefits. Even in a situation where the incumbent CEO is still viewed as the best person for the job, the board can have an incentive to alter the conditions of employment by, for example, changing the incentive structure of the CEO's compensation.

An increase in the level of uncertainty about a firm's future operating environment can also increase uncertainty about the future reputation concerns of the board. To the extent that changing business conditions lead to financial distress, damage to the board's reputation from reneging on an EA and, therefore, the board's incentive to abide by an implicit EA can be reduced.

The incumbent CEO faces potential losses in the above examples if he or she is not protected by an explicit EA. However, in a more uncertain environment, the relative attractiveness of a particular position to a CEO might also be more likely to change. In fact, the CEO might find it beneficial to renege on an EA because a change in the environment has made management positions elsewhere more attractive. Precisely how the level of

uncertainty surrounding a firm's future operating environment affects the choice between an explicit and an implicit EA is therefore unclear.

A CEO who is appointed from outside the firm is likely to be more uncertain about the benefits and costs to the firm of opportunistic behavior and about the dynamics within the firm that might lead a board to renege on an EA, compared to a CEO who is promoted from within. The insider is likely to have better information with which to assess the likelihood that the board will honor an implicit agreement. Consequently, a CEO who is appointed from outside the firm is more likely to prefer an explicit agreement.

The depth of the managerial labor market also affects the cost of reneging and therefore the likelihood that a board will find it advantageous to replace the CEO. If many other managers possess the skills that are most important to a particular CEO position, it is likely to be less expensive a firm to replace the CEO (Parrino, 1997). All else equal, this suggests that a CEO who is in a position that requires more general skills will tend to prefer an explicit EA because his or her position is less certain.[3]

B. Potential Loss and Employment Agreement Choice

The preceding discussion focuses on how contract form choice is affected by the possibility that one of the contracting parties will find it advantageous to renege, and uncertainty surrounding that condition. The expected loss to one party, conditional on the other party reneging, is also likely to affect this choice. Where the damage to one party from opportunistic behavior is greater, an explicit contract is more likely to be preferred by that party for a given

[3] Baker, Gibbons, and Murphy (2002) examine an additional factor in the viability of an implicit contract, asset ownership. They show that the ability to sustain an implicit (or relational, in their language) contract is affected by the decision to integrate, due to the changes in recourse and bargaining power that occur when a firm, rather than a supplier, owns an asset. Note that in the context of employment agreements, the relevant asset ownership is held fixed outside the firm due to the inalienability of human capital. Thus, we test for other influences on the choice of implicit or explicit contracts, while holding the primary issue of Baker, Gibbons, and Murphy constant.

level of uncertainty.

Klein, Crawford, and Alchian (1978) and Williamson (1979) discuss the contracting implications of a situation in which a significant up-front investment by one party provides incentives for post-contractual opportunistic behavior by the other. In the Fisher Body-General Motors example that Klein, Crawford, and Alchain discuss, an explicit contract is designed to alleviate the concerns of the supplier (Fisher Body) but ends up being very costly for the producer (General Motors).

A CEO who invests heavily in firm- or industry-specific human capital faces higher potential costs from opportunistic behavior by the firm than a CEO who does not make such investments, particularly if alternative employers are unwilling to compensate the CEO for that capital. This can provide the board of directors with an incentive to take advantage of the CEO, by paying less than promised (Hart and Holmström, 1987) or by otherwise altering the EA. Conversely, the firm might face post-contractual opportunistic behavior by the CEO if the firm has invested in developing the CEO's abilities and the cost of replacing the CEO is high. Where the firm or the CEO is concerned about the possibility of such behavior, they might be more likely to prefer an explicit EA.

The expected loss to a CEO when a board reneges on an EA is also likely to be related to the level and form of the CEO's compensation. A CEO who receives above-market compensation has more to lose if a board behaves opportunistically because he or she is less likely to find another position that pays similarly. Further, a younger CEO would expect to incur these lost wages for a longer period of time. Therefore, a CEO who receives abnormally high compensation is likely to prefer an explicit contract and this preference is likely to be especially strong for a young CEO. We would also expect that CEOs who receive more of their

compensation in the form of incentive pay (rather than salary) will prefer explicit contracts. Incentive compensation is inherently more susceptible to opportunistic behavior on the part of the firm than salary, especially to the extent that it is not vested.

Of course, a firm can also suffer losses if a CEO reneges on an EA. For example, many firms invest heavily in the professional development of their senior managers. These investments help the managers develop skills that benefit stockholders by making the mangers more effective. The unexpected loss of a CEO can be costly to the firm because of the direct expense of hiring a replacement and because of the costs associated with any disruption that might be experienced while the new CEO acquires the skills necessary to run the firm.

C. The Practitioners' Perspective

While the terminology is somewhat different, the focus on the choice between implicit and explicit contracts among practitioners emphasizes many of the same issues as the economics literature. From the firm's perspective, practitioners note that explicit agreements are advantageous in the resolution of uncertainty as they 1) help attract and retain good employees by providing evidence of a commitment, 2) clarify the responsibilities and duties of the position, and 3) limit legal exposure by clearly specifying the nature of relationship (e.g., if it is "at will") and how disputes will be resolved (for example, see Hale et al., 2000). The commonly discussed disadvantages include the possibility that provisions in the agreement might be misinterpreted in the courts and the fact that such agreements limit the flexibility of the board (Hale et al., 2000).

The vast majority of firms are publicly silent on the reasons they have an implicit or an explicit agreement with the CEO. They either say nothing or, where they have an implicit agreement, simply state in their annual proxy statement that they have no explicit agreement. However, firms do occasionally say more. For example, General Electric Company states in its

2006 annual proxy statement that:

> "GE does not, in general, enter into employment agreements with our senior executive officers. They serve at the will of the Board. This enables the company to remove a senior executive officer prior to retirement whenever it is in the best interests of the company, with full discretion on any severance package (excluding vested benefits). Similarly, GE does not enter into severance agreements with senior executive officers when they are hired or promoted. On the rare occasion when a senior executive officer is removed, the committee exercises its business judgment in approving an appropriate separation arrangement in light of all relevant circumstances, including the individual's term of employment, past accomplishments and reasons for separation from the company."

From the CEO's perspective, the key advantage of an explicit agreement appears to be that it codifies the nature of the agreement. This reduces the risk of entering into this relationship by specifying conditions under which the EA can be terminated, and the rights of the CEO (e.g., to additional compensation) upon such termination.

II. Sample and Characteristics of Explicit Employment Agreements

A. Sample Construction

Our sample consists of the 494 U.S.-based firms in the S&P 500 on January 1, 2000 and their CEOs as of that date. We construct the sample by combining a set of explicit CEO EAs provided to us by The Corporate Library with agreements identified by searching the SEC filings of all remaining S&P 500 firms for any mention of an explicit EA. We consider only written agreements that cover, in broad terms, the relationship between a firm and its CEO to be an explicit EA. Agreements that are only applicable upon a change in control or separation of service, or compensation plans that cover only one aspect of pay, are not included. Securities and Exchange Commission (SEC) Regulation S-K requires that firms disclose material EAs with their named officers and directors, and we assume that all such agreements are disclosed. Our final dataset consists of 184 explicit EAs in place on January 1, 2000, 41 observations where

firms disclose that there is an agreement but we cannot find it, and 269 firms that have no written EA. We create an indicator variable, *contract*, to identify the 225 total explicit EA observations.

B. Characteristics of Explicit CEO Employment Agreements

Cross-sectional variation in the length of CEO EAs, as measured in pages, suggests that their complexity varies substantially (see Schwab and Thomas (2004) for a detailed discussion of the provisions in CEO EAs). For example, the agreements in our sample range from relatively straightforward, one- or two-page letter agreements, to detailed 60-page documents. Although the specifics vary, a typical agreement begins by specifying the CEO's responsibilities and additional titles, such as President or Chairman of the Board, and also covers the areas of compensation, termination and resignation, and governing law and dispute resolution.

CEO explicit EAs typically cover a fixed period of time and can allow for renewals under specified conditions. The duration of the explicit part of an EA is one measure of the degree of protection it provides. EAs with longer explicit durations provide more structure, legal protection over a longer horizon, and greater guaranteed compensation for the CEO. An explicit EA with a short duration protects the CEO over a limited horizon and leaves more of the future subject to implicit contracting. Nevertheless, an explicit EA with a short duration still provides more formal structure than an implicit EA. Thus, the duration of an explicit EA can be viewed as a measure of the degree to which the expected future contracting relationship is explicit. We identify the duration of each EA in years – which we label *explicit contract duration*, – and set this variable equal to zero for CEOs without explicit contracts (because the entire agreement is

left implicit).[4] For explicit contracts that do not specify duration at all (9 contracts), or that have an explicit statement that the CEO will be employed at will or indefinitely (14 contracts), we set *explicit contract duration* equal to one day (1/365 year).

The compensation section of the EA specifies details on the CEO's salary, bonus (sometimes specifying target and maximum bonus amounts), option grants, stock grants, and any signing bonus (which in turn, can be composed of cash, options, and/or stock). The CEO's salary is typically specified only for the first year of the agreement or as a minimum over the life of the EA. Future compensation is generally left to the discretion of the board. Many EAs also detail benefit plans and perquisites, including retirement benefits from supplemental employee retirement plans (SERPs) and allowances for cars, plane usage, and the like.[5]

Provisions protecting the CEO against early dismissal and changes in control are common. Such clauses specify the conditions under which a CEO can be dismissed by the firm for "good cause," such as following a felony conviction, or conditions under which the CEO can leave the firm for "good reason," such as in response to a change in duties or place of employment. These provisions also specify any payments the firm must make to the CEO when he or she leaves the firm, which are typically larger when the CEO is dismissed for a reason other than good cause, or if the CEO leaves for good reason. For example, Yermack (2005) finds that the average severance payment due to the settlement of an employment agreement is

[4] Implicit EAs can be viewed as long-term contracts to the extent that they have no specific expiration date other than, perhaps, that represented by a mandatory retirement age. However, as we discuss later, because we are interested in the length of the period over which the EA reduces uncertainty to the CEO, our analysis focuses on the duration of the explicit part of the contract. In our main analysis we only include the duration of the EA prior to any renewal period. As we also discuss below, our results on EA duration are robust to several alternative ways of treating renewable contracts.

[5] Perquisites can be specified in great detail. For example, Robert Annunziata's contract with Global Crossing specifies that, "the Company shall purchase, on behalf of Executive, a brand-new 1999 model Mercedes-Benz SL 500," and, "monthly first class airfare to Los Angeles for members of Executive's immediate family (spouse, mother and all children including the child of his wife, Patricia)."

approximately $0.15 million around voluntary CEO turnover. In contrast, the average is over $3 million for CEOs who are forced out of office.

It is worth noting that we do not observe contract features compensating the firm for the loss of the manager's services if he or she terminates the contract early without good reason. However, CEOs who terminate a contract early typically forgo unvested stock and option grants and might be exposed to claw-back provisions covering signing bonuses and other up-front payments.

Some provisions in explicit EAs provide protection for the firm. These include restrictions on the CEO's outside activities, such as limits on outside board memberships, which help ensure that the CEO will focus on managing the business. Other provisions prohibit disclosure of confidential information, or preclude the CEO from entering into competition with the firm (non-compete provisions) or soliciting employees or customers following the CEO's departure (non-solicitation provisions). These provisions provide legal remedies to the firm if a CEO reveals sensitive information about the firm or behaves opportunistically after employment.

The final provisions that we commonly observe in explicit agreements specify the governing legal jurisdiction and require that both parties enter into arbitration in the event of a dispute. These provisions help reduce uncertainty over the legal interpretation of the contract and reduce enforcement costs in the event of a dispute.

Table I presents summary statistics for the common employment agreement provisions in our sample. As the table indicates, the most prevalent among these is a provision defining the terms under which the firm can remove the CEO for good cause, present in 169 out of 184 agreements (91.8 percent). Initial salary is the next most common provision (84.2 percent), and where present, the mean specified starting salary is almost $900 thousand. The least common

provision that we tabulate is a loan to the CEO, found in only 18 agreements (9.8 percent).

III. Empirical Analysis

A. Explanatory Variables

In modeling the determinants of both the presence and duration of explicit CEO contracts we use explanatory variables that reflect the environment faced by each sample firm at a particular point in time. Thus, our study is cross-sectional, but in event time, where the primary event we focus on is the date the CEO and firm entered into an agreement (implicit or explicit). While the agreements all cover the person who is CEO as of the beginning of 2000, they were entered into on various dates from 1961 to 2002. For firms with an explicit agreement, we identify the event date as the most recent of either 1) the date the agreement was initially signed or 2) the date of the most recent amendment, because the date of a written amendment is clearly a point in time when both parties revisited their decision to have an explicit contract. For firms with no explicit agreement, we use the date of the CEO's original appointment, or the date of the first available proxy statement that contains the necessary data about the CEO and firm. In addition to the normal reasons data might be missing in widely used electronic databases, data are not always available about the CEO at the time of his or her appointment because the firm is not yet public (for example, a number of the CEOs are founders) or because the CEO was appointed prior to 1978 when proxy-based data became widely available. Using the dates identified in this way (termed the *event date* for both implicit and explicit contracts), we merge the event dates with explanatory and control variables. We collect buy-and-hold returns for periods ending the month before the event date, and financial and proxy-based data from the fiscal year that ended immediately prior to the event date.

Examination of the explicit EAs in our sample reveals that the protections for CEOs are stronger and more pervasive than protections for firms. While there are provisions that provide protection for firms—principally those related to non-disclosure, non-compete, non-solicitation, and dispute resolution—the first three of these provisions are also commonly found in narrow stand-alone explicit agreements. Garmaise (2007) reports that 70.2 percent of the firms in a sample of 351 firms have non-compete agreements. Change of control and non-disclosure agreements appear to occur at least as frequently in our sample, although it is difficult to determine precisely how frequently because firms do not always report the existence of narrow stand-alone agreements. The difference between 70.2 percent frequency reported by Garmaise and the 45.6 percent (225/494) incidence of explicit EAs in our sample indicate the prevalence of the stand-alone agreements.

To the extent that non-disclosure, non-compete, and non-solicitation agreements are often observed as stand-alone contracts, this suggests that comprehensive EAs are more commonly observed where managers are concerned about the firm reducing their compensation or perquisites below promised amounts, or terminating the relationship early. For this reason we focus on factors that predict opportunistic behavior on the part of the firm, rather than the CEO.

A.1. Measures of Uncertainty

We construct explanatory variables to capture the degree of uncertainty surrounding the contracting environment. One source of uncertainty stems from the firm's operating environment, which we measure using two proxies. The first, *median volatility of sales*, is the median standard deviation of percentage changes in sales, across all firms in the sample firm's

industry, during the seven-year period centered on the event date.[6] The second, *industry survival rate*, is calculated as one minus the percentage of firms in the industry that were de-listed during that year due to mergers and acquisitions, as identified in the Center for Research in Security Prices (CRSP) database. We expect the degree of uncertainty to be increasing in the first proxy and decreasing in the second.

Two firms that face a similar degree of uncertainty in their respective operating environments can still have different incentives to behave opportunistically because they face different costs of reneging. We use four explanatory variables as proxies for these costs.

The first three of these variables are selected based on the expectation that firms with recent histories of poor performance or that have recently fired a CEO will have weaker reputations in the labor market and therefore lower expected costs of reneging. To measure performance, we calculate *market-adjusted return* as the difference between the six-month buy-and-hold return on the firm's stock, ending the month prior to the event date, and the return on the CRSP value-weighted index over the same period. We also calculate *industry-adjusted EBIT/assets* as the firm's earnings before interest and taxes (EBIT) during the fiscal year ending immediately before the event date, scaled by total book assets, less the industry median value of this ratio in the event year. These measures of abnormal performance are set to zero for CEOs for whom sufficient CRSP or Compustat data are not available prior to the event date.

Our third proxy for the costs of reneging is an indicator variable, *prior CEO fired*, that takes the value of one if a CEO at the sample firm was forced from office within five years of the event date, using the forced turnover classification scheme described by Parrino (1997).[7] We

[6] Throughout the analysis, we define a firm's industry using the 2-digit Standard Industrial Classification (SIC) industry.

[7] We also used an indicator variable identifying firms listed in Fortune magazine's "Best Companies to Work For" as a proxy for reputation but this variable was insignificant in our tests and had no effect on our other results.

expect a firm that has recently fired a CEO to bear smaller reputation costs if the board reneges on an EA. However, it is also possible, independent of our expectation, that an incoming CEO might view a CEO firing (and the departed CEO's lack of success) as an indicator of the difficulty in succeeding at that firm. Both of these arguments suggest that *prior CEO fired* will be associated with a greater likelihood of observing an explicit EA.

Our fourth proxy for the firm's cost of reneging is based on the depth of the managerial labor pool. Firms that compete in homogeneous industries are likely to face lower costs of reneging on an implicit contract because they are able to draw from deeper CEO talent pools (Parrino, 1997). To measure this, we calculate *industry homogeneity* as the median, across all firms in an industry, of the percentage variation in monthly stock returns that is explained by an equally-weighted industry index over the 1980 to 2001 period.

Our final proxy for the degree of uncertainty in the contracting relationship is an indicator for CEOs that joined the firm less than one year before being appointed as CEO, which we label *outside CEO*. Outside CEOs know less about firm (including board) dynamics than otherwise similar internal candidates and are likely to be less certain about the environment within the firm, its true prospects, and the decision making process the board will follow.[8]

A.2. Measures of Potential Loss from Opportunistic Behavior

The second factor we expect to be associated with the incidence of explicit contracts is the expected loss to the CEO if the firm reneges on the EA. Two CEOs who work for firms with similar operating environment uncertainty and similar firm-specific costs of reneging (e.g.,

[8] While we interpret the *outside CEO* variable as a proxy for uncertainty, to the extent that outside CEOs make greater firm-specific investments in human capital, they may also have more to lose in the event that the firm acts opportunistically. This greater expected loss would also predict greater incidence and duration of explicit agreements.

comparable recent performance and reputations in the labor market) can face different costs if their EAs are broken by the firm.

One reason is that the compensation of the two CEOs can differ, and this difference can affect the losses that the CEOs would suffer from opportunistic behavior. As a proxy for the potential loss of compensation, we estimate a measure of the abnormal compensation that each CEO receives. To do this, we first estimate the CEO's expected total cash compensation using a regression model that relates the natural log of total cash compensation to the natural log of the firm's total assets, the ratio of EBIT to assets, the ratio of assets to firm value, CEO tenure, and indicators for the firm's industry and the year of the observation. We estimate this model for all CEOs in the Execucomp or *Forbes* surveys (for years before Execucomp) for whom the appropriate data are available. The difference between a CEO's actual cash compensation and his or her expected cash compensation —the residual from the model—is a measure of the excess compensation that the CEO receives in each year. We average these differences over the life of the contract for CEOs with written EAs, and over the three years beginning on the event date for CEOs without written EAs and designate this average as *abnormal compensation*. As a measure of incentive pay, we calculate the ratio of the value of stock and option grants to total pay over the same period and label this *incentive to total compensation.*

Another source of variation in the expected loss to a CEO from opportunistic behavior by the firm is the CEO's employment horizon. A CEO with a short horizon (e.g., one who is close to retirement) will be less concerned about opportunistic behavior by the firm because the potential cost to the CEO from opportunistic behavior, such as a reduction in the value of the CEO's human capital, is likely smaller. As a proxy, we use the CEO's age as of the date he or she was appointed and designate this variable *CEO age*. This horizon effect is likely to interact

with the expected loss in compensation over the CEO's remaining career, so we also construct *abnormal compensation at risk* as the product of abnormal compensation and the maximum of 65 minus CEO age or zero.

A.3. Control variables

We also include control variables for CEO ownership, firm leverage and firm size. *CEO ownership* is the percentage of the firm's common stock that is beneficially owned by the CEO as of the event date. *Leverage* is the ratio of interest-bearing debt (both long and short term) to the market value of equity. *Natural log of assets* is the natural log of the firm's book assets at the end of the fiscal year ending immediately before the event date, in year 2000 dollars.

B. Sample Statistics and Univariate Evidence

Table II presents descriptive statistics for EA, CEO, firm, and industry characteristics for our sample. Mean and median values are presented for each variable, for the full sample, and for the sub-samples of firms with and without explicit agreements. Univariate statistics are reported for tests of differences in both the mean and the median values across the two sub-samples.

Panel A of Table II reports statistics for the prevalence of explicit CEO contracts in the S&P 500 and measures of the duration and scope of those agreements. Approximately 46 percent (225/494) of the CEOs in the S&P 500 had an explicit agreement at the beginning of the year 2000. In contrast, Agrawal and Knoeber (1998) report that in 1987 only 12 percent of the CEOs in a sample of 446 Forbes 800 firms had employment agreements. Among our sample agreements, the median duration and contract length are three years and 13 pages, respectively.

Panels B, C, and D present statistics on CEO characteristics, firm- and industry-based measures of uncertainty, and other firm characteristics as of the event date. Univariate tests in Panel B indicate that the median CEO with an explicit EA owns less of the company's stock,

earns more cash compensation, receives a higher fraction of stock-based compensation, has more abnormal compensation at risk, and is more likely to have been appointed from outside the firm. From Panel C, one can see that firms with explicit EAs tend to have weaker stock-market performance, and compete in industries with greater sales volatility and lower survival rates. Panel D also shows that the typical firm with an explicit EA is moderately smaller, as measured by total assets.

We also examined the correlations between the variables in Table II. We do not report these correlations in a table in the interest of conserving space, but it is worth nothing that most of the variables that are significantly related to the presence of an explicit EA are also significantly related to *explicit contract duration*, with the correlations having the same sign. This is consistent with the view that shorter explicit contracts are more similar to implicit contracts than longer ones.

We begin our analysis by examining the incidence of explicit contracts across classifications based on key explanatory variables. Table III presents statistics on differences in the incidence of explicit EAs and their duration for subsamples partitioned using our proxies for the degree of uncertainty and the amount of abnormal compensation at risk. Each panel presents statistics for a different uncertainty measure. The statistics reported in each panel include the percentage of firms within each subsample that have an explicit EA, the average duration of those explicit EAs (immediately below the percentage values), and p-values for tests that these values differ both across the columns and rows. The two statistics reported in parentheses in the lower right corner of each panel are p-values for tests of null hypothesis that explicit EA incidence and duration are equal across all four subsamples.

The evidence in this table indicates that explicit EAs occur significantly more frequently

at firms where the CEO has a high level of abnormal compensation at risk. An examination of the reported incidence of explicit EAs across samples partitioned on this variable reveals large differences that are, in all but one case, statistically significant. The evidence from the differences in the duration measure is generally similar. These findings are consistent with the argument that CEOs who have more to lose in the event that the firm behaves opportunistically are more likely to have an explicit agreement as protection against this loss.

Inspection of the evidence for the various proxies for the degree of uncertainty reveals that firms operating in industries with low survival rates, that have low market-adjusted returns, and in which the CEO was hired from outside the firm are more likely to have an explicit agreement, independent of the amount of abnormal compensation at risk. This is apparent from comparisons of the statistics on explicit EA incidence across the rows in the various panels. Specifically, Panels B, C, and G show statistically significant differences in incidence. The corresponding evidence for differences in explicit contract duration is less informative.

C. Multivariate Evidence

In this section, we present multivariate tests of our hypotheses. We begin with results from probit regression models predicting the presence of an explicit agreement. We then present evidence from Tobit regression models explaining explicit contract duration.

C.1. Explicit vs. Implicit Contracts

Table IV presents the results from regressions explaining the use of an explicit contract. Instead of coefficient estimates, the table presents partial derivatives with respect to each continuous independent variable, holding all other variables at their mean values and indicator variables at zero.

Models 1 and 2 in Table IV focus on the ability of our proxies for uncertainty to predict the use of an explicit EA. From Model 1, it can be seen that a CEO appointed from outside the firm is 38.3 percent more likely to have an explicit EA than an otherwise identical (average) CEO who is appointed from within.[9] This difference is highly significant. Model 2 shows that this result is unaffected when we include our other proxies for the degree of uncertainty. The coefficient estimates for these other proxies reveal that the likelihood of an explicit EA is significantly positively related to the median volatility of sales and negatively related to the survival rate in a firm's industry. This indicates that explicit EAs are more prevalent where there is greater uncertainty and implies that the benefit of the additional protection afforded the CEO by such an agreement outweighs the cost associated with the loss of flexibility that an implicit EA provides the firm. The significantly negative coefficient estimate on the market-adjusted return variable is consistent with the prediction that poorly performing firms are more likely to renege on an implicit agreement because it is less costly for them to do so.[10] Consequently, CEOs of poorly performing firms are more likely to have an explicit EA. Finally, the positive coefficient estimate on the industry homogeneity indicator is consistent with the prediction that CEOs in homogeneous industries are more likely to have an explicit EA due to the lower costs of replacing a CEO where there are a larger number of executives with similar skills.

The significant negative coefficient estimate on industry survival rate differs from the evidence reported by Agrawal and Knoeber (1998), who find no relation between the threat of takeover and the use of explicit EAs. However, the market for corporate control in their 1987 sample period was very different from the one that existed in 2000, and the incidence of explicit

[9] We obtain similar results when we define an outside CEO as a CEO who joins the firm on the event date, rather than within one year of the event date.

[10] We obtain similar results if we measure returns over longer windows. As we lengthen the window, the significance of *market-adjusted return* gradually weakens.

agreements in 1987 was much lower than in 2000.[11]

Models 3 and 4 add measures of the potential loss to the CEO to the specification in Model 1. Model 3 suggests that CEOs who receive greater abnormal compensation and more incentive compensation are more likely to have explicit EAs. Model 4 includes the abnormal pay at risk variable, which combines the abnormal compensation and CEO age variables to obtain a summary measure of the total compensation that the CEO stands to lose if the firm behaves opportunistically. The positive coefficient estimate that is highly significant reinforces the finding from Model 3 that CEOs who have more to lose are more likely to be employed under explicit agreements.

Models 5 and 6 add measures of the potential loss to the CEO to the specification in Model 2. The coefficient estimates from these models reveal that the results in Models 1 through 4 are robust. Models 5 and 6 have Pseudo R-squared values of 0.15 and are highly significant.

The results in Table IV show that many of the factors are economically and statistically significant. Among the continuous variables that are economically significant, the smallest predicted effect (in absolute value) on the probability of an explicit EA for a one standard deviation increase is 6.1 percent (for incentive to total pay), while the largest is 9.4 percent (for market-adjusted return), compared to the unconditional probability of 45.6 percent. The other three significant continuous variables have predicted effects within this range. One standard deviation increases in median volatility of sales, industry survival rate, and abnormal compensation at risk are associated with an increase of 6.6 percent, a decrease of 8.3 percent, and an increase of 7.4 percent in the probability of an explicit agreement, respectively. The

[11] Agrawal and Knoeber (1998) test for relations between the presence of an explicit contract and CEO ownership, firm size, the number of years the CEO was with the company prior to being appointed to that position, the level of the industry-wide takeover threat, and whether the firm was subsequently acquired. Among these variables, only the relation with the number of years the CEO had been with the company was statistically significant. Consistent with the evidence we report for outside CEO hires, this variable was negatively related to the presence of an explicit contract.

coefficient estimates for the indicator variables also indicate large economic effects. CEOs in homogeneous industries and those hired from outside the firm are 14.9 percent and 36.2 percent more likely, respectively, to have an explicit EA.

C.2. Explicit Contract Duration

Given the evidence on the incidence of explicit EAs, we now examine the duration of these agreements. The length of time that EAs explicitly protect the CEO can vary widely. An implicit agreement provides no explicit protection whatsoever while an explicit agreement can provide such protection for a period ranging from a matter of days to several years. In this sense, even explicit agreements can differ considerably in the protection they provide. We next examine the determinants of this variation in explicit contact duration for further evidence on the theory discussed in Section I.

Table V presents estimates for Tobit models of the relations between explicit contract duration and our explanatory variables. The Tobit specifications account for the fact that explicit contract duration is bounded below at zero. The table is structured like Table IV, with each model having the same explanatory variables as the corresponding model in Table IV.

One issue that we must address when modeling explicit contract duration is the appropriate treatment for contract renewal provisions. These provisions, where present, typically specify that the agreement will renew for some additional period of time if neither party notifies the other in writing of their intent not to renew the agreement. One specific type of renewal provision, an evergreen provision, allows for the automatic renewal of a contract on a regular (for example, daily) basis, so that the remaining contract life is substantially fixed at its original duration until the parties agree to terminate it. Explicit contract duration for the 22 contracts that contain evergreen provisions is set equal to the specified duration, but we include an *evergreen*

indicator variable for these contracts in the contract duration regressions as a control. More general contract renewal provisions typically only allow for a single renewal when the original contract expires. We do not include an indicator variable to control for the presence of these provisions because renewal lengths can vary considerably. Instead, we check the robustness of the results in Table V to alternative specifications in which the dependent variable is the sum of renewal length and explicit contract duration and in which renewal length is included an additional explanatory variable. All reported results are robust to these alternative specifications.

Instead of coefficient estimates, in Table V we present marginal effects conditional on the presence of an explicit contract. Specifically, we report the expected infinitesimal change in contract duration for an infinitesimal change in the explanatory variable of interest, conditional on the presence of an explicit agreement, while holding the other variables at their means. In this way, these estimated effects are not just capturing the presence of an explicit contract, but are instead measuring changes in duration for CEOs with explicit agreements. The advantage of this approach is that it allows the information contained in the observations without explicit agreements to enter the estimation.

The evidence in Table V is very similar to the probit results in Table IV. In fact, for all models, all of the significant coefficient estimates for uncertainty proxies in Table IV are also significant, with the same sign, in Table V. Not only do measures of uncertainty in the firm's environment, prior stock-market performance, industry homogeneity, and the origin of the CEO predict the existence of an explicit agreement, they also predict the length of such agreements.

The reported marginal effects of the coefficients suggest that the estimated impact of these variables is economically significant conditional on a CEO having an explicit agreement. For example, across the various models in Table V, the coefficient estimates for outside CEO

suggest that CEOs who are hired from outside the firm have explicit agreements that are about one year longer in duration than CEOs with explicit EAs who were promoted from within the firm. Similarly, explicit EAs have an average duration that is almost six months longer in homogeneous industries. Both of these effects are large relative to the median explicit duration of three years.

In Models 3 through 6 of Table V, all of our measures of pay at risk are statistically significant. In addition to abnormal compensation and abnormal compensation at risk, the ratio of incentive to total pay is also a significant predictor of explicit contract duration. This result indicates that abnormal compensation and pay based on incentives not only predict the existence of an explicit agreement, but also predict the duration of an explicit EA where one exists. For example, using the standard deviation of this variable of 0.25 from Table II, a one standard deviation increase in the ratio of incentive to total pay predicts an approximate three-month increase in explicit contract duration for CEOs with explicit EAs.

Overall, the evidence in Tables IV and V is consistent with the predictions of the theory. Both measures of uncertainty and measures of potential loss to the CEO predict the existence and duration of explicit employment agreements.

IV. Conclusion

The nature of the employment relationship between firms and their CEOs has long been the focus of scrutiny by academics, practitioners, and regulators alike. This study contributes to our understanding of this relationship, and the contracting process more generally, by providing evidence from a unique database of employment contracts for CEOs of S&P 500 firms at the beginning of 2000. We find that less than half of the S&P 500 CEOs are employed under explicit agreements – agreements that specify terms of the employment relationship – rather than

implicit arrangements.

The evidence supports theoretical arguments regarding when we might expect to observe explicit rather than implicit contracts. Specifically, explicit agreements are more likely to exist where uncertainty over the potential for post-contractual opportunistic behavior on the part of a firm is greater, and where the CEO has more to lose in the event that the firm reneges on the agreement. In particular, we find that explicit agreements are more likely at firms that operate in less certain environments and that face lower costs of reneging on an implicit agreement. We also find that explicit arrangements are more likely for CEOs appointed from outside the firm, for whom the level of uncertainty entering into the position is even greater. In terms of the expected loss to the CEO in the event the firm reneges, the likelihood of an explicit EA is greater for CEOs with higher abnormal compensation and who receive more incentive compensation.

We also examine the length of time that the CEO contract is covered by an explicit contract. These results are generally consistent with factors that also explain where explicit contracts are more or less likely to be used. We find that explicit EAs have longer durations, indicating a lesser reliance on implicit contracting, when the uncertainty over future opportunistic behavior by firms is greater, when CEOs come from outside the firm, or if they have more abnormal or incentive compensation at risk.

On balance, the evidence supports the theoretical literature on the choice between explicit and implicit agreements. The significant variation in the use and duration of explicit agreements suggest that a more detailed examination of the variation in employment agreement features will provide a rich area for future research. Appreciation of these fundamental differences in the nature of CEO contracts may also help in interpreting the observed outcomes of various corporate governance mechanisms, including CEO compensation and turnover.

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Table I
Compensation and Perquisite Summary Statistics

Summary statistics for compensation characteristics and the frequency of specific perquisities in 184 comprehensive explicit employment agreements (EAs) between firms in the S&P 500 and their CEOs as of the beginning of the year 2000. For compensation characteristics, the number of contracts containing each item, the proportion of the 184 EAs that this represents, and the mean among the EAs that include such provisions are presented. Initial restricted stock and option grants are valued using the share price as of the contract date. For option grants that are specified as the number of options granted rather than a dollar amount, the per-share value is calculated as one-third of the stock price. For perquisites and other provisions, the number of contracts containing each item and the proportion of the 184 explicit contracts that these numbers represent are presented. The other provisions are provisions that pertain to the CEO resigning for "good reason" or being dismissed for "cause," what happens in the event of a change of control, protecting the confidentiality of sensitive information, and the ability of the CEO to compete with the firm subsequent to departing.

	Number of Contracts Containing Provision	Percentage of Contracts Containing Provision	Mean, Conditional on Being in Contract
Compensation characteristics:			
Initial salary	155	84.2%	$894,324
Target bonus (% of salary)	92	50.0%	101.9%
Cash signing bonus	26	14.1%	$4,056,785
Initial restricted stock grant	57	31.0%	$351,944
Initial option grant	83	45.1%	$11,900,000
Perquisites:			
Supplemental retirement plan	103	56.0%	
Car use	70	38.0%	
Club membership	49	26.6%	
Plane use	31	16.8%	
Loans to CEO	18	9.8%	
Other Provisions:			
CEO dismissal for good cause	169	91.8%	
CEO resignation for good reason	139	75.5%	
Change of control provision	144	78.3%	
Confidentiality	149	81.0%	
Non-compete	117	63.6%	

Table II
Descriptive Statistics

CEO employment agreement (EA), CEO, firm, and industry characteristics for firms in the S&P 500. The data used are for the date of the most recent amendment to the EA for CEOs who have an explicit agreement and for the date of the first available proxy statement following the initial appointment of CEOs who do not. We call this the event date. *Contract* is an indicator variable that equals one if the CEO who is in office at the beginning of 2000 has an explicit EA. *CEO age* is the age of the CEO when he or she was appointed to that position. *CEO ownership* is the percentage of the firm's common stock beneficially owned by the CEO as of the event date. *Outside CEO* is an indicator variable that equals one if the CEO was appointed to that position within one year of joining the firm. *Prior CEO fired* is an indicator variable that equals one if a previous CEO is fired in the five years prior to the event date. A firing is defined using the criteria outlined in Parrino (1997). *Salary* is the average salary of the CEO in thousands of year 2000 dollars. All compensation values are averaged over the life of the contract for CEOs with an explicit EA and over the three years following the event date for those without. *Incentive to total compensation* is the ratio of incentive-based pay (the value of stock and option grants) to total pay. *Abnormal compensation at risk* is the product of a measure of abnormal compensation and the maximum of 65 minus CEO age or zero. Abnormal compensation is estimated as the residual from a regression model that relates the natural log of cash compensation to firm characteristics. This regression model was estimated using data for all firms for which the required information are available in Execucomp or in the Forbes compensation surveys. *Market-adjusted return* is the return on the firm's stock, adjusted using the CRSP value-weighted index, over the six months preceding the event date. *Industry-adjusted EBIT/assets* is ratio of EBIT/assets in the fiscal year preceding the event date, less the median value of that ratio for the primary two-digit SIC industry in which the firm competes. *Median volatility of sales* is the median, across all firms in the sample firm's two-digit SIC industry, of the standard deviation of the percentage change in year-to-year sales over the seven year period surrounding the event date. *Industry survival rate* equals one minus the fraction of firms in the industry that were delisted due to mergers and acquisitions in the year that includes the event date. The *industry homogeneity* value is the median, across all firms in the sample firm's two-digit SIC industry, of the percentage variation in monthly stock returns that is explained by an equally-weighted industry index over the 1980 to 2001 period. *Leverage* is the ratio of interest-bearing debt (both long and short term) to market value of equity. *Assets* is the book assets, in year 2000 dollars, at the end of the fiscal year ending immediately before the event date. Two-tailed p-values for tests of differences in mean and median values are reported in parentheses below the t-value and Wilcoxon Z statistics.

	Total Sample			Firms With Explicit Employment Agreements			Firms With Implicit Employment Agreements			Statistics for Tests of Differences Between Mean and Median Values for Firms With Explicit and Implicit Agreements	
Variable	N	Mean	Median	N	Mean	Median	N	Mean	Median	t-value	Wilcoxon Z
Panel A: Employment agreement characteristics											
Contract	494	0.4555 (0.4985)	0.0000	225	1.0000 (0.0000)	1.0000	269	0.0000 (0.0000)	0.0000		
Explicit conract duration (years)	453	1.3837 (2.0968)	0.0000	184	3.4066 (1.9825)	3.0000	269	0.0000 (0.0000)	0.0000		
Contract length (pages)	453	5.7373 (8.8996)	0.0000	184	14.1250 (8.7466)	13.0000	269	0.0000 (0.0000)	0.0000		
Panel B: CEO characteristics											
CEO age	494	48.0951 (7.5736)	49.0000	225	48.2133 (7.3259)	49.0000	269	47.9963 (7.7870)	50.0000	-0.3169 (0.7514)	0.069 (0.9452)
CEO ownership (%)	491	3.0182 (8.9182)	0.3113	222	2.4874 (9.0041)	0.2190	269	3.4562 (8.8395)	0.4300	1.1986 (0.2313)	4.363 (0.0003)
Outside CEO	494	0.2409 (0.4281)	0.0000	225	0.3867 (0.4881)	0.0000	269	0.1190 (0.3243)	0.0000	-7.2782 (0.0000)	-6.922 (0.0000)
Prior CEO fired	494	0.1599 (0.3669)	0.0000	225	0.1822 (0.3869)	0.0000	269	0.1413 (0.3489)	0.0000	-1.2363 (0.2169)	-1.236 (0.2166)
Salary ($ thousands)	422	794.91 (363.34)	752.43	206	858.88 (406.95)	788.79	216	733.90 (304.86)	735.00	-3.5813 (0.0004)	-3.3850 (0.0007)
Incentive to total compensation	491	0.5776 (0.2476)	0.6088	223	0.6205 (0.2323)	0.6508	268	0.5419 (0.2546)	0.5745	-3.5415 (0.0004)	-3.6690 (0.0002)
Abnormal compensation at risk ($ thousands)	469	2,508.16 (4,355.28)	1098.26	215	3,714.08 (4,884.64)	2950.96	254	1,487.40 (3,553.05)	141.13	-5.6994 (0.0000)	-5.0790 (0.0000)

Table II continued
Descriptive Statistics

Variable	Total Sample			Firms With Explicit Employment Agreements			Firms With Implicit Employment Agreements			Statistics for Tests of Differences Between Mean and Median Values for Firms With Explicit and Implicit Agreements	
	N	Mean	Median	N	Mean	Median	N	Mean	Median	t-value	Wilcoxon Z
Panel C: Firm and industry-based measures of uncertainty											
Market-adjusted return	494	0.1235 (1.0030)	0.0000	225	-0.0015 (0.5319)	-0.0204	269	0.2280 (1.2609)	0.0000	2.5471 (0.0112)	2.779 (0.0054)
Industry-adjusted EBIT/assets	476	6.08% (12.44%)	3.15%	216	6.04% (11.54%)	3.49%	260	6.12% (13.17%)	2.83%	0.0674 (0.9463)	-1.053 (0.2924)
Median volatility of sales	484	21.9% (0.0947)	19.7%	221	22.9% (0.1034)	20.2%	263	21.1% (0.0860)	19.6%	-2.1129 (0.0351)	-1.555 (0.1200)
Industry survival rate	494	94.2% (0.0357)	94.7%	225	93.4% (0.0341)	93.3%	269	94.8% (0.0359)	95.5%	4.2307 (0.0000)	4.862 (0.0000)
Industry homogeneity value	494	16.4% (0.0519)	13.7%	225	16.3% (0.0469)	13.7%	269	16.5% (0.0558)	13.7%	0.4674 (0.6404)	-0.723 (0.4696)
Panel D: Other firm caracteristics											
Leverage	478	0.6799 (2.4491)	0.2223	221	0.5548 (0.8834)	0.2472	257	0.7874 (3.2373)	0.2047	1.0352 (0.3011)	-1.283 (0.1995)
Total assets ($ millions)	484	$23,714 ($71,042)	$5,045	221	$23,276 ($68,223)	$6,674	263	$24,082 ($73,454)	$4,435	0.1242 (0.9012)	-2.5550 (0.0106)

Table III
Contract Incidence and Duration for Explicit CEO Employment Agreements

Incidence and duration of comprehensive explicit employment agreements (EAs) for CEOs of S&P 500 firms as of the beginning of the year 2000. Each panel presents the the proportion of firms that have an explicit EA and the average duration (in years) of the explicit agreements for sample partitions based on a measure of the abnormal compensation the CEOs' have at risk and for seven uncertainty proxies. All partitions, except those for *prior CEO fired* and *outside CEO*, split the sample at the median value for each variable. The data used are for the date of the most recent amendment to the EA for CEOs who have an explicit agreement and for the date of the first available proxy statement following the initial appointment of CEOs who do not. We call this the event date. P-values are reported for differences in the values across the columns and rows within each panel, as well as for tests of the hypothesis that all four values are equal (in parentheses). P-values for differences in proportions are for chi-squared tests and p-values for tests of differences in duration are for F-tests. The uncertainty proxies are defined as follows: *Median volatility of sales* is the median, across all firms in the sample firm's two-digit SIC industry, of the standard deviation of the percentage change in year-to-year sales over the seven year period surrounding the event date. *Industry survival rate* equals one minus the fraction of firms in the industry that were delisted due to mergers and acquisitions in the year that includes the event date. *Market-adjusted return* is the return on the firm's stock, adjusted using the CRSP value-weighted index, over the six months preceding the event date. *Industry-adjusted EBIT/assets* is ratio of EBIT/assets in the fiscal year preceding the event date, less the median value of that ratio for the primary two-digit SIC industry in which the firm competes. *Prior CEO fired* is an indicator variable that equals one if a previous CEO is fired in the five years prior to the event date. A firing is defined using the criteria outlined in Parrino (1997). *Industry homogeneity* is the median, across all firms in the sample firm's two-digit SIC industry, of the percentage variation in monthly stock returns that is explained by an equally-weighted industry index over the 1980 to 2001 period. *Abnormal compensation at risk* is the product of a measure of abnormal compensation and the maximum of 65 minus CEO age or zero. Abnormal compensation is estimated as the residual from a regression model that relates the natural log of cash compensation to firm characteristics. This regression model was estimated for each sample firm using data for all firms in the two-digit SIC industry in which the sample firm has its primary operations and for which the required information are available in Execucomp and in the Forbes compensation surveys.

		Abnormal Compensation at Risk		P-Values for Tests that Columns Differ
		Low	High	
Panel A:				
Median volatility of sales	High	36.3%	59.7%	0.000
		2.95	3.69	0.088
	Low	31.7%	55.6%	0.000
		3.10	3.83	0.077
P-values for tests that rows differ	% Contract	0.457	0.526	(0.000)
	Duration	0.671	0.553	(0.056)
Panel B:				
Industry survival rate	High	23.7%	46.9%	0.000
		2.41	4.11	0.002
	Low	44.8%	67.2%	0.001
		3.28	3.54	0.447
P-values for tests that rows differ	% Contract	0.001	0.002	(0.000)
	Duration	0.190	0.077	(0.008)
Panel C:				
Market-adjusted return	High	29.8%	50.8%	0.001
		2.86	3.18	0.499
	Low	38.9%	64.6%	0.009
		3.14	4.18	0.033
P-values for tests that rows differ	% Contract	0.139	0.032	(0.000)
	Duration	0.735	0.005	(0.003)
Panel D:				
Industry-adjusted EBIT/assets	High	36.9%	58.8%	0.000
		3.20	3.59	0.271
	Low	27.6%	54.3%	0.001
		2.49	4.23	0.002
P-values for tests that rows differ	% Contract	0.155	0.529	(0.000)
	Duration	0.315	0.072	(0.011)

		Abnormal Compensation at Risk		P-Values for Tests that Columns Differ
		Low	High	
Panel E:				
Prior CEO fired	Voluntary	31.7%	59.0%	0.000
		3.36	3.77	0.185
	Forced	51.7%	51.1%	0.955
		1.93	3.64	0.024
P-values for tests that rows differ	% Contract	0.038	0.324	(0.000)
	Duration	0.038	0.835	(0.007)
Panel F:				
Industry homogeneity value	High	35.7%	62.8%	0.001
		3.21	3.99	0.070
	Low	33.5%	54.4%	0.000
		2.92	3.59	0.114
P-values for tests that rows differ	% Contract	0.100	0.207	(0.000)
	Duration	0.806	0.188	(0.031)
Panel G:				
Outside CEO	Outsider	64.9%	76.9%	0.179
		2.92	3.73	0.128
	Insider	28.4%	47.8%	0.000
		3.08	3.77	0.061
P-values for tests that rows differ	% Contract	0.000	0.000	(0.000)
	Duration	0.878	0.951	(0.065)

Table IV
Probit Models Predicting Use of Explicit CEO Employment Agreement

Probit models predicting whether firms in the S&P 500 have comprehensive explicit employment agreements (EAs) with their CEOs. The data used are for the date of the most recent amendment to the EA for CEOs who have an explicit agreement and for the date of the first available proxy statement following the initial appointment of CEOs who do not. We call this the event date. The dependent variable, *contract* , equals one if the firm has an explicit EA and zero otherwse. The partial derivative with respect to the independent variable and the t-statistic for the model coefficient (in parentheses) are reported. The partial derivative is computed holding other variables at their mean values, except for indicator variables that are set to zero. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. *Median volatility of sales* is the median, across all firms in the sample firm's two-digit SIC industry, of the standard deviation of the percentage change in year-to-year sales over the seven year period surrounding the event date. *Industry survival rate* equals one minus the fraction of firms in the two-digit SIC industry that were delisted due to mergers and acquisitions in the year that includes the event date. *Market-adjusted return* is the return on the firm's stock, adjusted using the CRSP value-weighted index, over the six months preceding the event date. *Industry-adjusted EBIT/assets* is ratio of EBIT/assets in the fiscal year preceding the event date, less the median value of that ratio for the primary two-digit SIC industry in which the firm competes. *Prior CEO fired* is an indicator variable that equals one if a previous CEO is fired in the five years prior to the event date. A firing is defined using the criteria outlined in Parrino (1997). The *industry homogeneity* indicator is an indicator variable that equals one if the homogeneity measure for a firm's industry is above the median for all industries. Industry homogeneity is measured as the median, across all firms in a two-digit SIC industry, of the percentage variation in monthly stock returns that is explained by an equally-weighted industry index over the 1980 to 2001 period. *Outside CEO* is an indicator variable that equals one if the CEO was appointed to that position within one year of joining the firm. *Abnormal compensation* is estimated as the residual from a regression model that relates the natural log of cash compensation to firm characteristics. This regression model was estimated using data for all firms for which the required information are available in Execucomp or in the Forbes compensation surveys. *Incentive to total compensation* is the ratio of incentive-based pay (the value of stock and option grants) to total pay. Compensation is averaged over the life of the contract for firms with an explicit EA and for the three year period following the event date for CEOs without an EA. *CEO age* is the age of the CEO on the date that he or she was appointed to that position. *Abnormal compensation at risk* is the product of *abnormal compensation* and the maximum of 65 minus *CEO age* or zero. *CEO ownership* is the percentage of the firm's common stock beneficially owned by the CEO as of the event date. *Leverage* is the ratio of interest-bearing debt (both long and short term) to market value of equity. *Natural log of assets* is the natural log of book assets at the end of the fiscal year ending immediately before the event date.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-0.489*** (-3.61)	1.442* (1.91)	-0.545*** (2.70)	-0.605*** (-4.15)	1.599** (2.00)	1.556* (1.97)
Measures of uncertainty:						
Median volatility of sales		0.774** (2.58)			0.668** (2.13)	0.695** (2.22)
Industry survival rate		-2.083*** (-2.87)			-2.269*** (-2.97)	-2.323*** (-3.04)
Market-adjusted return		-0.104*** (-2.79)			-0.098*** (-2.66)	-0.094*** (-2.61)
Industry-adjusted EBIT/assets		-0.055 (-0.26)			-0.024 (-0.11)	-0.018 (-0.08)
Prior CEO fired		-0.020 (-0.28)			-0.006 (-0.08)	-0.010 (-0.14)
Industry homogeneity indicator		0.138** (2.47)			0.153*** (2.66)	0.149*** (2.61)
Outside CEO	0.383*** (6.60)	0.388*** (6.19)	0.352*** (5.83)	0.354*** (5.87)	0.362*** (5.58)	0.362*** (5.59)
Measures of potential loss:						
Abnormal compensation			0.127*** (3.16)		0.107** (2.55)	
Incentive to total compensation			0.246** (2.28)	0.244** (2.26)	0.253** (2.22)	0.247** (2.16)
CEO age			-0.002 (-0.49)		-0.003 (-0.67)	
Abnormal compensation at risk				0.006*** (2.97)		0.006** (2.47)
Control variables:						
CEO ownership (%)	0.001 (0.35)	0.001 (0.24)	0.003 (1.05)	0.004 (1.19)	0.003 (0.90)	0.003 (1.08)
Leverage	-0.023 (-1.27)	-0.028 (-1.47)	-0.019 (-1.13)	-0.017 (-1.06)	-0.023 (-1.32)	-0.022 (-1.23)
Natural log of assets	0.043*** (2.79)	0.023 (1.38)	0.042** (2.50)	0.039** (2.40)	0.023 (1.27)	0.019 (1.10)
Total observations	476	468	459	459	457	457
Observations with explicit employment agreement	219	214	211	211	209	209
Log likelihood	-301	-280	-282	-283	-266	-267
Pseudo R-squared	0.08	0.13	0.11	0.11	0.15	0.15

Table V
Tobit Models Predicting Explicit Agreement Duration in Years

Tobit models predicting the explicit duration of comprehensive explicit employment agreements (EAs) between firms in the S&P 500 and their CEOs. The data used are for the date of the most recent amendment to the EA for CEOs who have an explicit agreement and for the date of the first available proxy statement following the initial appointment of CEOs who do not. We call this the event date. The dependent variable is the duration of the explicit EA in years. The partial derivative with respect to the independent variable and the t-statistic for the model coefficient (in parentheses) are reported. The partial derivative is computed holding other variables at their mean values (except for indicator variables that are set to zero) and are conditional on the existence of an explicit EA. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. *Median volatility of sales* is the median, across all firms in the sample firm's two-digit SIC industry, of the standard deviation of the percentage change in year-to-year sales over the seven year period surrounding the event date. *Industry survival rate* equals one minus the fraction of firms in the two-digit SIC industry that were delisted due to mergers and acquisitions in the year that includes the event date. *Market-adjusted return* is the return on the firm's stock, adjusted using the CRSP value-weighted index, over the six months preceding the event date. *Industry-adjusted EBIT/assets* is ratio of EBIT/assets in the fiscal year preceding the event date, less the median value of that ratio for the primary two-digit SIC industry in which the firm competes. *Prior CEO fired* is an indicator variable that equals one if a previous CEO is fired in the five years prior to the event date. A firing is defined using the criteria outlined in Parrino (1997). The *industry homogeneity* indicator is an indicator variable that equals one if the homogeneity measure for a firm's industry is above the median for all industries. Industry homogeneity is measured as the median, across all firms in a two-digit SIC industry, of the percentage variation in monthly stock returns that is explained by an equally-weighted industry index over the 1980 to 2001 period. *Outside CEO* is an indicator variable that equals one if the CEO was appointed to that position within one year of joining the firm. *Abnormal compensation* is estimated as the residual from a regression model that relates the natural log of cash compensation to firm characteristics. This regression model was estimated using data for all firms for which the required information are available in Execucomp or in the Forbes compensation surveys. *Incentive to total compensation* is the ratio of incentive-based pay (the value of stock and option grants) to total pay. Compensation is averaged over the life of the contract for firms with an explicit EA and for the three year period following the event date for CEOs without an EA. *CEO age* is the age of the CEO on the date that he or she was appointed to that position. *Abnormal compensation at risk* is the product of *abnormal compensation* and the maximum of 65 minus CEO age or zero. *CEO ownership* is the percentage of the firm's common stock beneficially owned by the CEO as of the event date. *Leverage* is the ratio of interest-bearing debt (both long and short term) to market value of equity. *Natural log of assets* is the natural log of book assets at the end of the fiscal year ending immediately before the event date. *Evergreen* is an indicator variable that takes the value of one if a contract automatically renews so that the contract duration is fixed.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	--6.779*** (-4.81)	5.971 (0.93)	-7.823*** (-4.05)	-7.797*** (-5.29)	6.222 (0.94)	6.006 (0.92)
Measures of uncertainty:						
Median volatility of sales		2.707*** (3.46)			1.987** (2.54)	2.088*** (2.65)
Industry survival rate		-4.502** (-2.29)			-4.619** (-2.32)	-4.738** (-2.36)
Market-adjusted return		-0.329*** (-2.88)			-0.316*** (-2.79)	-0.314*** (-2.79)
Industry-adjusted EBIT/assets		-0.269 (-0.38)			-0.125 (-0.18)	-0.119 (-0.17)
Prior CEO fired		-0.168 (-0.91)			-0.137 (-0.76)	-0.149 (-0.82)
Industry homogeneity indicator		0.491*** (3.21)			0.485*** (3.19)	0.479*** (3.15)
Outside CEO	1.010*** (6.57)	0.998*** (6.45)	0.844*** (5.54)	0.864*** (5.63)	0.858*** (5.57)	0.873*** (5.64)
Measures of potential loss:						
Abnormal compensation			0.390*** (3.59)		0.308*** (2.90)	
Incentive to total compensation			1.057*** (3.30)	1.004*** (3.23)	1.023*** (3.19)	1.003*** (3.11)
CEO age			-0.000 (-0.01)		-0.004 (-0.45)	
Abnormal compensation at risk				0.019*** (3.16)		0.015** (2.57)
Control variables:						
CEO ownership (%)	0.001 (0.07)	-0.004 (-0.40)	0.011 (1.14)	0.009 (1.03)	0.006 (0.61)	0.005 (0.57)
Leverage	-0.081 (-1.39)	-0.099* (-1.72)	-0.054 (-1.14)	-0.050 (-1.08)	-0.069 (-1.37)	-0.064 (-1.30)
Natural log of assets	0.188*** (3.87)	0.136*** (2.69)	0.157*** (3.23)	0.156*** (3.24)	0.111** (2.19)	0.106** (2.10)
Evergreen	1.077*** (3.85)	0.866*** (3.17)	1.009*** (3.62)	1.039*** (3.71)	0.825*** (3.08)	0.849*** (3.153)
Total observations	439	431	425	425	423	423
Observations with explicit EA	219	214	211	211	209	209
Observations with explicit EA and well defined duration	180	175	175	175	173	173
Observations with at will EA	23	23	23	23	23	23
Log likelihood	-638	-605	-609	-610	-588	-589
Pseudo R-squared	0.06	0.09	0.08	0.08	0.10	0.10