THE UNIVERSITY OF TEXAS AT SAN ANTONIO, COLLEGE OF BUSINESS

Working Paper SERIES

WP # 0008FIN-452-2012

Date March 20, 2012

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Golden Parachutes, Incentives, and the Cost of Debt[♣]

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March 1, 2012

Abstract

We examine the relation between the presence of golden parachutes and the cost of debt financing. We hypothesize that since golden parachutes compensate CEOs in the event of termination, CEOs with golden parachutes will have an incentive to increase firm risk and decrease effort, and this will lead to a higher cost of debt. Consistent with these hypotheses, we document a significant positive relation between the use of golden parachutes and the cost of debt. We confirm these results with a natural experiment using a difference-in-difference specification based on a 2004 change in IRS tax regulations. Moreover, we find that the adoption of a golden parachute is associated with an increase in firm risk, a higher likelihood of CEO turnover, and a lower operating performance. Overall, the evidence suggests that golden parachutes are primarily negative for the firm and for debt holders in particular.

Key Words: Golden parachutes, cost of debt, takeover probability, firm risk, CEO turnover

JEL Classifications: G32, G34, G38, K22

[♣] Mansi and Nguyen are from Virginia Tech and Wald is from the University of Texas at San Antonio. The authors would like to thank Natasha Burns, Ambrus Kecskes, Ugur Lel, Tatyana Sokolyk, and seminar participants at Virginia Tech and University of South Florida for comments and suggestions. The remaining errors are the sole responsibility of the authors.

I. Introduction

Senior executive compensation packages adopted by boards of directors often contain large payouts, or severance agreements, called golden parachutes that provide cash and non-cash compensation if certain events such as demotion, termination, or forced resignation occur (see, e.g., Bebchuk, Cohen, and Wang, 2010).[1] Golden parachutes have become increasingly popular in the last two decades with the RiskMetrics data set documenting an increase in adoptions from roughly 50% in 1990 to 82% in 2010. Until recently, the adoption of golden parachutes did not require shareholder approval, although under the Dodd-Frank Act of 2010, firms are now required to receive approval from their shareholders when adding a golden parachute to the executive's compensation contract. In this paper, we examine the effect of golden parachutes on CEO incentives with respect to risk and effort, and show how the presence of golden parachutes in compensation contracts affects the firm's cost of debt capital. We hypothesize that since golden parachutes provide a large payment in the event of termination, CEOs have an incentive to increase firm risk and decrease effort. We posit that this increase in risk and decrease in effort leads to an increase in the firm's cost of debt.

In contrast to our focus on CEO incentives and the cost of debt, the existing literature on golden parachutes mostly considers their effects on takeovers and stock prices. For instance, Machlin, Choe, and Miles (1993), and Lambert and Larcker (1995) show that golden parachutes imply a greater takeover probability, while Hartzell, Ofek, and Yermack (2004) show that greater payouts to the CEO are associated with lower acquisition premia. An early event study by Lambert and Larcker (1985) finds a positive shareholder response to the adoption of golden parachutes; but more recent research by Brusa, Lee, and Shook (2009) finds that golden parachute adoption is a negative event, and more negative for more generous golden parachutes. Recently, Bechuck, Cohen, and Wang (2010) document that golden parachutes are associated with a decrease in firm value, a greater likelihood of acquisition, and a lower acquisition premium. Overall, the literature finds mixed evidence on the relation between golden parachutes and shareholder wealth.

[1] For the purpose of this research, the term golden parachute refers to severance payments to departing CEOs regardless of whether or not there is a change in control. While the existing literature describes golden parachutes as applying only when a change in control occurs, upon examining a sample of 50 recent proxy filings we find that most of these payouts apply regardless of whether there is a change in control.

We focus on the debt market for several reasons. First, although the debt market is one of the largest markets in the world and it is dominated by sophisticated institutional investors, existing research has largely ignored how individual governance mechanisms such as golden parachutes affect the pricing of public corporate debt. Second, since bonds have shorter durations than equity, their valuations are well specified and less subject to the criticism that the results might be driven by misspecification of the equilibrium asset pricing model when compared to equity valuations. Third, bonds are less subject to endogeneity as causality is unlikely to be an issue. That is, a change in whether the firm has a golden parachute can cause yields to change, but it is unlikely that changes in yield spreads will cause firms to adopt or remove golden parachutes from their compensation contracts (our econometric tests also find no evidence of endogeneity in the yield spread specifications).

We hypothesize that CEOs with golden parachutes have an incentive to increase firm risk and decrease effort and this would lead to a higher cost of debt capital. We examine this hypothesis using panel data from a large sample of publicly traded firms covering the period from 1990 to 2006. We find a significant and positive association between the use of golden parachutes and bond yield spreads. Specifically, we find that firms in which the CEO has a golden parachute have yield spreads that are about 12% higher than similar firms without golden parachutes. This result is robust to controlling for credit rating, the likelihood of a takeover attempt, institutional ownership, state laws, golden parachute adoption (new vs. old), and firm-specific fixed effects.[2]

To establish that the presence of golden parachutes causes a higher cost of debt, we conduct a natural experiment using the IRS tax ruling adopted in January, 1 2004. This ruling contains two parts: Section 280G prohibits corporations from deducting golden parachute payments, and Section 4999 imposes an additional 20% excise tax on the excess parachute payment for the executive.[3] Because CEOs of firms which still receive an excessive payout are subject to an excise tax, this implies smaller incentives for the CEO from the golden parachute.[4] This IRS

[2] Takeovers often, but not always, have a negative impact for debt holders (see, e.g., Asquith and Wizman, 1990; and Billet, King, and Mauer, 2004).

[3] Excess parachute payments are defined as payments at least three times the executive base salary made to a an employee or independent contractor who is either an officer, shareholder, or highly compensated individual at any time in that year, contingent upon the occurrence of a change of control for the firm.

[4] Examining several severance packages, we find that firms decrease the packages they offer the CEO around the IRS ruling change date to avoid the excess parachute payment.

ruling is exogenous as firms did not lobby congress for it and had no incentive to do so. Therefore, the adoption of this ruling is a natural experiment that we can use to study the effect of exogenous changes in golden parachutes on changes in the cost of debt. We compare changes in the cost of debt for golden parachute and non-golden parachute firms using a difference-in-difference specification. We find that the difference in bond yield spreads between golden parachute and non-golden parachute firms is smaller after the adoption of the IRS rules. Thus, the effect of golden parachutes on bond spreads is diminished when the economic value of the parachute to the CEO decreases. This evidence suggests that changes in the adoption of golden parachutes cause changes in yield spreads, confirming our main regression results.

We next examine the relation between the use of golden parachutes and firm risk, operating performance, and CEO turnover. Lys, Rusticus, and Sletten (2007) argue that, when managers are risk averse, the use of large severance agreements provides managers with downside protection in addition to rewards for exceptional stock performance. This downside protection induces managers to undertake risky projects which in turn will increase the cost of capital. Alternatively, Yermack (2006) provides evidence that firms are motivated to adopt golden "handshakes" to mitigate managerial problems including inadequate risk-taking, shirking, entrenchment in office, and incomplete disclosure. Similarly, Rau and Xu (2010) find that contingent severance pay is promised in advance for managers to provide insurance for their human capital value and compensate them for the risks they undertake.

The literature also provides evidence about how the Gompers, Ishii, and Metrick (2003) governance index of shareholder rights is associated with decreased CEO effort. Core, Guay, and Rusticus (2006) examine the association between corporate governance, as proxied by the Gompers et al. (2003) index of shareholder rights, and operating performance. Core et al. find a significant negative association between governance and return on assets, which suggests that badly governed firms have greater agency costs. Bertrand and Mullainaithan (2003) also find that managers who are more insulated from the takeover market are less likely to take risks and more likely to "enjoy the quiet life." We hypothesize that CEOs with golden parachutes also have higher turnover. This greater turnover would reflect the increased risk and decreased effort associated with golden parachutes, and the fact that CEOs with golden parachutes are more willing to be dismissed from their positions.

Empirically, we test whether golden parachutes have an effect on CEO incentives. Using a sample of publicly traded debt, we find that firms which adopt golden parachutes exhibit increases in firm volatility (both idiosyncratic risk as well as total risk). Firms with golden parachutes also have weaker industry-adjusted returns on assets. Moreover, firms with golden parachutes are more likely to have the CEO leave the firm, and again this holds even if we exclude firms which faced a takeover attempt. Overall, these findings are consistent with an increase in risk and a decrease in effort for CEOs with golden parachutes.

Our paper contributes to the literature on the effect of golden parachutes on security prices. We provide evidence that the use of golden parachutes implies a higher cost of debt. Moreover, we show that the increase in the cost of debt associated with golden parachutes coincides with an increase in firm risk, a decrease in profitability, and an increase in CEO turnover. The evidence that golden parachutes are not beneficial to bondholders contrasts with the prior findings that a higher value to the Gompers, Ishii, and Metrick (2003) governance index is associated with a decrease in the cost of debt (see, e.g., Klock, Mansi, and Maxwell, 2005, and Cremers, Nair, and Wei, 2007). However, the incentive effects of golden parachutes differ from the incentive effects of other governance index components. Our finding that golden parachutes increase the cost of borrowing complements the results of Bebchuk, Cohen, and Wang (2010) who find that firms adopting a golden parachute have a lower industry-adjusted Tobin's Q, and that their value declines during the period of adoption and continues to erode subsequently.

The remainder of the paper is organized as follows. Section 2 develops our hypotheses and provides background literature. Section 3 discusses the data and variable measurement. Section 4 provides our results on the relation between golden parachutes and the cost of debt and augments our evidence using a natural experiment. Section 5 presents our results on how golden parachutes affect CEO incentives with respect to risk and effort. Section 6 concludes.

2. Golden parachutes, the Cost of Debt, and Firm Behavior

2.1. Golden Parachutes and CEO Incentives

We begin by providing an intuitive discussion of the implications of golden parachutes for CEO behavior. More formal models of effort, risk-taking, and incentives exist (see, e.g., Holmstrom and Milgrom, 1987; Prendergast, 2002). A few papers also theoretically address how golden parachutes are related to management compensation and effort (see, e.g., Lambert and Larcker, 1985; Knoeber, 1986). However, we believe that the implications here are sufficiently straight-forward that a formal model is not necessary.

In a standard principal-agent model, the agent is risk-averse whereas the principal is not. Because golden parachutes provide large payouts in cases of termination, demotion, or resignation, this implies a new set of incentives for the CEO. Specifically, CEOs with golden parachutes have an incentive to increase risk relative to those who do not have these provisions in their contracts (and see also Lys, Rusticus, and Sletten, 2007, and Muscarella and Zhao, 2012). If the additional risk pays off, the CEO will be compensated for good performance. If the additional risk does not pay off, the firm is more likely to fire the CEO. With a golden parachute, this downside has fewer negative consequences for the CEO. Thus, all else equal, we hypothesize that the adoption of a golden parachute implies greater firm risk, and this relation holds even when considering those firms that did not receive a takeover bid.[5]

Similarly, a CEO with a golden parachute may have an incentive to reduce his/her effort. If this lower effort implies that their employment is more likely to be terminated, the CEO would still be able to receive a golden parachute. Again, since golden parachutes provide large payouts to the CEO, we hypothesize that golden parachutes are associated with the CEO leaving more often. Moreover, we hypothesize that this relation holds even when the firm does not receive a takeover bid.

2.2. Golden Parachutes and Bondholder Wealth

The existing literature on the relation between golden parachutes and equity values provides mixed results. Lambert and Larcker (1985) find a positive shareholder response to the adoption of golden parachutes, while Brusa, Lee, and Shook (2009) and Bechuck, Cohen, and

[5] Yermack (2006) discusses the incentive effects of separation packages (or golden handshakes). He argues that these contracts may be optimal because they serve as an instrument of damage control when CEOs are ousted, helping the board to protect corporate secrets and heading off litigation or adverse publicity. In our sample of golden parachutes, which includes a sub-sample of golden handshakes, we find no evidence of positive effects of these contracts.

Wang (2010) find that golden parachutes are negatively associated with equity value. We instead focus on the effect of golden parachutes on bondholder wealth. Given our hypotheses above, we discuss the effects of golden parachutes on the cost of debt financing through takeovers, risk taking, and effort.

Takeovers can decrease the value of the target firm's debt (see Asquith and Wizman, 1990), and this effect can be larger for high-grade bonds (Billet, King, and Mauer, 2004). An increase in the probability of a takeover could therefore increase the firm's cost of debt. Moreover, Hartzell, Ofek, and Yermack (2004) show that golden parachutes are associated with a larger payout to the CEO and a smaller payout to shareholders. Thus, takeovers associated with golden parachutes may be less advantageous for the firm's other stakeholders. An increase in risk taking would also be associated with a decrease in debt value (Campbell and Taksler, 2003). Further, CEO turnover is associated with an increase in equity volatility (Clayton, Hartzell, and Rosenberg, 2005), and an increase in the cost of debt capital (Adams and Mansi, 2009). Lastly, if the CEO puts in less effort, this may decrease firm value, and this could also imply an increase in the cost of debt. Thus, the theoretical implications of golden parachutes for bond values are overwhelmingly negative. We therefore hypothesize a positive relation between the use of golden parachutes and bond yield spreads.

In contrast, other components of the Gompers, Ishii, and Metrick (2003) governance index decrease the ease of hostile takeovers, and therefore they insulate management from the market for corporate control. Managers with more antitakeover protection may therefore decrease risk (Bertrand and Mullainathan, 2003), and this leads to a lower cost of debt (Klock, Mansi, and Maxwell, 2005; Cremers, Nair, and Wei, 2007). We argue that the incentive effects of golden parachutes differ from the incentive effects of other governance index components.[6]

3. Data and Variable Measurement

3.1. Data Sources

[6] An important related question is, given the negative incentive effects, why are golden parachutes included in CEO compensation contracts? We do not address this question in this analysis, as we instead focus on the implications of golden parachutes for CEO behavior and debt value. However, one possibility is that golden parachutes are a case of faulty contract design that has spread through the marketplace for CEOs (see, e.g., Hillion and Vermaelen, 2004).

We utilize seven databases in our analysis of the impact of golden parachutes on the cost of debt financing. These include: (i) Lehman Brothers (LBFI) Fixed Income databases for bond characteristics and pricing information, (ii) RiskMetrics corporate governance database for antitakeover provisions including golden parachutes and severance agreements, (iii) Compustat Industrial Annual database for financial information, (iv) executive compensation (Execucomp) database for information on top executives characteristics and compensation, (v) CRSP database for stock prices and returns information, (vi) Thomson Financial Institutional Ownership (13F) database for institutional ownership information, and (vii) SDC database for mergers and acquisitions information.

RiskMetrics reports data on antitakeover provisions every two to three years (in the years 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006). To construct a continuous dataset, we follow the standard in the literature and fill the missing years by assuming that the provisions in any given year were in place in the years preceding the publication date. We also exclude financial firms with SIC codes from 6000 to 6999 due to the non-comparable financial structures in these industries. The final dataset consists of 22,931 firm-year observations on 2,730 firms covering the years from 1990 to 2006.[7] For a firm-year observation to be included in our analysis, the firm must be present in the RiskMetrics database and must have a debt issue available in the LBFI database. Financial information must also be available in the Compustat database and stock pricing information in CRSP. Additional information on institutional and insider ownership is collected from the Execucomp and Thomson Financial databases for a subsample. Merging the databases and applying these requirements yields a data set of 4,614 firm-year observations for 780 firms for the years from 1990 to 2006.[8]

[7] Note that the sample cutoff year of 2006 is not arbitrary. In late 2006, the original provider for golden parachute data, the Institutional Responsibility Research Center (IRRC), was acquired by RiskMetrics. Upon manual examination of SEC filings, it appears that RiskMetrics changed the methodology for collecting golden parachutes for the years 2007 and 2008 to include only severance packages in excess of those three times the annual salary for the CEO, which is not in line with the prior IRRC methodology. The U.S. tax code implies different consequences if the severance package is three times or more the annual salary, and many golden parachutes are set to just below this threshold. RiskMetrics reversed its methodology in 2009 to put in all golden parachutes. We therefore also examine the results using the data in 2009 and filling in for the years 2007 and 2008 and find similar results.

[8] To minimize survivorship bias, we allow firms to exit and reenter the data set.

3.2. Measuring the Cost of Debt

We use the LBFI database to measure a firm's cost of debt. The final dataset contains month-end security specific information such as bid price, coupon, yield, credit ratings from Moody's and S&P, duration, issue, and maturity dates on nonconvertible bonds that are used in the Lehman Brothers bond indexes. Securities are included based on firm size, liquidity, credit ratings, maturity, and trading frequency. We limit our analysis to only the fiscal year-end prices and yields so as to coincide with firm accounting data.

The dependent variable, the log of the yield spread or bond risk premium, is used to measure the cost of debt financing. The yield spread is defined as the difference between the yield to maturity on a corporate bond and the yield to maturity on its duration equivalent Treasury security. For firms with multiple observations in the sample, a weighted average yield spread is computed, with the weight being the amount outstanding for each security divided by the total amount outstanding for all available publicly traded debt. In the cases where no corresponding Treasury yield is available for a given maturity, the yield spread is calculated using interpolation based on the Svensson (1994) model (or the modified Nelson and Siegel, 1987, exponential functional form).

3.3. Measuring Golden Parachute and Firm Risk

We measure golden parachutes using a dummy variable that equals one if the firm has a golden parachute in the compensation contract for its CEO. RiskMetrics currently defines a golden parachute as a severance contract payable in the event of a change in control or any severance payment greater than three times salary plus bonus. We also utilize two additional variables to capture the firm's use of golden parachutes: (i) a dummy variable that equals one if a golden parachutes is adopted in the current year but is not in place in the previous year based on the filled dataset (Add Golden Parachute), and (ii) a dummy variable that equals one if a golden parachute is adopted in the current year that existed in the previous year based on the filled dataset (Keep Golden Parachute).[9]

[9] We also examine the results using a dummy variable that equals one if a golden parachute is adopted in a previous year but is not in place in the current year (i.e., if it was removed) and find insignificant results.

We include the Gompers, Ishii, and Metrick (2003) governance index (GIndex) based on 24 antitakeover provisions from the RiskMetrics dataset for the years 1990 to 2006. We also include a subset of the GIndex based on the Bebchuk, Cohen, and Ferrell (2009) entrenchment index of six antitakeover provisions (classified boards, golden parachutes, limits to amend charter, limits to amend bylaws, supermajority, and poison pill) for the entire dataset covering the years 1990 to 2006. Bebchuk et al. (2009) find that the six variables in the entrenchment index are sufficient to capture the impact of all the antitakeover provisions on stock value. As golden parachutes are considered separately, we exclude them from these indices.

For the firm risk analysis, we use both total risk and idiosyncratic risk. We measure total risk as the natural logarithm of the annualized variance of daily returns. For idiosyncratic risk, we follow Low (2009) and compute idiosyncratic risk as the natural logarithm of the annualized variance of the residuals from the market model. Specifically, we obtain daily stock prices from CRSP to calculate daily stock returns for each firm in the sample over the period 1990 to 2006. The firm's daily stock return is the dependent variable in the market model. We use the CRSP value weighted market portfolio as our measure of market returns, and we adjust for non-synchronous trading by adding five leads and five lags of this portfolio (Dimson, 1979).

For the performance analysis, we follow Core, Guay, and Rusticus (2006) and use three measures: operating income before depreciation scaled by total assets (ROA1), operating income after depreciation scaled by total assets (ROA2), and firm annual sales growth (Sales Growth). All three measures are computed net of the industry median using the Fama and French (1997) industry classifications.

3.4. Control Variables

The remaining variables are firm and security specific controls. Firm-specific controls include firm size, leverage, profitability, market-to-book, sales growth, and volatility. Firm size (Size), a proxy for economics of scale and a takeover deterrent, is measured as the natural log of total assets. Firm leverage (Leverage), a proxy for financial health, is measured as the ratio of total debt to total assets. Firm profitability (Profitability), a proxy for financial performance, is measured as the ratio of earnings before interest, taxes, depreciation, and amortization scaled by total assets. Sales growth (SGrowth) is the firm's annual growth in revenue. Market-to-book

ratio, a proxy for growth opportunities, is computed as the market value of assets (measured as the number of shares outstanding times share price plus the book value of debt) scaled by the book value of assets. Firm volatility (Volatility) is the annualized standard deviation of the residuals from the market model of daily returns. Given a small number of extreme observations and to ensure that outliers are not driving any of our results, we winsorize the variables size, leverage, market to book, and profitability at the 1% level.

Security specific variables include credit ratings, duration, convexity, and liquidity. Firm credit rating (Rating) is the average of Moody's and S&P bond ratings and represents the average firm credit rating at the date of the yield observation.[10] Bond ratings are computed using a conversion process in which AAA rated bonds are assigned a value of 22 and D rated bonds receive a value of 1.[11] One methodology used in the literature allows for the fact that the credit rating variable may incorporate part or all of the information from governance factors. As such, we estimate the impact of credit rating excluding the effect of golden parachutes. That is, we regress the rating variable on the golden parachute variable, and the error term in this case incorporates the credit rating information without the influence or impact of golden parachutes. In this first stage, we find that golden parachutes are negatively and significantly related to credit ratings. The error term from this regression is labeled Credit Rating and represents our primary measure of ratings in the multivariate analysis (for a similar analysis, see Klock, Mansi, and Maxwell, 2005; or Qi, Roth, and Wald, 2010).[12]

We control for term structure effects using debt duration and convexity, and for liquidity effects using debt age. For an individual security, duration (Debt Duration) is defined as the discounted time weighted cash flow of the security divided by its price, and this captures the first derivative of price with respect to yield. Debt convexity is the rate of change (second derivative) in the price-yield relation and represents the non-linear portion of the term structure of interest rates. To proxy for liquidity, we use the log of bond age (Debt Age), where the age of the bond is the length of time (in years) that a bond has been outstanding. For firms with multiple bonds, we compute the weighted average durations, convexities, and ages using the

[10] If only one rating is available from Moody's or S&P is available, we use that one in our analysis.

[11] For more information on the conversion numbers for both Moody's and S&P firm bond ratings used in this study, see Table 1 in Anderson, Mansi, and Reeb (2003).

[12] For robustness, we use the raw credit rating variable in our specifications and find similar results. We also allow for a non-linear relation between bond yield spreads and credit ratings by using a binary variable (HighYield) that takes a value of one when the debt is non-investment grade and find similar results.

summation of the weighted durations, convexities, and debt ages of all bonds for each firm, with the weight being the amount outstanding for each debt issue divided by total amount outstanding for all publicly traded debt for the firm.

We also control for various governance structures that are known to impact takeovers and the cost of debt. These include institutional holdings and state laws restricting payouts. Institutional ownership is the ratio of shares owned by institutions divided by the total number of shares outstanding. Our variable for state laws restricting payouts is the total asset constraint (TA Constraint), equal to the minimum asset to debt ratio for a payout to be made. The prior literature shows that these laws affect capital structure (Wald and Long, 2007) and the cost of debt (Mansi, Maxwell, and Wald, 2009). In states like New York and Texas, this variable equals 1, in California this variable equals 1.25, and in Delaware this variable equals zero.

We also utilize CEO age, measured as the age of the CEO at the year of observation. We follow Jenter and Lewellen (2010) who find that retirement preferences of target CEOs have first-order effects on both bidder and target behavior, and use a dummy variable for the age of CEO in excess of 65 years (CEO Age > 65) as an additional control variable. We measure CEO tenure as the number of years a CEO has been in office. We also consider two additional variables: (i) a dummy variable that equals one if a CEO left the firm (CEO Leaves Firm), and (ii) a dummy variable that equals one if a CEO left office (CEO Leaves Office). Finally, given that our variables are sensitive to time periods and industry effects, we control for both effects using two-digits SIC codes and year dummies. Table 1 provides a complete description of the variables used in the analysis.

[Insert Table 1 about here]

3.5. Descriptive Statistics

We begin the analysis by considering how the incidence of golden parachutes changes over time. Panel A of Table 2 reports the incidence of golden parachutes from 1990 to 2006 using the RiskMetrics database. Panel A shows that during the period from 1990 to 2006, the percentage of firms with golden parachutes increased monotonically from about 50% to 78%. The RiskMetrics database also provides information on severance agreements, but the use of these

agreements have declined steadily over time and in 2006 the variable stood at 3.5% of the sample. Since most golden parachutes include severance-like language, considering separate severance contracts is less meaningful.

[Insert Panel A of Table 2 about here]

Panel B of Table 2 reports summary statistics for the sample segmented based on whether a firm has adopted a golden parachute or not. We include the mean, median, and standard deviation for the segmented samples. Firms with golden parachute contracts have higher yield spreads (mean and median values 297, and 183 basis points, respectively) than those without golden parachutes (mean and median values of 258 and 152 basis points, respectively). The mean differences between the two groups are statistically significant at the 1% level. Since the mean and median values deviate largely from one another, the yield spread variable is highly skewed. Therefore, we use the log of the yield rather than the level yield spread value in our multivariate analysis.[13]

[Insert Panel B of Table 2 about here]

For the golden parachute sample, the variable total assets has a mean of $3.9 billion, a median of $1.3 billion, and a standard deviation of $7.6 billion, respectively. The mean and median leverage (short term plus long term debt) ratios is 46% with a standard deviation of 19%, which indicates that a large portion of the sample consist of firms that have significant liabilities in their capital structure. The firms are profitable with mean and median profitability ratios of 13%. Firms on average, have a market-to-book ratio of 1.68, and equity volatility of 43%. Institutions, on average, owned 65% of the shares outstanding with a standard deviation of 23%. Firms have mean and median governance indices of about 10 provisions and a median entrenchment index of about 3 provisions. CEOs, on average, own 1.7% of the firm's shares, have tenure of 7 years, have left their positions in 10% of the data, and are 56 years of age. The remaining variables are security specific. The median bond rating variables for the full sample roughly equate to an S&P rating of BBB, which indicates that the sample has a mean rating just

[13] Rerunning our specifications without taking the log of the yield spread does not materially change the statistical or economic significance of the results.

above non-investment grade debt. Bond ratings are lower for the sample with golden parachutes than for the sample without golden parachutes and the difference between the two samples is statistically significant. The mean traded debt has duration of 5.8 years and has been outstanding for 3.6 years.

Panel C of Table 2 describes the industry distribution of the sample using the Security Industry Classification (SIC) codes. Although we use two digit SIC codes to control for industry effects in our empirical analysis, for brevity we only report one digit SIC codes in our descriptive analysis. Based on our segmentation of golden parachutes, it seems that there are no major differences in the concentration of industries between the two samples. Most of the firms in the overall sample are in manufacturing (52%), transportation and communications (15%), services (14%), and whole trade sectors (13%). The smallest concentrations of firms occur in the agriculture and forestry and public administration sectors.

[Insert Panel C of Table 2 about here]

4. Golden Parachutes and Bond Yield Spreads

4.1. Primary Specifications

We examine the relation between the presence of golden parachutes and bond yield spreads while controlling for other factors that are known to influence yield spreads. We perform multivariate regressions using a variety of pooled cross-section and time-series as well as firm fixed effects. We use clustered standard errors at the firm level as in Petersen (2009) to compute the *t*-statistics. Our primary regression model is

$$\begin{aligned} Ln(Spread_{i,t}) = {} & B_0 + B_1\,(GoldenParachute_{i,t}) + B_2\,(EIndex - GP_{i,t}) + B_{3\text{-}8}\,(FirmSpecific_{i,t}) \\ & + B_{9\text{-}12}\,(Security\ Specific_{i,t}) + B_{13}\,(TA\ Constraint_{i,t}) \\ & B_{14\text{-}30}\,(Time\_Dum_{i,t}) + B_{31\text{-}118}(Industry\_Dum_{i,t}) + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Our principal concern in the analysis is the golden parachute coefficient estimate, B_1. A significant positive coefficient would provide support for the hypothesis that the use of golden parachutes is value decreasing to bondholders.

Panel A of Table 3 summarizes the results of our regressions of the effect of golden parachutes on the cost of debt financing. Model 1 provides our baseline specification. Model 2 considers whether the golden parachute provision was recently adopted or was previously in existence. Model 3 is similar to Model 1 but includes the Gompers, Ishii, and Metrick (2003) governance index instead of the entrenchment index of Bebchuk, Cohen, and Ferrell (2009). Model 4 reports the primary specification with firm fixed effects similar to that in Coles, Lemmon, and Meschke (2003). Model 5 utilizes an unfilled sample as in Bebchuk et al. (2010), where we do not replace years without governance data by the governance data in the last available year.

[Insert Panel A of Table 3 about here]

Across all specifications, we find a positive and significant relation (at the 1%level) between golden parachutes and the cost of debt financing, indicating that bondholders view golden parachutes as a device that does not protect their interests. The coefficients across models vary from 0.119 for the unfilled sample to 0.157 for the fixed effects specification. This translates to an increase in bond yield spread of about 12% to 16%, on average, across models. As an average firm in our sample has a spread of 283 basis points, these estimates imply an increase of 33 to 44 basis points in spread with the adoption of a golden parachute. Note that Model 2 shows that the coefficients on the Add and Keep golden parachutes are positively related to the cost of debt, with a magnitude of 9% for the add golden parachute and 12% for the keep golden parachute. Therefore, we cannot reject the hypothesis that the coefficients on these two variables are equal. Overall, the results indicate that golden parachutes are not beneficial to bondholders, and that this is reflected in lower pricing of corporate debt. Moreover, reverse causality is not a concern in this analysis as bond spreads do not affect the use golden parachutes.[14]

[14] We test this assertion directly by examining a probit model where the dependent variable is whether the firm adds a golden parachute in a given year and the independent variables are lagged firm ratings, yield spreads, and other firm characteristics. In this analysis, lagged ratings and spreads are not a significant determinant of whether the firm adds a golden parachute.

The control variables across all models have their expected signs, and in general, are statistically significant. We find that firm size, sales growth, profitability, growth opportunities, and total asset constraint are negatively associated with yield spreads, while firm leverage and volatility are positively related to bond yield spreads. Our debt specific variables (credit ratings, debt age, and debt convexity) are all positively related to spreads. Similar to the results of Bohjraj and Sengupta (2005), we find that institutional ownership is negatively related to yield spreads, and this evidence is consistent with monitoring.

4.2. Robustness Testing

We also provide additional robustness tests in Panel B of Table 3. We are mainly concerned with whether golden parachutes are associated with bond spreads purely because of the increase in takeover probability, or whether golden parachutes impact bond spreads because of changes in risk and CEO effort. If the effect of golden parachutes is purely due to takeovers, we would expect to see a more negative effect on bondholders of high-grade debt, whereas the effect on low-grade or junk debt might be positive or insignificant (Billet, King, and Mauer, 2004, show the differential impacts of takeovers on differently rated bonds). Models 1 and 2 therefore segment the sample into investment and non-investment grade debt. Similar to our baseline specification, we find a positive and significant association between the adoption of golden parachutes and the cost of debt financing for both segments, although the magnitude is smaller for the investment sample at about 6% versus 13% for the non-investment sample.

[Insert Panel B of Table 3 about here]

Next, we directly control for the probability of takeover using the estimated probability of a takeover attempt as an additional control variable. We measure takeover attempts using a dummy variable that equals one if a firm receives an initial bid (Attempt). For our analysis on takeover attempts, we obtain mergers and acquisitions data for the years 1988 to 2008 from the Securities Data Corporation (SDC Platinum). We extend the mergers and acquisitions data two years beyond our original sample period to ensure that initial bids are precisely defined. We include all acquisition deals coded as "mergers, acquisitions, and acquisitions of majority interest" and exclude spinoff acquisitions. Following Bates and Lemmon (2003), we define a bid

as an initial bid if there are no other bids for 365 days before the announcement date. The final sample contains 10,224 initial bids from the years 1990 to 2006. This dataset is merged with our annual data from RiskMetrics resulting in 1,217 initial bids. We include firm characteristics as independent variables in the first-stage procedure, and also include whether the firm has a golden parachute. Similar to Machlin et al. (1993) and Bebchuk et al. (2010) having a golden parachute significantly increases the probability of the firm receiving a bid.[15]

Model 3 adds these additional estimated probabilities.[16] As in our other specifications, the estimated coefficient on golden parachute continues to be positive and significant after controlling for the predicted probability of takeovers, although the estimated coefficient is slightly lower. A higher probability of a takeover bid also implies a slightly lower yield spread, although this result is not statistically (or economically) significant. Overall, the results show that the use of golden parachutes is associated with higher yield spreads, and that this relation cannot be explained purely by an increase in takeover risk.

Models 4 and 5 consider two main governance mechanisms: board structure and CEO compensation, both of which have been shown to affect the cost of capital (see e.g., Anderson, Mansi, and Reeb, 2004). We control for board of directors because boards are responsible for assigning golden parachutes to senior executives. We proxy for board structure using Board Size equal to the log of the number of directors on the board, and board independence (Outside Ratio) equal to the ratio of independent directors to total directors. We control for the structure of CEO equity-based incentives using pay for performance sensitivity (PPS) and the volatility of the PPS (Vega) as in Brick, Palmon, and Wald (2012), both of which affect effort and risk taking incentives. PPS is computed as the log of the change in CEO wealth for a 1% change in stock price, and Vega is measured as the log of the dollar change in compensation that is caused by a 1% point change in stock volatility. In both models, we continue to find a positive and significant relation between the use of golden parachutes and the cost of debt financing. The results also confirm the findings of a negative relation between board size and the cost of debt (Anderson, Mansi, and Reeb, 2004), and the negative relation between PPS and Vega and the cost of capital.

[15] We also examined the relation using completed acquisitions and find similar results.

[16] As these probabilities are estimated from a prior regression, we are careful to correct the estimated standard errors for this two-stage procedure. Specifically, we bootstrap the standard errors while clustering by firm, where each bootstrap iteration estimates both the first and second stage regressions.

4.3. Using the 2004 IRS Rule Change as a Natural Experiment

4.3.1. Description of the Natural Experiment

In this section, we examine whether the relation between the presence of golden parachutes and bond yield spreads is robust to the use of a difference-in-difference (DiD) estimation method. We consider the imposition of the IRS's revenue rule 2004-87 (Sections 280G and 4999), which was designed to limit the increase in executive compensation associated with golden parachutes, as a natural experiment. Section 280G prohibits corporations from deducting golden parachute payments, and Section 4999 imposes an additional 20% excise tax on the excess parachute payment for the executive. In response to these rule changes, firms decreased the size of their severance package to avoid the additional tax, and also to avoid the appearance of making "excess" payments. Thus, while the rule impacts change in control payouts only, the effect appears to have applied to other parts of CEOs' severance agreements. We use these changes in IRS regulations to identify an exogenous change in the value of golden parachutes to the CEO that does not otherwise affect the cost of debt.

For the tax rule to be a valid test in our study, the event must be exogenous. As this change in tax rules was not lobbied for by firms, it can safely be considered an exogenous event. While this tax rule was finalized in 2004, the imposition of such a rule was discussed as early as 1989. If the rule was well anticipated before 2004, the DiD setup may be imprecisely timed, and we may not capture correctly the changes in the outcome because changes in behavior may have occurred prior to the actual rule change. In this case, a draft version of the golden parachute tax proposal rule was considered in 2002. Bertrand, Duflo, and Mullainathan (2004) and Roberts and Whited (2011) suggest several ways to address potential concerns about the timing of the onset of a shock. They suggest repeating the DiD analysis on pre-event years and falsely assuming that the onset of treatment occurs one, two, or three years before it actually does. If the natural experiment is correctly timed, the DiD estimators of these falsification tests should not be statistically different from zero.

4.3.2 Data and Sample

On August 1, 2003, the Treasury Department released final regulations interpreting the golden parachute tax rules - sections 280G and 4999 of the Internal Revenue Code. This final regulation is effective for any payment contingent on a change in ownership or control if the change occurs on or after January 1, 2004. The IRS previously proposed regulations under Section 280G in 1989; however, these were never finalized. We use January 1, 2004 as the date on which golden parachutes are affected by the change in IRS tax rules.

Our treatment group is the firms with golden parachutes that would be subject to the new tax rules, and our control group is the firms without golden parachutes. The DiD approach is beneficial because it combines two effects. The cross-sectional comparison avoids the problem of omitted trends by comparing two groups over the same time period, and the time series comparison avoids the problem of unobserved differences between the two groups by looking at the same firms before and after the change. In our DiD estimation, we compare the treatment firms before and after the shock to the control firms before and after the shock. After controlling for other variables, this approach confirms our results that changes in the cost of debt are caused by changes in the incentive effects of golden parachutes.

4.3.3 Results

Panel A of Table 4 provides descriptive statistics for the sample with golden parachutes (treatment) and the sample without golden parachute (control) before the enactment of the 2004 IRS tax rule for the three years 2001 to 2003. Included are the means, medians, and standard deviations of the treatment and control group as well as the differences in means tests (reported in p-values). We find that firms with golden parachutes have higher mean and median bond yield spreads, smaller total assets, higher leverage, lower profitability, and higher volatility than firms without golden parachutes. The mean differences are statistically significant for all the variables with the exception of idiosyncratic risk.

[Insert Panel A of Table 4 about here]

Next, we examine the results using a DiD estimation. Panel B of Table 4 reports the results for our specification in the two years around the tax rule change (2003 to 2004) and in the six years around the rule change (2001 to 2006). Models 1 and 3 take into consideration year and

industry effects. Models 2 and 4 control for firm fixed effects. In all specifications, we find that the interaction term between golden parachute and Tax Rule is negative, even after we control for firm fixed effects. For the average golden parachute firm in the sample, the yield spread decreases by 10% to 16%. Models 5 and 6 follow Bertrand and Mullainathan (2003) and examine the effects of the exogenous event in every single year after the imposition of the tax rule. As expected, the coefficient on the interaction term between golden parachute and the year 2003 is economically and statistically insignificant. However, the interactions between golden parachutes and the years 2004, 2005, and 2006 are negative and significant. In general, the results support the hypothesis that the effect of the tax rule is insignificant before 2004 and effective afterwards.[17]

[Insert Panel B of Table 4 about here]

As a falsification test, we check our results under the assumption that the onset of the event occurred before 2004. That is, we test the results assuming that the event occurred in 2001, 2002, and 2003. Panel C of Table 4 reports the results for three periods 2002-2003, 2001-2002, and 2000-01. Models 1, 3, and 5 are the baseline specifications. Models 2, 4, and 6 are similar specifications but with firm fixed effects. In all regressions, we find an insignificant relation between the interaction term (golden parachute and tax rule) and the cost of debt, which supports our argument that the imposition of the actual tax rule in 2004 affected the cost of debt financing.

[Insert Panel C of Table 4 about here]

In an unreported analysis, we construct a balanced sample where both the golden parachute and non-golden parachute firms have similar characteristics. That is, we consider only firms without missing data and we truncate the sample so that both groups have similar costs of debt, total assets, leverage, market-to-book, profitability, and idiosyncratic risk. We again apply the DiD regression analysis to this smaller sample and find results similar to those in the original

[17] We also consider the sum of the coefficients on golden parachutes and the interaction of golden parachutes with the Tax Rule. This sum is positive and significant in Model 1 and positive and not significant in Models 3 and 5. Estimating the baseline regression for just the years after the Tax Rule change, we find a positive and significant coefficient with roughly half the magnitude of the coefficient estimated over the entire period. Thus golden parachutes still have a negative effect on bondholders after 2004, but the magnitude of this effect is diminished.

sample. This further alleviates concerns about other sample characteristics driving our results. For the sample used in our DiD tests, neither volatility, profitability, nor CEO turnover is significantly affected by the 2004 tax rule change. This finding is expected given that the changes in these variables are not easily detectable in the shorter time period.

5. Golden Parachutes and CEO Incentives

5.1. Golden Parachute and Firm Risk

Table 5 presents our segmented regression results from examining idiosyncratic risk and total risk as a function of whether the firm has added a golden parachute. We include the entrenchment index without golden parachutes, market-to-book, firm size, and leverage as firm specific control variables. To control for autocorrelation and mitigate any potential causality problem, we follow Brick et al. (2012) and include lagged volatility as an additional control variable in all the regressions. That is, even if past volatility leads to an increase in the use of golden parachutes, the marginal effects we capture are the increases in volatility due to a change in the addition of a golden parachute.[18] Models 1 and 5 summarize the results of the idiosyncratic and total risk regression including the Add Golden Parachute variable, respectively. We hypothesize that a CEO has an incentive to increase firm risk if the firm adds a golden parachute.

[Insert Table 5 about here]

In both models, we find a positive and significant relation between the adoption of a golden parachute and firm risk. The coefficients on Add Golden Parachute in both models are positive and significant at the 1% level. The regressions imply that on average a firm which adopts a golden parachute increases the annualized idiosyncratic and total risk of its stock return by about 9% under both specifications. The set of other entrenchment antitakeover provisions also has a significant impact on firm risk, though, in the opposite direction. In particular, if a firm adopts one more entrenchment antitakeover provision, aside from golden parachute, the annualized idiosyncratic and total risk of its stock returns decreases by 3%.

[18] The results are not sensitive to the number of lags used in this specification.

One alternative reason that golden parachutes may imply greater stock volatility is that they lead to more takeovers, not because they lead to more risk taking by the manager. We therefore explicitly consider the subsample of firm-year observations where there is no takeover attempt. Models 2 and 6 report the results for the subsample where no takeover attempts took place, and the results are unchanged for our coefficients of interest. The coefficients on Add Golden Parachute in both models are positive and significant at the 1% level, and on average, suggest that firms that adopt golden parachutes increase annualized idiosyncratic and total stock return risk by about 9%. This result is similar to the baseline specification, and suggests that the increase in risk is not just due to greater takeover risk.

Another alternative hypothesis is that CEOs have an incentive to reduce effort if a golden parachute is in place, and this leads to greater turnover. As Clayton, Hartzell, and Rosenberg (2005) show that CEO turnover implies greater stock return variability, the increase we find in stock volatility could therefore be due to changes in CEO turnover. We therefore repeat our analyses in Models 3, 4, 7, and 8 excluding any firm-years in which the CEO left the firm. The results are similar across the models with the addition of a golden parachute implying an increase in firm risk in the range of 10% to 11%, thus the increase in risk is not just due to greater turnover. Overall, the results suggest that the adoption of golden parachute is associated with an increase in firm idiosyncratic as well as total risk.

5.2. Golden Parachutes and Operating Performance

Research by Gompers, Ishii, and Metrick (2003) and Core, Guay, and Rusticus (2006) suggests that weak governance gives rise to agency costs which in turn lower operating performance. Consistent with this hypothesis, these authors document that weak governance is associated with lower operating performance. We extend their analysis by examining the relation between the adoption of golden parachutes (as a measure of poor incentives) and operating performance (as a proxy for CEO effort). In other words, we measure whether firms in which CEOs have golden parachutes have weaker cash flows than firms whose CEOs do not. We follow Core et al. and regress three measures of futures operating performance on golden parachutes using the Newey-West procedure with one lag to adjust for serial correlation. That is

$$Performance_{i,t} = B_0 + B_1\,(GoldenParachute_{i,t-1}) + B_2\,(Log\ MVE_{i,t-1}) + B_3\ (log\ MBE_{i,t-1}) + B_4\ (EIndex - GP)_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

where performance is one of three measures: (i) industry adjusted ROA before depreciation (ROA1), (ii) industry adjusted ROA after depreciation (ROA2), and (iii) industry adjusted annual sales growth (Ind. Adj. Sales Growth). The independent variables (all lagged one period) include GoldenParachute, a dummy variable that equals one if the firm has a golden parachute in the current period, (EIndex – GP) is the entrenchment index less golden parachute, logMVE is the log of market value of equity, and logBME is the log of book to market value of equity. A negative value on β_1 indicates that the presence of a golden parachute is associated with lower operating performance.

We utilize the methodology in Fama and McBeth (1973) and Core et al. (2006) and estimate the regressions by year and report mean and standard deviation of the time series as well as t-statistics of the overall regressions. The results for our three measure of operating performance are provided in Table 6. In all three models we find a negative and significant relation (at the 1% level) between the use of golden parachutes and firm performance. The evidence shows that the use of golden parachutes in the current period is associated with lower operating performance in the subsequent period, and this is consistent with golden parachutes implying decreased CEO effort.

[Insert Table 6 about here]

5.3. Golden Parachutes and CEO Turnover

We next consider whether golden parachutes impact the frequency of CEO turnover. Table 7 summarizes the results of probit regressions where CEO turnover is the dependent variable. Model 1 is our baseline specification and includes the effect of golden parachutes when a CEO leaves the firm. Model 2 is similar to Model 1 but only consider a subsample with no takeover attempts. Model 3 provides results where the dependent variable is whether the CEO leaves

office rather than leaving the firm. Model 4 is similar to Model 2 but again only considers the subsample with no takeover attempts.

[Insert Table 7 about here]

The results in Model 1 confirm the effect of a golden parachute in the previous year on the likelihood of CEO turnover in the current year. In particular, if a golden parachute is in effect in the prior year, the likelihood that the CEO leaves the firm this year will increase by approximately 11%. In Model 2, the coefficient of a golden parachute is generally the same in both its magnitude and significance level. The results from Models 3 through 4 are also similar; if a golden parachute is adopted last year, the likelihood of a CEO leaving their position this year will increase by about 8%, and this finding is significant at the 5% or 10% level depending on the specification. Overall, across all models the results indicate a higher likelihood of CEO departure if a golden parachute is in place.

6. Conclusion

Recently, under the Dodd-Frank Act of 2010, a great deal of attention has been given to provisions in compensation contracts known as golden parachutes. Golden parachutes are severance payments assigned to senior executives upon a triggering event such as termination, demotion, or resignation contingent on a change of control. In this paper, we examine the relation between the use of golden parachutes and the cost of debt and also show how golden parachutes affect CEO incentives with respect to risk and effort.

Using a sample of publicly traded debt covering the period from 1990 through 2006, we find that the adoption of a golden parachute in compensation contracts is associated with an increase in the cost of debt capital, and again this is consistent with greater risk taking and a decrease in CEO effort. Specifically, we find that firms whose CEOs have golden parachutes have yield spreads that are about 12% higher, on average, than similar firms without golden parachutes. This result is robust to controlling for a variety of variable including credit rating, likelihood of a takeover attempt, institutional ownership, state laws, golden parachute adoption (new vs. old), and firm-specific fixed effects. To address potential causality issues, we consider a natural experiment based on a 2004 IRS tax ruling. This natural experiment confirms our findings that

golden parachutes cause higher bond yield spreads. Examining other incentive effects of golden parachutes, we find that golden parachutes are associated with higher volatility, lower performance, and greater CEO turnover. Overall, the results suggest that golden parachutes is associated with a number of negative incentives for CEOs, and that bondholders are sensitive to governance mechanisms which change managerial incentives.

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Table 1. Variable Definitions

Variable	Description	Database
Yield Spread	Difference between the yield to maturity on a corporate bond and the yield to maturity on its duration equivalent Treasury security	LBFI
Golden Parachute	Dummy variable that equals one if a CEO has a golden parachute	RiskMetrics
Firm Size	Log of book value of assets (in $millions)	Compustat
Leverage	Long-term debt scaled by book value assets	Compustat
Profitability	Earnings before interest, tax, depreciation and amortization scaled by total assets	Compustat
Market-to-Book	The market value of assets scaled by the book value of assets	Compustat
Sales Growth	Annual sales growth in the firm's total revenue	Compustat
Idiosyncratic Risk	Natural logarithm of the annualized variance of the residuals from the market model	CRSP
Total Risk	Natural logarithm of the annualized variance of daily returns	CRSP
Volatility	Standard deviation of f the residuals from the market model of daily returns, annualized	CRSP
Abnormal Stock Return	The rolling mean monthly abnormal stock return over 12 month	CRSP
Rating	Average of Moody's and S&P ratings, computed using a scale between 22 and 1	LBFI
Credit Rating	Orthogonalized credit rating variable	LBFI
Bond Age	Log of number of years since bond issuance	LBFI
Duration	Macaulay duration or security's effective maturity	LBFI
Convexity	Second derivative of price with respect to yield	LBFI
EIndex	Entrenchment index of antitakeover rights	RiskMetrics
EIndex – GP	Entrenchment index less golden parachutes	RiskMetrics
GIndex	Gompers et al. (2003) index of antitakeover rights	RiskMetrics
GIndex – GP	Gompers et al. (2003) index of antitakeover rights less golden parachutes	RiskMetrics
Add Golden Parachute	Dummy variable that equals one if GP is adopted in current year but not in prior year	RiskMetrics
Keep Golden Parachute	Dummy variable that equals one if GP is adopted in current and prior years	RiskMetrics
Severance	Dummy variable that equals one if a company has a severance plan for its executives	RiskMetrics
CEO Age	CEO age while CEOs stays in the office	Execucomp
CEO Tenure	Number of years a CEO stays in the office	Execucomp
CEO Leaves Firms	Dummy variable that equals one if a CEO left the firm	Execucomp
CEO Leaves Office	Dummy variable that equals one if a CEO left her office	Execucomp
PPS	Pay-performance sensitivity, measured as the change in CEO wealth for a 1% change in stock price	Execucomp
Vega	Dollar change in compensation that is caused by a 1% change in stock volatility	Execucomp
Institutional Ownership	Number of shares held by institutions scaled by common shares outstanding	Thomson Fin.
TA Constraint	The minimum asset to debt ratio required before a payout can be made	Lexus/Nexus

Table 2. Sample Statistics

Panel A. Incidence of golden parachutes (by volume)

Year	Obs.	Golden Parachutes	Golden Parachute Additions	Golden Parachute Deletions	Golden Parachutes (%)
1990	1,114	552	N/A	N/A	49.55
1993	1,183	618	79	46	52.24
1995	1,228	656	67	34	53.42
1998	1,560	850	114	33	54.49
2000	1,479	937	181	23	63.35
2002	1,600	1072	146	12	67.00
2004	1,574	1148	115	24	72.94
2006	1,488	1158	89	12	77.82

Note: This panel provides information regarding the incidence of 11,226 (or 22,931 based on the filled sample) golden parachutes over the period from 1990 through 2006. The table presents the frequency, percentage of golden parachute adoptions, and number of firms with golden parachutes. N/A denotes not available. The data are presented in a volume-by-volume basis (i.e., without filled years).

Panel B. Descriptive statistics

	Golden Parachute			Non-Golden Parachute			
Variable	Mean	Median	Standard Dev.	Mean	Median	Standard Dev.	Diff. (4) – (7)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Yield Spread	296.96	183.45	465.29	258.15	152.23	409.19	6.75[c]
Rating	BBB-	BBB	A/B+	BBB	BBB+	A+/BB-	-10.14[c]
Debt Age	3.595	3.030	2.943	3.743	3.111	3.144	-1.76[c]
Debt Duration	5.814	5.615	2.203	6.016	5.819	2.351	-3.22[c]
Debt Convexity	0.571	0.405	0.488	0.628	0.451	0.535	-4.08[c]
Total Assets	3,920.31	1,255.97	7,614.32	4,568.77	1,016.78	9,602.14	-5.54[c]
Leverage	0.463	0.456	0.187	0.429	0.422	0.201	12.58[c]
Profitability	0.128	0.128	0.092	0.137	0.136	0.099	-7.22[c]
Volatility	0.427	0.339	0.307	0.461	0.367	0.330	-7.72[c]
Market-to-Book	1.678	1.357	1.014	1.895	1.441	1.282	-13.26[c]
ROA1	0.048	0.029	0.111	0.055	0.035	0.113	-4.68[c]
ROA2	0.045	0.026	0.111	0.052	0.033	0.114	-4.61[c]
Sales Growth	-0.020	-0.015	0.194	-0.003	-0.004	0.189	-6.11[c]
EIndex	2.719	3.000	1.059	1.145	1.000	1.064	110.08[c]
GIndex	9.881	10.000	2.460	7.750	8.000	2.592	62.87[c]
Inst. Ownership	0.646	0.673	0.230	0.543	0.554	0.230	29.99[c]
CEO Ownership	0.017	0.002	0.221	0.039	0.004	0.079	-7.25[c]
CEO Age	55.653	56.000	7.048	56.124	56.000	8.395	-3.75[c]
CEO Tenure	6.660	5.000	6.142	8.613	6.000	8.371	-16.72[c]
CEO Leaves Position	0.101	0.000	0.301	0.080	0.000	0.272	4.31[c]
CEO Leaves Firm	0.054	0.000	0.226	0.036	0.000	0.187	5.05[c]

Note: This panel provides summary statistics sorted by firms with golden parachutes. The overall dataset is comprised of 22,931 firm-year observations on 2,730 firms for the years from 1990 to 2006. Variable definitions are provided is in Table 1. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Panel C. Industry classifications

SIC Code	Industry Classifications	Golden Parachute Obs.	Golden Parachute (%)	Non-Golden Parachute Obs.	Non-Golden Parachute (%)
0	Agriculture and Forestry	31	0.23	30	0.33
1	Mining and Construction	812	5.90	407	4.44
2	Manufacturing (Food-Petroleum)	2,786	20.25	2,045	22.30
3	Manufacturing (Plastics-Electronics)	4,221	30.68	2,766	30.16
4	Transportation and Communication	2,231	16.21	1,316	14.35
5	Wholesale Trade	1,693	12.30	1,206	13.15
7	Services (Hotels-Recreation)	1,464	10.64	1,080	11.78
8	Services (Health-Private Household)	463	3.36	245	2.67
9	Public Administration and Other	59	0.43	76	0.83
	Total Observations	13,760	100	9,171	100

Note: This panel provides industry classification for the sample based on 1-digit SIC code. The data comprised of 22,931 firm year observations on 2,730 non-financial firms covering the period from 1990 through 2006.

Table 3. Golden Parachutes and the Cost of Debt

Panel A. Primary specifications

	Golden Parachute	Add & Keep Golden Para.	Governance Index	Fixed Effects	Unfilled Sample
	(1)	(2)	(3)	(4)	(5)
Golden Parachute	0.119[c]		0.121[c]	0.157[c]	0.127[c]
	(5.75)		(5.88)	(4.62)	(5.00)
Add Golden Parachute		0.090[b]			
		(2.40)			
Keep Golden Parachute		0.122[c]			
		(5.66)			
GIndex – EIndex			-0.010[a]		
			(-1.88)		
EIndex – GP	0.019[b]	0.017[a]	0.024[c]	0.058[b]	0.022[b]
	(2.21)	(1.88)	(2.71)	(2.51)	(2.29)
Firm Size	-0.048[c]	-0.049[c]	-0.047[c]	-0.074[b]	-0.036[c]
	(-4.32)	(-4.41)	(-4.17)	(-2.05)	(-2.63)
Leverage	0.375[c]	0.352[c]	0.379[c]	0.488[c]	0.371[c]
	(5.38)	(4.80)	(5.46)	(4.74)	(4.31)
Profitability	-1.175[c]	-1.086[c]	-1.167[c]	-1.273[c]	-1.169[c]
	(-6.21)	(-5.23)	(-6.21)	(-5.31)	(-5.46)
Sales Growth	-0.157[c]	-0.169[c]	-0.162[c]	-0.129[c]	-0.195[c]
	(-4.13)	(-4.32)	(-4.23)	(-3.27)	(-3.83)
Volatility	0.263[c]	0.241[c]	0.260[c]	0.242[c]	0.349[c]
	(5.99)	(5.54)	(5.96)	(6.90)	(6.39)
Credit Rating	-0.132[c]	-0.133[c]	-0.131[c]	-0.124[c]	-0.140[c]
	(-27.39)	(-26.86)	(-27.34)	(-12.16)	(-25.49)
Market to Book	-0.039[b]	-0.039[b]	-0.041[b]	-0.076[c]	-0.042[b]
	(-2.43)	(-2.37)	(-2.56)	(-3.28)	(-2.48)
Debt Duration	0.022	0.025[a]	0.022	0.029	0.033
	(1.54)	(1.74)	(1.53)	(1.64)	(1.64)
Debt Convexity	0.020	0.014	0.020	-0.041	0.007
	(0.32)	(0.22)	(0.33)	(-0.54)	(0.09)
Debt Age	0.072[c]	0.077[c]	0.073[c]	0.083[c]	0.061[c]
	(7.39)	(7.63)	(7.50)	(7.54)	(5.27)
TA Constraint	-0.097[c]	-0.095[c]	-0.092[c]		-0.110[c]
	(-4.66)	(-4.49)	(-4.35)		(-4.50)
Institutional Ownership	-0.180[c]	-0.177[c]	-0.174[c]	-0.288[c]	-0.176[c]
	(-3.36)	(-3.18)	(-3.20)	(-2.68)	(-2.59)
R-Squared	0.770	0.766	0.771	0.558	0.763
Observations	4,614	4,416	4,614	4,614	2,109

Note: This table provides estimated coefficients from regressing the log of corporate yield spreads (or the difference between the weighted average yield on the firm's outstanding debt and the yield on a treasure security with a similar duration) on the golden parachute and various control variables. The data covers the period from 1990 to 2006. Variable definitions are provided in Table 1. Year and 2-digit SIC code dummies are included in all regressions. T-statistics from White heteroskedastic-consistent standard errors adjusted for clustering by firm are included in parentheses. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Panel B. Alternative specifications

	Investment Grade	Non-Invest. Grade	Predicted Takeover	Board Structure	CEO Compensation
	(1)	(2)	(3)	(4)	(5)
Golden Parachute	0.063[c]	0.132[c]	0.131[c]	0.108[c]	0.114[c]
	(2.77)	(3.94)	(4.96)	(4.90)	(4.78)
EIndex – GP	0.019[a]	0.033[b]	0.016	0.019[b]	0.018[a]
	(1.94)	(2.34)	(1.61)	(2.00)	(1.79)
Firm Size	-0.067[c]	-0.013	-0.052[c]	-0.043[c]	0.006
	(-5.59)	(-0.72)	(-4.02)	(-3.21)	(0.38)
Leverage	0.284[c]	0.490[c]	0.362[c]	0.337[c]	0.304[c]
	(2.87)	(4.86)	(4.48)	(4.39)	(3.14)
Profitability	-0.799[c]	-1.581[c]	-0.929[c]	-1.220[c]	-0.906[c]
	(-3.22)	(-5.96)	(-4.35)	(-6.14)	(-4.03)
Sales Growth	-0.168[c]	-0.075	-0.163[c]	-0.188[c]	-0.179[c]
	(-3.85)	(-1.23)	(-4.12)	(-4.64)	(-3.72)
Volatility	0.144[c]	0.241[c]	0.256[c]	0.250[c]	0.288[c]
	(3.54)	(3.09)	(5.32)	(5.31)	(7.04)
Credit Rating	-0.090[c]	-0.111[c]	-0.133[c]	-0.133[c]	-0.138[c]
	(-14.54)	(-8.99)	(-25.72)	(-26.55)	(-24.67)
Market to Book	-0.054[c]	-0.087[b]	-0.048[c]	-0.035[b]	-0.008
	(-3.39)	(-2.34)	(-2.70)	(-2.11)	(-0.42)
Debt Duration	0.068[c]	-0.079[b]	0.030[b]	0.050[c]	0.047[b]
	(4.47)	(-2.40)	(1.99)	(3.37)	(2.46)
Debt Convexity	-0.133[b]	0.216	-0.007	-0.073	-0.075
	(-2.10)	(1.23)	(-0.12)	(-1.10)	(-0.87)
Debt Age	0.103[c]	-0.010	0.080[c]	0.065[c]	0.070[c]
	(9.53)	(-0.55)	(7.72)	(5.91)	(5.60)
TA Constraint	-0.048[b]	-0.109[c]	-0.105[c]	-0.100[c]	-0.060[b]
	(-2.06)	(-3.38)	(-4.10)	(-4.42)	(-2.35)
Institutional Ownership	-0.007	-0.228[c]	-0.176[c]	-0.222[c]	-0.049
	(-0.11)	(-2.95)	(-2.96)	(-3.45)	(-0.70)
Predicted Takeover			-0.672		
			(-0.98)		
Board Size				-0.008[a]	
				(-1.82)	
Outside Ratio				0.018	
				(0.32)	
PPS					-0.044[c]
					(-3.49)
Vega					-0.032[b]
					(-2.26)
R-Squared	0.639	0.641	0.760	0.775	0.769
Observations	2,965	1,649	4,197	3,469	2,721

Note: This table provides estimated coefficients from regressing the log of corporate yield spreads (or the difference between the weighted average yield on the firm's outstanding debt and the yield on a treasure security with a similar duration) on the golden parachute and various control variables. The data covers the period from 1990 to 2006. Variable definitions are provided in Table 1. Year and 2-digit SIC code dummies are included in all regressions. T-statistics from White heteroskedastic-consistent standard errors adjusted for clustering by firm are included in parentheses. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4. Golden Parachutes and the Cost of Debt - Difference in Difference Estimation

Panel A: Descriptive statistics (before tax regulation)

	Golden Parachutes (n=512)			Non-Golden Parachutes (n=126)			
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	Mean-Test (p-value)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Yield Spread	325.33	230.63	324.17	245.14	161.10	283.28	0.011[c]
Total Asset	8,789.10	4,661.24	10,013.9	10,625.6	6,875.25	11,197.8	0.072[a]
Leverage	0.528	0.513	0.133	0.453	0.442	0.146	0.000[c]
Market-to-Book	1.477	1.254	0.748	1.855	1.513	1.046	0.000[c]
Profitability	0.129	0.123	0.067	0.145	0.143	0.065	0.019[b]
Volatility	0.375	0.295	0.277	0.394	0.292	0.357	0.509

Note: This panel provides descriptive statistics for the treatment and control firms before the 2004 tax regulation. The date covers the period from 2001 to 2003. Variables are provided in Table 1. Firms with golden parachutes are treatment firms and firms without golden parachutes are control firms. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Panel B: Regression specifications

	2003-04	2003-04	2001-06	2001-06	2001-06	2001-06
	(1)	(2)	(3)	(4)	(5)	(6)
Golden Parachute	0.208[c]		0.192[c]		0.222[c]	
	(3.61)		(4.19)		(4.15)	
GP * Tax Rule	-0.099[a]	-0.111[a]	-0.161[c]	-0.147[b]		
	(-1.72)	(-1.91)	(-3.05)	(-2.52)		
GP * Year 2003					-0.082	-0.048
					(-1.24)	(-0.77)
GP * Year2004					-0.185[b]	-0.168[a]
					(-2.18)	(-1.92)
GP * Year 2005					-0.175[b]	-0.143[a]
					(-2.48)	(-1.88)
GP * Year 2006					-0.212[c]	-0.186[c]
					(-2.98)	(-2.61)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes
Debt Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	No	Yes	No	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Years Effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	353	353	283	283	283	283
Observations	629	629	1,249	1,249	1,249	1,249
R-Squared	0.79	0.446	0.802	0.625	0.802	0.625

Note: This panel provides regression results using the difference-in-difference methodology. Tax rule is a dummy variable that equals 1 if the year is greater than 2003. The variables Year 2003, Year 2004, Year 2005, and Year 2006 are dummy variables that equal 1 if the Year is 2003, 2004, 2005, and 2006, respectively. Variables definitions are provided in Table 1. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Panel C: Falsification specifications

	2002-03	2002-03	2001-02	2001-02	2000-01	2000-01
	(1)	(2)	(3)	(4)	(5)	(6)
GP	0.053		0.149[b]		0.144[b]	
	(0.47)		(2.13)		(2.00)	
GP * Tax Rule	0.054	0.014	0.070	0.079	0.036	0.014
	(0.43)	(0.12)	(0.91)	(1.03)	(0.42)	(0.22)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes
Debt Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	No	Yes	No	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Years Effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	290	290	295	295	266	266
Observations	532	532	534	534	478	478
R-squared	0.855	0.634	0.835	0.315	0.769	0.253

Note: This panel provides regression results using the difference-in-difference methodology. Tax rule is a dummy variable that equals 1 if the year is greater than 2003. Variables definitions are provided in Table 1. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Golden Parachutes and Firm Risk

	Idiosyncratic Risk				Total Risk			
	Primary Specification	Attempt=0	CEO Not Leaving Firm	Attempt=0 & CEO Not Leaving Firm	Primary Specification	Attempt=0	CEO Not Leaving Firm	Attempt=0 & CEO Not Leaving Firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Add GP	0.092[c]	0.094[c]	0.112[c]	0.099[b]	0.087[c]	0.090[c]	0.106[c]	0.094[c]
	(2.74)	(2.68)	(2.91)	(2.53)	(2.74)	(2.71)	(2.94)	(2.56)
$(EIndex - GP)_t$	-0.030[c]	-0.032[c]	-0.032[c]	-0.030[c]	-0.026[c]	-0.028[c]	-0.029[c]	-0.027[c]
	(-4.48)	(-4.70)	(-3.88)	(-3.65)	(-4.23)	(-4.44)	(-3.80)	(-3.54)
$Idiosyncratic\ Risk_{t-1}$	0.510[c]	0.503[c]	0.457[c]	0.453[c]				
	(35.83)	(34.82)	(25.46)	(25.55)				
$Total\ Risk_{t-1}$					0.536[c]	0.529[c]	0.482[c]	0.477[c]
					(39.74)	(38.75)	(27.84)	(28.01)
$Market\ to\ Book_{t-1}$	-0.001	0.004	0.014[a]	0.014[a]	0.006	0.010[a]	0.020[c]	0.020[c]
	(-0.11)	(0.58)	(1.73)	(1.76)	(0.95)	(1.62)	(2.61)	(2.64)
$Firm\ Size_{t-1}$	-0.113[c]	-0.113[c]	-0.112[c]	-0.112[c]	-0.095[c]	-0.095[c]	-0.094[c]	-0.094[c]
	(-17.03)	(-16.72)	(-14.18)	(-14.24)	(-16.25)	(-15.97)	(-13.17)	(-13.19)
$Leverage_{t-1}$	0.427[c]	0.401[c]	0.327[c]	0.311[c]	0.395[c]	0.370[c]	0.286[c]	0.270[c]
	(8.70)	(7.91)	(5.27)	(5.04)	(8.54)	(7.74)	(4.86)	(4.62)
Observations	16,845	15,895	11,672	11,408	16,849	15,899	11,673	11,409
R-Squared	0.517	0.516	0.504	0.503	0.539	0.538	0.529	0.528

Note: This table provides OLS regressions on firm volatility. The dataset covers the period from 1990 to 2006. The dependent variable is natural logarithm of the annualized variance of the residuals from the market model (Idiosyncratic Risk) or the natural logarithm of the annualized variance of daily returns (Total Risk). Variable definitions are included in Table1. Year and 2-digit SIC code dummies are included in all regressions. T-statistics from White heteroskedastic-consistent standard errors adjusted for clustering by firm are included in parentheses. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.

Table 6. Operating Performance

Year	ROA Before Depreciation (ROA1)	Obs.	ROA After Depreciation (ROA2)	Obs.	Ind. Adj. Sales Growth	Obs.
	(1)		(2)		(3)	
1991	-0.646	1,025	-0.473	1,029	-1.529[a]	1,027
1992	-0.421	1,008	-0.261	1,013	-1.355	1,012
1993	-0.234	959	-0.158	963	-0.851	962
1994	-0.593	1,041	-0.661	1,044	-0.221	1,043
1995	0.097	989	-0.105	991	-0.739	990
1996	-0.121	1,068	-0.514	1,069	-1.393	1,068
1997	-0.172	1,000	-0.296	1,006	-0.837	1,006
1998	-0.508	863	-0.542	869	-0.577	870
1999	-1.165[a]	1,224	-1.134[a]	1,227	-2.277[a]	1,227
2000	-0.613	1,094	-0.618	1,098	0.559	1,097
2001	-1.196	1,134	-1.000	1,139	-0.976	1,137
2002	-1.403[b]	1,080	-1.389[a]	1,083	-4.725[c]	1,081
2003	-0.093	1,385	0.013	1,388	-1.060	1,385
2004	0.446	1,266	0.559	1,266	1.105	1,265
2005	-0.708	1,345	-0.624	1,347	-0.98	1,346
2006	-0.106	1,174	0.209	1,175	0.073	1,173
Mean	-0.465[c]		-0.437[c]		-0.986[c]	
Std. Deviation	0.137		0.131		0.309	
T-Statistics	(-3.39)		(-3.34)		(-3.19)	

Note. This table provides results from regressing the lagged golden parachute variable on the median industry-adjusted ROA and Sales Growth. ROA is the ratio of operating income scaled by total assets. We measure operating income in two ways: before and after depreciation (ROA1 and ROA2). Sales Growth is annual sale growth in the firm's total revenue. Control variables include entrenchment index less golden parachutes, log of book-to-market equity, and log of market value of equity. All control variables are lagged one year. We use the Newey-West procedure with one lag to adjust for serial correlation and compute the time-series mean of coefficients and standard deviation and *t*-statistics for the average of the coefficients. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively. For ease of exposition, all coefficients are multiplied by 100.

Table 7. Golden Parachutes and CEO Turnover

	CEO Leaves Firm		CEO Leaves Office	
	Primary Specification	Attempt=0	Primary Specification	Attempt=0
	(1)	(2)	(3)	(4)
Golden Parachute$_{t-1}$	0.112[b]	0.111[b]	0.077[b]	0.078[b]
	(2.33)	(2.27)	(2.05)	(2.07)
	[0.009]	**[0.009]**	**[0.011]**	**[0.011]**
(EIndex – GP)$_{t-1}$	0.043[b]	0.050[b]	0.023	0.023
	(2.16)	(2.43)	(1.46)	(1.45)
Firm Size$_{t-1}$	0.001	0.000	0.039[c]	0.041[c]
	(0.08)	(-0.06)	(3.02)	(3.22)
Leverage$_{t-1}$	0.278[b]	0.301[b]	0.149	0.147
	(1.97)	(2.10)	(1.36)	(1.32)
Market to Book$_{t-1}$	-0.053[b]	-0.045[b]	-0.014	-0.012
	(-2.29)	(-1.97)	(-0.92)	(-0.78)
Stock Return$_{t-1}$	-3.758[c]	-3.717[c]	-2.569[c]	-2.541[c]
	(-5.86)	(-5.64)	(-4.77)	(-4.62)
(CEO Age > 65)$_t$	0.458[c]	0.483[c]	0.711[c]	0.733[c]
	(6.70)	(6.97)	(13.65)	(13.88)
Inst-Own$_{t-1}$	0.182	0.258[a]	0.167[a]	0.214[b]
	(1.42)	(1.92)	(1.74)	(2.19)
Pseudo R-Squared	0.057	0.061	0.057	0.060
Observations	10,545	10,297	10,742	10,490

Note: This table provides probit regressions on the likelihood of CEO turnover. The dataset covers the period from 1990 to 2006. The dependent variable in Columns 1-3 is dummy variable that equals one if a CEO left the firm, and for Columns 4-6 if a CEO left the office. Variable definitions are provided in Table1. Lagged rolling mean monthly abnormal stock return over the 12 months (Stock Returns$_{t-1}$).. Year and 2-digit SIC code dummies are included in all regressions. T-statistics from White heteroskedastic-consistent standard errors adjusted for clustering by firm are included in parentheses. The marginal effects of golden parachutes on the probability of CEO turnover are provided in bold square brackets. The notations [a],[b],[c] denote significance at the 10%, 5%, and 1% levels, respectively.