

How costly is corporate bankruptcy for top executives?

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Abstract

High expected personal costs may cause risk-averse executives to hedge against default by reducing corporate leverage and perhaps under-invest in risky corporate projects, resulting in a potentially important form of agency costs of debt. To address this issue, we provide estimates of CEO human capital losses from corporate bankruptcy which, for the first time, account for CEO post-bankruptcy employment. Fully half of the incumbent CEOs maintain full-time executive employment with a median estimated labor income loss of zero. Thus, these CEO's labor market reputations do not seem to have been tainted by the bankruptcy event. However, the other half—CEOs who fail to maintain executive employment—experience a median loss equal to five times their pre-departure labor income. Executives with greater *predicted* income loss are more likely to be forced out, suggesting that these managers were earning supra-competitive rents. The proportion equity pay in the CEO's compensation package is decreasing in the predicted income loss, similar to a labor-contract hedge. Finally, greater stock ownership lowers the probability that the CEO leaves the distressed firm voluntarily.

1 Introduction

Corporate bankruptcy imposes economic and emotional hardship on employees. Sources of economic costs range from employee retraining and relocation expenses to loss of future employment income (human capital) and equity investment value in the bankrupt firm. While personal bankruptcy costs are relevant for the wage-contracting process generally, the costs incurred by the firm’s top executives are of particular interest to corporate finance. High expected personal costs may cause risk-averse executives to hedge against default by reducing corporate leverage and perhaps under-invest in risky corporate projects—resulting in a potentially important form of agency costs of debt (Eckbo and Thorburn, 2003; Berk, Stanton, and Zechner, 2010).

The extent to which shareholders are able to mitigate such agency costs of debt, through contractual risk-sharing arrangements and governance mechanisms, is largely unknown. One reason is lack of systematic information on the magnitude and determinants of top executives’ personal costs of corporate bankruptcy. The leading U.S. evidence on this issue is in Gilson (1989) and Gilson and Vetsuypens (1993), who study bankruptcy-induced executive compensation and turnover during the early years of Chapter 11. The main purpose of our paper is to substantially modernize and expand our knowledge of the size and determinants of executives’ bankruptcy-induced changes in human capital, and to cover the more recent market-oriented era of Chapter 11 proceedings.¹

We make four distinct empirical contributions. The first is to integrate into the managerial personal bankruptcy cost analysis unique information on top executives’ post-turnover employment. Data on post-turnover employment has historically been hard to come by in the U.S., and has therefore largely been missing in the broader literature on executive turnover and compensation. To our knowledge, the only other study which systematically tracks CEO employment income changes following turnover in distressed firms is Eckbo and Thorburn (2003), who examine bankruptcy auctions in Sweden. Absent such data, the U.S. literature has assumed a labor income stream of zero from the year the CEO leaves the firm and until retirement age. As we show below, this key assumption produces a significant upward bias in managerial personal bankruptcy cost estimates.²

¹Chapter 11 was adopted in 1978. Early proceedings were drawn-out, imposing significant costs on the bankrupt firms (Baird, 1986; Jensen, 1989; Bradley and Rosenzweig, 1992). The past two decades have seen a marked increase in creditor activism during the Chapter 11 restructuring process, in part designed to lower corporate bankruptcy costs (Baird and Rasmussen, 2002; Ayotte and Morrison, 2009; Jiang, Li, and Wang, 2012). See Hotchkiss, John, Mooradian, and Thorburn (2008) for a comprehensive review.

²For recent surveys on CEO compensation, see e.g. Aggarwal (2008) and Frydman and Jenter (2010).

The labor market response to the bankruptcy filing event is likely to be complex. On the one hand, the executive may be tainted by the failure to resolve what turned out to be an inefficient capital structure in time to avoid formal bankruptcy filing. On the other hand, going through severe financial distress likely adds to the executive’s skill set. There is an extensive U.S. leadership literature covering both business and military training that emphasizes the value of experience with actual or simulated crisis situations. In our context, the existence of restructuring specialists—accounting for 28% of the replacement CEOs in our sample—also suggests that this experience has market value (?). The net effect of these opposing labor market considerations for the change in CEO human capital is therefore an open empirical issue, which we address.

Having identified the executive’s new employment, we either observe directly the compensation at his new job (using both ExecuComp and SEC proxy filings), or we provide an estimate. In the estimation, we use the contemporaneous executive pay recorded for a public company matched on size and industry to the new firm. If the new employment is in a private company, this observed public-company compensation is reduced using the private-firm compensation discounts estimated in Gao, Lemmon, and Li (2011). With this procedure, we are confident that the new employment income estimate is zero only if there *is* no new employment.

To estimate the total loss of CEO labor market rents, we compute the present value of the executive’s income change until a retirement age of 65, accounting for any severance pay. We are particularly interested in the present value income change of the *incumbent* CEO—defined here as the CEO in place three years prior to filing or one that was promoted to the CEO position from inside the firm prior to the year of bankruptcy filing. The remaining sample CEOs—hired in the year of bankruptcy filing through the year of bankruptcy resolution, or hired from the outside prior to filing—are labeled “turnaround CEOs”. As the label suggests, these replacement CEOs are brought in to lead the firm through the restructuring process.

Having run the company for a substantial period of time leading up to bankruptcy filing, our incumbent CEOs are likely viewed by the labor market as the executives primarily responsible for the failure to restructure the firm outside of formal bankruptcy. If this failure taints the reputation of the sitting CEOs more than the value-added of having gained crisis experience, we expect their external job opportunities to suffer as a consequence. Interestingly, we find that as much as half of the incumbent CEOs are able to either stay on as CEO of the restructured firm or to assume

full-time executive employment elsewhere. This finding provides an important correction to the standard assumption of zero new employment in the extant literature.

Even more striking, we find that *the median estimated loss of employment rents of re-employed CEOs is statistically indistinguishable from zero*. This is in contrast to CEOs who fail to find new executive employment: they experience a median estimated loss of labor market rents with a present value equal to five times the pre-departure income level (the median present value rent loss is \$4.2 million in constant 2009 dollars). Across all sample CEOs, the median ratio of present value loss to pre-departure income is 2.7. This ratio is significantly lower than the ratio of six to one implied by the information in Table 6 of Gilson (1989) who study Chapter 11 filings up through 1984.

Our second contribution is to estimate a cross-sectional model for the loss of CEO labor market rents (conditional on bankruptcy filing), which we use to form a *predicted* loss of rents for each sample CEO. We then ask whether the predicted loss of rents systematically affects (1) the CEO's decision to leave the bankrupt firm and (2) the proportion of the CEOs' total compensation paid in cash. The latter question addresses whether personal CEO bankruptcy costs give rise to *ex ante* contractual risk-sharing between shareholders and executives.

We find that the cash proportion of the total compensation is increasing in the predicted CEO income loss. This is consistent with labor contracts providing at least a partial hedge against CEO equity losses from corporate bankruptcy. We also find that greater predicted CEO rent loss from bankruptcy increases the probability of forced turnover, suggesting that some low quality managers stay with the distressed firm in an attempt to keep extracting labor market rents, until forced out (in some cases by creditors, as discussed below).

Our third contribution is to provide information on the magnitude of incumbent CEOs' loss of equity value in the bankrupt firm, and on how firms emerging from Chapter 11 restore incentives for its top executives by increasing the proportion equity-based pay and. At year-end prior to the year of bankruptcy filing, the median incumbent CEO's shareholding is 2.1%, with a market value of \$2 million. While we do not have intra-year data on CEO equity trades, this value is most likely lost as it is difficult for insiders to sell out right before bankruptcy filing without violating insider trading restrictions.

As expected, going backward in event time from the filing year increases the value of the

incumbent CEO's equity holdings. The median year-end equity value is \$6 million two years prior to filing (of which \$1 million is the value of unexercised options). The median equity ownership is 2.1% also in year -2 so the median executive does not reduce his stock ownership over the two years prior to filing. Interestingly, greater CEO percentage share-ownership lowers the probability that the CEO leaves the firm voluntarily, suggesting that equity holdings provide an incentive to stay with the firm in an attempt to halt the slide towards bankruptcy. We are unaware of any other study documenting this positive incentive effect of equity-based investment.

Our fourth and final contribution is to analyze whether creditor control rights tend to impact the probability of forced CEO departure. As is well known, over the past two decades, creditors have substantially increased their influence over Chapter 11 proceedings through actions like prepackaged bankruptcy filings, debtor-in-possession (DIP) financing arrangements, and hedge-fund investments in distressed debt. Debtors and creditors may well disagree about whether or not to retain the incumbent executive. For example, secured creditors may view a particular CEO as too willing to implement shareholder-friendly risk-shifting strategies (Jensen and Meckling, 1976). Or, unsecured creditors may seek to preserve supplier relationships developed by the firm's existing top executive, while shareholders may view these relationships as unimportant close to bankruptcy filing.³

We define creditor control rights using the firm's pre-filing debt structure (proportion of bonds and trade credits), and whether pre-petition lenders provide DIP financing. DIP financing is particularly effective as it allows the creditor to write control-right provisions directly into the DIP contract. Our data confirms that the presence of pre-petition lender DIP financing is associated with higher probability of forced CEO turnover. The cross-sectional analysis also shows that forced CEO turnover is *less* likely when a large fraction of the firm's liabilities are trade credits and when institutional owners hold more than one-quarter of the firm's equity.

The rest of the paper is organized as follows. Section 2 describes the sample selection procedure and CEO turnover statistics. Our sample consists of 342 large public U.S. companies that filed for Chapter 11 between 1996 and 2007, and where the case was resolved before 2011. Section 3 provides information on CEO compensation policies of the sample firms, relative to both industry matches

³Two examples of creditors exercising control rights over the CEO: When Hancock Fabrics Inc. filed for Chapter 11 in 2007, the company's suppliers formed an unsecured creditor committee and made sure the pre-filing CEO Jane Aggers stayed on through bankruptcy and after the firm emerged. In Recotron's 2003 filing, senior creditors replaced the old CEO with Jerry Kalov, a new CEO from the outside, and provided DIP financing with a covenant stating that removal of Kalov would be considered a default event on the DIP facility.

and incoming CEOs. In Section 4, we track the new jobs of executives departing our bankrupt firms, starting two years prior to bankruptcy filing and ending one year after the restructured firm emerges from Chapter 11 (or until liquidation or acquisition in bankruptcy). This section also provides our estimates of the CEO income change and loss of labor market rents. In Section 5 we build a cross-sectional regression model for CEO bankruptcy costs and use the predicted values of this model to explain forced and voluntary CEO turnover and the compensation package at the distressed firm. Section 6 describes CEO equity losses prior to bankruptcy filing, while Section 7 concludes the paper. The Appendix contains a description of variables and some additional empirical results on compensation changes.

2 CEO turnover at distressed firms

2.1 Sample selection

Our sample selection starts with the 497 Chapter 11 bankruptcy filings by US public firms with book assets above \$100 million (in constant 1980 dollars), from the period 1996-2007, found in the Bankruptcy Research Database of Professor Lynn LoPucki at UCLA Law School. We require that the bankruptcy be resolved by 2011 (through liquidation, acquisition or emergence from Chapter 11), which eliminates 18 dismissed or pending cases. A further 137 cases are eliminated due to unavailability of CEO personal characteristics and compensation information in the fiscal year prior to filing, yielding a final sample of 342 filing firms.

The required CEO data includes name, chairmanship, age, tenure, stock ownership, and annual total compensation. This information is obtained from ExecuComp or collected manually from SEC filings (proxy statements and 10-K forms) through Edgar.⁴ We follow each sample firm starting three fiscal years prior to the year of filing (event year 0) and through the fiscal year after the year of bankruptcy resolution (event year Emergence+1), or until liquidation or acquisition in bankruptcy. Counting from year -2, we have a total of 1,674 firm-year observations in our sample.

Table 1 shows the annual distribution of our Chapter 11 filings. More than half of the firms file

⁴ExecuComp covers S&P large cap 500, midcap 600 and small cap 400 firms. When the stock price declines as the firm approaches bankruptcy, many of the sample firms drop out of the S&P1500 index and ExecuComp stops its coverage. Moreover, most firms delist when they file for bankruptcy, in which case they are also dropped from ExecuComp. Note, however, that many firms continue to file with the SEC after bankruptcy filing even if they have delisted.

for bankruptcy in years 2000 to 2003. In the fiscal year prior to filing (year -1), the average filing firm has sales and assets of \$2.9 billion and \$3.3 billion, with a median of \$0.7 and \$0.8 billion, respectively. The bankruptcy proceedings last on average 17 months (median 13 months). 48% of the cases are resolved within 12 months of filing, and 78% are resolved within 24 months of filing. Thirty percent are prepackaged filings ("prepacks"), where the firm has negotiated a reorganization plan with its creditors prior to filing. Prepackaged bankruptcies are resolved quicker, with an average time in bankruptcy of 6 months (median 5 months). The filing firm emerges from Chapter 11 as an independent restructured company in 219 cases (64%), while 89 firms (26%) are acquired in bankruptcy, and another 34 firms (10%) are liquidated.⁵

2.2 CEO turnover statistics

CEO turnover is identified using information in ExecuComp, proxy statements, and 10-Ks. For companies that stop filing with the SEC after entering bankruptcy, we resort to bankruptcydata.com and Factiva to identify whether there is CEO turnover throughout the reorganization process. This produces information on the time of departure for all but five of the 640 sample CEOs (the five are all CEOs of firms acquired in Chapter 11). As shown in Table 2, over the event period -2 through Emergence+1, 462 of the 640 CEOs (72%) depart while the rest (28%) remain as CEOs with the bankrupt firm. The average CEO is 55 years old when leaving the firm and has served as CEO for a period of six years.

Panel A of Table 2 shows the entry and departure of the sample CEOs by year relative to bankruptcy filing. One-third (149) of the departing CEOs leave prior to bankruptcy filing, another 267 (58%) leave during bankruptcy, while the remaining 46 (10%) depart in the year after emergence from Chapter 11. The average annual turnover is 28%. The CEO turnover rate is highest when the firm is restructuring in bankruptcy, where 35% of the CEOs are replaced in an average year. In the years prior to filing and after emergence, the average turnover rate is 22% and 21%, respectively.⁶

⁵The sample firms are distributed across a large number of two-digit SIC industries. The four industries with the highest representation are communications, business services, primary metals, and health services.

⁶The 28% annual average CEO turnover rate is comparable to that reported elsewhere for firms in financial distress (Ayotte and Morrison, 2009; Evans, Nagarajan, and Schloetzer, 2010; Jiang, Li, and Wang, 2012), and it is significantly higher than for solvent firms (Huson, Malatesta, and Parrino, 2004; Perez-Gonzales, 2006; Jenter and Kanaan, 2010).

2.2.1 Incumbents versus turnaround CEOs

We define incumbent CEOs as executives at the helm of the filing firm at the end of year -3 relative to the fiscal year of bankruptcy filing, or promoted internally to the CEO position during years -2 or -1 (replacing a previous incumbent). With this definition, there are a total of 408 incumbent CEOs: 338 in place at the end of year -3 and 70 promoted internally before year 0 (30 in year -2 and 40 in year -1).

In addition to the 408 incumbent CEOs, there are 232 sample CEOs which we label “turnaround CEOs”. Turnaround CEOs are defined as CEOs hired from the outside in year -2 or -1 and all CEOs hired in the year of bankruptcy filing through resolution. We use the label turnaround CEO to separate these hires from the incumbents, who to greater degree are held responsible for the bankruptcy filing.

To be absolutely sure that our turnaround CEOs are not held responsible for the slide towards bankruptcy, we would have to restrict the definition of turnaround CEOs to hires in year 0 and later. However, filing firms are struggling with severe financial distress in also year -1, and many even in year -2. This is evident in our data: the median leverage ratio and industry-adjusted ROA for the sample firms are, respectively, 82% and -3.5% in year -2, and 95% and -5.8% in year -1. Hence, we posit that all outside hires from year -2 are aware of the distress and hired to fix it. As shown in Panel A of Table 2, of the 232 turnaround CEOs, 83 are hired before bankruptcy filing (36 in year -2 and 47 in year -1) and another 149 during bankruptcy. Public sources describe 63 of the turnaround CEOs as actual restructuring specialists and 123 have prior CEO experience.

Of the 408 incumbent CEOs, 338 (83%) depart during the sample period. Of these, 139 leave prior to filing, 172 leave during bankruptcy and 27 leave in the year after emergence. Thus, one year after emergence, only 70 incumbents (17%) remain at the helm of the restructured firm.⁷ There are 124 departing turnaround CEOs, of which three-quarters leave during bankruptcy.

⁷This 17% retention rate is somewhat lower than the 29% reported by Gilson (1989) for an event period that stops two years after filing. Betker (1995) reports that 25% of CEOs in office two years prior to the first debt default are still in place when the firm emerges from bankruptcy.

2.2.2 Forced versus voluntary departure

Panel A of Table 2 also reports CEO departures classified as forced versus voluntary. Our definition of forced follows the extant turnover literature (Huson, Parrino, and Starks, 2001; Yermack, 2006). The departure is defined as forced if, according to public sources, (1) the turnover is performance-related or follows pressure by the board, shareholders or creditors; or (2) the CEO resigns for personal reasons, to pursue other interests or, if no reason is given, the CEO is not employed by another company within a year; or (3) the firm is liquidated or acquired in bankruptcy and the departing CEO is less than 60 years old. All other departures are classified as voluntary. A total of 52% (238) of all CEO departures are classified as forced.⁸

Panel B of Table 2 lists the stated reason for CEO turnover. After an extensive search for turnover-related information (using Factiva, 10-Ks and proxy statements), we are able to identify a stated reason for the turnover for as many as 90% of the sample CEOs. The classifications are similar to those used by Gilson (1989) and Denis and Denis (1995). The classifications are, in decreasing order, resigned for personal reasons (99 cases or 21%), liquidation or acquisition in bankruptcy (19%), retirement or normal succession (15%), pressured to leave by the board, shareholders, or creditors (13%), leave to pursue other interests (11%), and leave for performance-related reasons (4%). Another 28 CEOs (6%) leave for a variety of other reasons, including finish restructuring the company, finish a transition period, return to own company, investigation or inquiry by a special committee, etc. Two CEOs leave their position due to illness or death.

Panel B also lists the number and percentage of CEO departures in each category that are forced and by incumbents/turnaround CEOs. Almost half of the departures in the categories resigned for personal reasons and to pursue other interests are forced.⁹ Incumbents make up 92% of the cases classified as retirement or normal succession, 90% of the cases classified as pressured by the firm's stakeholders, and 82% of the cases classified as performance related. In contrast, a majority (59%)

⁸This rate of forced turnover is lower than that reported by Gilson (1989). Gilson (1989) classifies a departure as forced also if the CEO leaves for personal reasons, or if no reason is given and the CEO is over 60 years old, both of which the broader turnover literature now treats as voluntary departures. The 52% forced turnover rate is also substantially higher than reported by studies of non-distressed firms that use a similar classification. For example, the rate of forced turnover is 13% in Parrino (1997), 16% in Huson, Parrino, and Starks (2001), and 24% in Jenter and Kanaan (2010). Apparently, the dramatic corporate control changes which occur in bankruptcy lead to a much higher rate of forced CEO turnover than the case is for non-distressed firms.

⁹Among the CEOs who leave without any reason given, 55% are classified as forced because they fail to find new employment within one year.

of the CEOs leaving for other reasons are turnaround CEOs.

2.3 Determinants of turnover timing

What decides the CEO turnover timing, i.e., whether an incumbent CEO stays around to take the firm through restructuring or leaves? Table 3 shows cross-sectional regressions for the determinants of incumbent CEO turnover, estimated using both binomial and multinomial logit. The sample is 368 incumbent CEOs with a full set of control variables. In Model (1), the dependent variable equals one when the incumbent CEO leaves prior to bankruptcy filing (in year -2 or -1) vs. is in place in the year of filing. In the multinomial Model (2), we estimate the probability of voluntary versus forced turnover prior to filing, where the third outcome again is that the CEO is in place in year 0. Appendix Table 1 gives the full set of variable definitions.

The first set of explanatory variables captures personal characteristics of the CEO in the year prior to bankruptcy filing (for CEOs departing in year -1 and -2, we use characteristics from year -2 and -3, respectively). *Age* and *Tenure* represent the CEO's age and tenure with the filing firm (in years). *Chairman* is a dummy variable indicating that the CEO is Chairman of the board, and *Ownpct* measures the percent shares owned by the CEO.

The estimated probability that the incumbent CEO departs prior to bankruptcy increases with CEO age and decreases with the percent share ownership. More specifically, age is positively related to voluntary turnover, while CEO share ownership is negatively associated with both voluntary and forced turnover. The latter finding is particularly interesting as it indicates that a large equity stake provides strong incentives to stay with the firm, perhaps in an attempt to turn around the firm. We are unaware of any other study which has shown this managerial incentive effect of equity ownership.

The models also contain firm characteristics from the fiscal year prior to filing, including *Size* (log of total sales) and *Tangibility* (the ratio of net property, plant and equipment to total assets). The variables *Industry adjusted ROA* and *Industry adjusted leverage* compare the sample firm with the median firm in its two-digit SIC industry, where *ROA* is EBITDA to total assets and *Leverage* is total liabilities to total assets.

The regressions further control for industry distress, *IndDistress*, a dummy taking the value of one if, as in Acharya, Bharath, and Srinivasan (2007), the median stock return for the two-digit

industry is below -30% in a given year. $Institution \geq 25\%$ is a dummy variable which takes the value of one if institutional investors, according to 13-F filings with the SEC, own more than 25% of the firm’s equity in a given year (the 25% threshold is the sample average fraction of institutional ownership in the fiscal year prior to Chapter 11 filing). All regressions control for industry fixed effects at the one digit SIC code level.

The only firm characteristic that shows any significance is $Institution \geq 25\%$, which has a weakly negative impact on the turnover probability. At first blush it may perhaps seem surprising that industry-adjusted profitability (ROA) does not receive a significant coefficient. However, recall that, in this specification, we are estimating determinants of the *timing* of the turnover (before or after bankruptcy filing)—not the probability of turnover versus no turnover. As one would expect, we show later (in Table 9) that industry-adjusted profitability does affect the latter probability.

The last column in Table 3 shows the coefficient estimates from a logit estimation of the probability that the incumbent CEO retains his position with the filing firm through bankruptcy versus departs prior to year-end Emergence+1. The sample and explanatory variables are the same as before. Again, few variables produce a significant coefficient. The one exception is *Age*, which enters with a negative sign (significant at the 5%-level). That is, younger CEOs are more likely to stay with the firm through bankruptcy and continue at the helm after emergence. Overall, the probability that a CEO leaves the distressed firm early is higher the older the executive and the smaller the CEO stock ownership in the firm.

3 CEO compensation at distressed firms

3.1 Incumbent versus industry matching CEOs

We record compensation data using ExecuComp, 10-Ks and proxy statements. All components of total compensation are included: salary, bonus, long-term incentive plans (LTIP), value of restricted stock awards, number of options granted, exercise price, grant date, maturity date, and value of grant.¹⁰ Cash pay is defined as the sum of salary, bonus, and LTIP.¹¹ Equity grants are defined as

¹⁰Due to the adoption of FAS123, companies report option and stock awards in a slightly different form after 2005. For years 2006-2009, we rely on ExecuComp tables “Plan Based Awards” and “Outstanding Equity Awards” to calculate the value of options awarded.

¹¹We exclude “all other cash compensation” since it often includes severance pay or other discretionary payments.

the total value of all restricted stock and options granted in that year, valued at the year-end stock price and using the Black-Scholes model.¹² Total pay is the sum of cash pay and equity grants. All compensation numbers are in constant 2009 dollars.

Figure 1 plots the yearly median total compensation in \$ thousands (1A) and in the form of a median total pay index (1B). The plot is for incumbent CEOs and for CEOs of non-distressed matching firms. The matching firms are from ExecuComp (excluding the sample firms). We require the matching firm to have the same two-digit industry code as the sample firm and be closest in sales.¹³ The number of incumbent CEOs drops off from 306 in year -3 to 93 in the year of bankruptcy filing. The figure excludes the period in bankruptcy since it varies in length across firms. In the year of emergence, the figure continues with a sample of 54 incumbent CEOs of successfully restructured firms with data on matching firms.

Starting in year -3 in Figure 1A, our incumbent CEOs have somewhat lower median compensation than the CEOs of matched firms (\$1.2 million vs. \$1.6 million), with the pay gap widening as the sample firms approach bankruptcy. In year 0, the median total income is down to \$0.9 million. In the year of emergence, the median CEO compensation is back up to \$1.2 million.¹⁴ In the year after emergence, the median CEO compensation is a significantly higher \$2.4 million. This compensation rebound is strikingly apparent also in Figure 1B which normalizes the income to 1 in year -3 for both samples. The compensation rebound shows that successfully restructured firms resume paying competitive compensation soon after emergence from bankruptcy, most likely to attract and retain high-quality executives.

While not shown in the graph, we also find that a relatively large fraction of the post-bankruptcy total pay is in stock and option grants. Equity grants typically constitute 38% of the total pay in year Emergence+1, compared to 20% equity grants in year -2. The equity proportion of our

¹²When the grant date is missing, it is assumed to be July 1st of that year. The expected stock return volatility is measured as the annualized standard deviation of daily stock returns over the fiscal year in which the grant was made. A firm must have 50 observations for its volatility to be estimated, or else we use the median of the volatility distribution of all firms in ExecuComp in a given year. Following the practice of ExecuComp, we replace the volatility with its 5th and 95th percentile, respectively, if it is either below the 5th percentile or above the 95th percentile of all observations in a given year. Expected dividend yield is the ratio of cash dividends paid in the fiscal year of the grant and the fiscal year-end stock price. The treasury bond yield corresponding to the option's expected time to maturity is used as the risk-free rate.

¹³For 20% of the sample firms, where the ratio of sales for the matched firm and the bankrupt firm is less than 0.70 or greater than 1.30, we select a matching firm at the one-digit industry level and closest in sales.

¹⁴There appears to be a slight decline in the median CEO total compensation in years -1 and 0 also for the matched firms, possibly reflecting an industry-wide performance decline around bankruptcy events (Lang and Stulz, 1992).

restructured companies are also higher than for the matched firms, which pay 30% of the total CEO compensation in equity grants in year Emergence+1. Thus, it appears that the restructured companies not only pay a competitive CEO total compensation but also structure the pay package using a relatively high proportion equity-based pay to restore their equity incentives.

3.2 Departing versus incoming CEOs

The pay-differences between outgoing and incoming CEOs are interesting as they reflect differences in things like labor market rents, CEO skills in terms of turning around a distressed firm, and CEO risk aversion. Moreover, the choice between promoting from the inside or hiring from the outside depends on organizational culture and the reallocation of internal control rights and fiduciary responsibilities as the firm approaches bankruptcy.

Table 4 presents univariate comparisons of the total compensation and the cash portion of pay for our incoming and outgoing CEOs. For incoming CEOs, the compensation data are from the year of hire, while for the outgoing CEO the data are from the fiscal year prior to leaving the firm (to avoid the confounding effect of partial-year compensation data when the CEOs leave before year-end). Panel A of the table lists results for internally promotions, while Panel B shows compensation for replacement CEOs hired externally.

Panel A shows that *internally* promoted CEOs are paid significantly *less* than their predecessors. The dollar values for the total sample imply that internally promoted CEO receives a mean total pay that is $100 \times (2,374 - 1,597) / 2,374 = 33\%$ less than what was earned by the outgoing CEO (the difference in median total pay is much smaller). Furthermore, the compensation difference between incoming and departing CEOs depend on whether the CEO replacement takes place before or during bankruptcy. When replaced before bankruptcy, the internally promoted CEO receives on average 39% less total compensation than the outgoing CEO, and 26% less when the replacement takes place during bankruptcy.

Notice also that the average total pay levels of the outgoing and internally promoted CEOs are lower in bankruptcy than before bankruptcy, perhaps reflecting a negative reputational effect on both executives of having failed to avoid bankruptcy filing. This decline in average total pay from before to during bankruptcy is 27% for the internally promoted and 40% for the outgoing CEO, respectively.

Panel A further shows that the proportion of the total compensation that is paid in cash is almost identical across departing and incoming CEOs, with an average of 71% for departing CEOs and 72% for incoming CEOs. Interestingly, for both departing and incoming CEOs, the mean portion of the total compensation that is paid in cash increases substantially from 64% before bankruptcy to more than 80% in bankruptcy, possibly reflecting a combination of stock illiquidity and the greater risk for the CEO of operating a bankrupt firm successfully.

In contrast to the case for internally promoted CEOs, Panel B shows that *externally hired* replacement CEOs are paid significantly *more* than the departing CEOs, with an average premium of $100 \times (3,803 - 2,621) / 2,621 = 45\%$. This premium is again greater when the replacement occurs before than during bankruptcy (64% versus 21%). Moreover, as for internally hired CEOs, the median pay differences are much smaller than the differences in mean.

The premium paid to external replacement CEOs in Panel B is comparable to the 34% premium reported by Gilson and Vetsuypens (1994) for 77 distressed firms prior to the 1990s. Custodio, Ferreira, and Matos (2012), who study the characteristics of CEOs of non-distressed firms among the S&P 1,500 companies during the period 1993-2007, also find that external hires are paid more than the outgoing CEOs.

Since the compensation difference between departing and incoming CEOs in Table 4 may be driven by differences in managerial quality and other personal characteristics, it represents a noisy estimate of the income loss suffered by the outgoing CEOs. To remove this cross-sectional variation, we now turn to a longitudinal estimation of the loss of CEO labor market rents around bankruptcy, following the individual CEO.

4 Estimating CEO loss of labor market rents

In this section, we first detail the CEOs' post-bankruptcy employment, and then estimate the new employment income. The difference between the old and new income, including severance pay (if any) for departing CEOs, is then used to measure CEO labor market rent loss until retirement.

4.1 Identifying departed CEOs' new employment

Recall from Table 2 that 462 of the 640 sample CEOs leave over the period -2 through Emergence+1. For these departed CEOs, we first determine whether the CEO stays as Chairman of the board, using proxy statements and 10-Ks for the fiscal year after turnover.¹⁵ We then search Standard and Poor's (S&P) Register of Corporations, Directors, and Executives, and Who's Who in Finance and Business for employment information.¹⁶

To increase coverage of private companies, we also search news and press releases through Factiva, LinkedIn and Wikipedia, and we do direct Google searches. As it turns out, a majority of the post-turnover employment information is obtained through these less traditional searches of social media and the internet. We follow the CEO's status for three years after departure, recording the starting year and month for any new employment. Conditional on finding new employment, it takes on average one year before a departed CEO joins a new firm.

Table 5 shows the frequency distribution of the 462 departed CEOs across different categories of subsequent employment. About half of the departing CEOs (220 of 462 or 48%) find new full-time executive employment or stay as Chairman of the board of the restructured firm. Of these, 33 executives stay as Chairman, 97 become CEO at another firm and 90 become a non-CEO executive. Interestingly, one out of six departed CEOs joins another *public* firm. This is in contrast to earlier evidence, such as Gilson (1989), who reports that none of the departed CEOs find a new executive position in a public company.

The remaining 242 departed CEOs fail to find new full-time executive employment. Of these, 19 become consultants or politicians, 26 become self-employed and 197 find no new employment. The 197 who find no new employment include 46 CEOs that retain an honorary position with the restructured firm, 29 that retire, 22 that find no new job within three years of departure, 11 who end up in prison or under investigation, three that die, one that pursues an academic degree, and 85 who cannot be found in any of our data sources.

¹⁵We classify a CEO as chairman if references to his title include the word "chairman" but does not include the words "former chairman", "vice chairman", "chairman emeritus", or "retired chairman." Brickley, Linck, and Coles (1999) provides information on CEO directorships after retiring from CEO positions outside of financial distress.

¹⁶To illustrate, the 2001 edition of the S&P Register contains information on 90,000 public and private companies, their 400,000 key executives, and over 70,000 biographies of top company officials. Who's Who in Finance and Business contains professional credentials of senior executives of the largest U.S. firms and other leaders in finance and business. Prior to 2004, it was named Marquis Who's Who in Finance and Industry.

The table also shows average CEO characteristics (Panel A), the frequency distribution across different categories of subsequent employment by relative year of departure (Panel B), and forced vs. voluntary turnover (Panel C). Managers finding new executive full-time employment are relatively young (mean 53 years), while those staying as Chairman are older (mean 57 years), have relatively long tenure (mean 7 years) and tend to step down voluntarily prior to bankruptcy filing. As expected, the fraction of CEOs maintaining full-time employment is higher when turnover is voluntary rather than forced (56% vs. 39%).

Panel D of Table 5 shows the frequency distribution across different employment types split by incumbent and turnaround CEOs. Of the 338 departed incumbent CEOs, 155 or 46% find new full-time executive employment or stay as Chairman. For the 124 departed turnaround CEOs, there are 65 or 52% in this category. Surprisingly, it appears that, conditional on departure, the labor market opportunities are not significantly different for incumbents and turnaround CEOs.

The fraction of all CEOs that maintain full-time employment is even higher when we also include the executives that remain CEO of the restructured company. There are 70 incumbents and 103 turnaround CEOs who retain the CEO position at the end of year Emergence+1, and five turnaround CEOs who are at the helm when their firms are acquired in Chapter 11. When including these, 398 or 62% of the 640 sample CEOs find new full-time executive employment or stay as CEO or Chairman. If we exclude the 33 executives that stay as Chairman, 365 or 57% of all CEOs maintain full-time executive employment. For incumbent CEOs, the corresponding sample proportions are 55% and 49%, respectively. In sum, a large fraction of the CEOs maintain a substantial labor market value despite bankruptcy filing. Precisely how much value these CEOs retain is the subject of the next section.

Finally, the last panel of Table 5 shows the industry and sales for the 187 firms that employ the departed CEOs and for the corresponding sample firms. The information on firm size (total assets, sales, number of employees), and industry is used below to identify matching firms when we estimate CEO post-employment compensation.¹⁷ As shown in Panel E, private firms hiring departed executives are significantly smaller than the bankrupt firms, while public firms are of a similar size. Of the departed executives who find new employment, only one-third join a firm in the

¹⁷The data is collected from Compustat, Capital IQ, Factiva, Wikipedia, and LinkedIn, and we do Google direct searches.

same two-digit industry as the sample firm. This suggests that managerial skills are not necessarily firm- or even industry-specific, so that a large number of departed managers have value also for companies in largely unrelated industries (Murphy and Zabojsnik, 2007).

4.2 Estimating CEO income loss

Having identified the CEOs' actual post-bankruptcy employment above, this section estimates their labor income change, including severance pay. As explained below, we directly observe or estimate CEO income at the new position (if any) and compute the CEO total labor market rent loss as the present value of the income change through retirement.

4.2.1 Severance pay

CEO employment contracts typically specify a minimum separation pay if the CEO is dismissed for “good reasons”, including departures due to incompetence or poor performance. Severance is normally not paid, however, if the CEO is asked to leave “for cause”, referring to willful misconduct or breach of fiduciary duties (Schwab and Thomas, 2004). Similarly, a CEO leaving voluntarily before expiration of the contract period is typically not entitled to any separation pay. Nevertheless, boards may—and frequently do—award severance pay at their discretion, often called “golden handshakes”. Separation agreements, which are negotiated and signed right before the CEO leaves the company, typically include non-compete and non-solicitation provisions for a period of one to two years. CEOs sometimes negotiate to retain employee status, for example by serving as Honorary Chairman, which can be viewed as a form of severance.

While our study is the first to document severance payments around Chapter 11 filings, Fee and Hadlock (2004), Yermack (2006) and Goldman and Huang (2011) provide evidence on separation pay outside of financial distress. These papers show that dismissed CEOs are much more likely to receive severance than CEOs who resign voluntarily. Goldman and Huang (2011) also find that boards exercise substantial discretion over severance pay in order to facilitate a smooth transition to the new CEO.

We collect information on severance awards to departing CEOs from 10-Ks and proxy statements through Edgar and Factiva news searches. All numbers are in constant 2009 dollars. Following Yermack (2006), we identify whether the separation pay is based on an explicit employment con-

tract or is discretionary.¹⁸ The discretionary part includes lump-sum cash payments, consulting agreements, loan forgiveness, adjustments to pension plans, and equity compensation adjustments, including continuation of vesting of options and restricted stocks.¹⁹

Table 6 documents the severance paid to our sample CEOs, classified by timing of departure (Panel A), forced vs. voluntary turnover (Panel B), incumbent vs. turnaround CEOs (Panel C), and type of subsequent employment (Panel D). Of the 462 departed CEOs, 27% receive a severance payment. Conditional on receiving severance, the median total payment is \$1.6 million or three times the CEO's annual pay. In general, a slightly larger severance amount is based on existing contracts (median \$0.5 million) than negotiated at departure (median \$0.4 million).

As shown in Panel A, 41% of the CEOs departing after the firm successfully emerges receive severance, compared to only 22% of CEOs departing while the firm is restructuring in bankruptcy. Consistent with the extant literature on severance, a higher fraction of CEOs that are forced to leave receive severance compared to CEOs that leave voluntarily (31% vs. 24%). The frequency of separation pay is similar across incumbents and turnaround CEOs. However, the median turnaround CEO receives no discretionary payment, and incumbent CEOs typically receive a higher total amount than turnaround CEOs (median \$1.8 million vs. \$1.5 million).

Finally, Panel D shows that one-third of executives who find new full-time executive employment receive severance (median \$2.2 million). Moreover, one-quarter of CEOs who fail to find new executive employment receive severance (median \$1.5 million), while none of the CEOs staying as Chairman receive any separation pay. It is possible that the transition to Chairman in itself provides sufficient compensation for leaving the executive position.

We now proceed to estimate the CEO income loss from bankruptcy filing, computed net of the observed severance pay.

¹⁸When Factiva only specifies a total severance, we assume that the entire amount is contract based.

¹⁹While we observe that severance pay to some degree is designed to compensate for lost pension, we do not have direct information on pension loss for our sample CEOs. As pension liabilities represent general unsecured claims against the firm in bankruptcy, many firms arrange trust funds or insurance to protect the CEO from pension losses in bankruptcy. For evidence on CEO pensions, see e.g. Bebchuk and Jackson (2005), Gerakosa (2010), and Sundaram and Yermack (2007). The latter study reports that, for S&P500 index firm CEOs, the median pension value is 7% of the value of their equity holdings.

4.2.2 CEO income loss estimates

We now turn to measures of the income change for the individual CEOs in our sample. The income change is the difference between the “old” and “new” incomes. Income data sources are described in Section 3 above. To measure the old income, we use the first income observation for the CEO, beginning with year -3, and we add severance pay if any.

The new income is estimated using the following procedure (also summarized in Appendix Table 3). For departed CEOs, there are four broad categories:

- (1) *New CEO position*: If the executive becomes CEO of a public company (29 cases), the new income is the actual pay from ExecuComp or, if not found, the CEO pay for a matching firm in ExecuComp with the same two-digit industry code and the closest match in sales, assets, or number of employees (whichever is available for the new firm). If the executive becomes CEO at a private company (68 cases), the new income is the CEO pay for an industry- and size-matched public firm, adjusted with a 30% cut in total pay following Gao, Lemmon, and Li (2011).²⁰
- (2) *New non-CEO executive position*: If the manager becomes a non-CEO executive at a public firm (49 cases), the new pay is the average non-CEO pay for the new firm or the closest industry- and size-match in ExecuComp. If the new employer is a private firm (41 cases), the new pay equals the non-CEO pay at the matched firm adjusted using the discount information in Gao, Lemmon, and Li (2011) as described above.
- (3) *Stay as Chairman of sample firm*: If the executive stays at the sample firm as Chairman of the board (33 cases), the new pay is the actual compensation in ExecuComp or, if not found, we use the non-CEO Chairman pay of the median firm in sales in the same two-digit industry.
- (4) *No new executive position*: For the 19 executives who become consultants and politicians, we assume an average income of \$300 thousand in 1995 US dollars. This is the average salary offered to principals at McKinsey over the sample period and matches consulting agreements

²⁰The median sales of the private firms in our sample is close to the median sales of the private firms in Gao, Lemmon, and Li (2011). We use an average of the coefficient estimates for the public dummy in their Table 6. For the comparison of cash pay in Appendix Table 3, we use a 12% discount.

actually observed in our sample.²¹ For the 26 managers who become self-employed, the new pay is the median income of the bottom decile of ExecuComp firms in number of employees in the same one-digit industry as the sample firm.²² Finally, for executives with no new employment, the new income is set to zero.

Moreover, for the 173 CEOs who are still CEO of the sample firms one year after emergence, the new income is from ExecuComp or a size/industry match in ExecuComp in the year of emergence.

For the departed CEOs, this process allows estimation of the income change for all but 13 cases with missing data on the CEO's old income and 16 cases where the CEO total pay at the sample firm was zero (obviously a temporary pay cut). Moreover, we choose to eliminate an additional 35 cases in the top ten percentile of the distribution for the percent change in total compensation. These managers either have a pre-departure income close to zero or receive large initial stock and option grants at their new firms, both of which creates large outliers when calculating percentage pay increase. This leave us with 398 departed CEOs with available income change data. Applying the same sample restriction to CEOs who stay with the firm eliminates 68 CEOs of emerging firms. Our total sample of CEOs with income change data is $398+105=503$.

Figure 2 shows histograms of the dollar change in total compensation for the CEOs that remain with the sample firm (Panel A) and for 72 executives that become CEO at another firm (Panel B). The distributions are negatively skewed with left-tail outliers and a median that exceeds the mean. We report both mean and median values in the tables documenting CEO income changes. However, to prevent outliers from distorting our inferences, we follow Gilson and Vetsuypens (1993) and much of the extant compensation literature and focus on median compensation changes.

Table 7 reports the change in total compensation in both dollar values and in percentages. The table also shows the total value of the CEO's income loss over the remainder of his work life, labeled "present value income change". This is the present value of the change in total compensation, using a 10% discount rate (the results are qualitatively unchanged with a 5% discount rate). The present

²¹For example, Donald Amaral of Coram Healthcare was paid \$200 thousand per year in his role as a consultant to the company. The consulting fee for Robert Kaufman to Carematrix Corp. was \$250,000 per year. Flag Telecom agreed to pay Andres Bande \$350,000 per year as consultant. In some cases, the total consulting fee is listed (rather than an annual fee). For example, Lodgian, Inc. agreed to pay Robert Cole a total fee of \$750,000 for his consulting services, while Covanta Energy agreed to pay Scott Mackin a total of \$1.75 million. The 1995 dollars is used because the first CEO becoming consultant in our sample occurs in 1995.

²²We match at the one-digit industry level because many firms in the bottom decile in the two-digit industry have a large number of employees, while the self-employed CEOs in our sample usually have less than five employees.

value adjusts for severance pay and the time it takes to find new employment. Moreover, the calculation assumes that the CEO will earn the new level of compensation until age 65 and zero thereafter. The present value income change is reported in dollars and as a multiple of the pre-turnover total pay.

As shown in the table, the median CEO experiences a 77% compensation drop and a present value income change of -\$2.7 million or 2.7 times his previous pay. In comparison, Gilson (1989) estimates a median present value of lost income which is close to six times the CEO's pre-turnover income, i.e. a relative loss almost twice as large as our estimate. Moreover, as discussed below, when we condition on the new employment, our estimated income loss is lowered further.

Importantly, Panel A of Table 7 reports the change in CEO total income classified by subsequent employment. The median present value income change is zero for CEOs who maintain full-time executive employment or stay as Chairman. In contrast, CEOs who fail to find new executive employment experience a median present value income change of -\$4.2 million or 4.7 time pay.²³

In Panel B, the total sample is divided into three parts: no turnover, voluntary turnover and forced turnover. The median CEO that retains his position with the restructured firm (no turnover) experiences a slight *increase* in income (14%) and a present value income change close to zero (consistent with Figure 1 above). CEOs who leave the distressed firm, on the other hand, see their pay drop (unconditionally). In voluntary departures, the median compensation drop is 84% and the present value income change is -\$2.2 million or 2.1 times the pay. However, when the CEO finds new executive employment or stays as Chairman after leaving voluntarily, the median rent loss is zero. CEOs that are forced to leave incur the largest costs with a median present value income change of -\$5.5 million, or 4.9 times the pre-turnover compensation. Interestingly, CEOs that are forced out typically experience a large income loss also if they find subsequent executive employment. These large costs suggest that CEOs forced to leave may have been able to extract substantial rents prior to losing their position.

Panels C and D of Table 7 show that the income loss does not vary systematically with neither the timing of the CEO's departure relative to bankruptcy filing, nor the CEO's tenure at the distressed firm. From Panel E, the youngest CEOs (less than 50 years old) typically experience the

²³Appendix Table 3 reports details on the compensation loss estimates for additional types of subsequent employment.

greatest labor market costs. This is in part because our bankruptcy cost measure stops the present value calculation at age 65, limiting the estimated loss period for older CEOs.

Panel F compares incumbent CEOs with turnaround CEOs. The unconditional median present value loss is -\$2.9 million (3.0 times pay) for incumbent CEOs and -\$2.1 million (2.3 times pay) for turnaround CEOs. While not shown in the table, the 71 turnaround CEOs that were hired in year 0 or later, and who definitely cannot be blamed for the bankruptcy filing, experience no discernable income loss: for this group the median is a statistically insignificant -\$1.1 mill. with a ratio of -0.6. The income loss of incumbent CEOs is significantly larger than that of turnaround CEOs hired in year zero or later. Panel F also shows the positive effect of receiving new employment. For the 185 incumbent CEOs and 97 turnaround CEOs who maintain full-time executive employment or stay as Chairman, the median present value income change is statistically indistinguishable from zero.²⁴

Finally, the last panel of Table 7 splits the sample by Chapter 11 outcome. Not surprisingly, CEOs of firms that liquidate in bankruptcy typically bear the largest costs (median present value income change of \$3.6 million or 4.7 times pay), while CEOs of firms that successfully emerge as restructured entities tend to fare better (median present value income loss of \$2.4 million or 2.2 times pay).

Overall, our results suggest that changes in CEO labor market rents vary substantially with the CEOs' subsequent employment opportunities, and is large and negative only when the CEO is forced to leave or leaves voluntarily but does not receive continued executive employment. Managers who remain with the restructured firm, as CEO or Chairman, or leave voluntarily to assume a full-time executive position with another firm (including chairman), typically experience no discernible loss of income.

5 Do predicted bankruptcy costs affect CEO turnover and pay?

We now turn to a cross-sectional analysis of the probability that the departed CEO is rehired and the magnitude of his compensation loss. The cross-sectional regressions are used to generate estimates of the ex-ante *predicted* CEO bankruptcy costs conditional on leaving the sample firm. As a benchmark, we use the predicted income change for a CEO who retains his position with the

²⁴Appendix Table 4 provides further details on the income change for incumbents and turnaround CEOs.

distressed firm. We analyze how the predicted bankruptcy costs affect (1) the probability of forced vs. voluntary turnover and (2) the design of the CEO’s compensation contract (the proportion of total pay that is paid in cash).

5.1 A cross-sectional model for CEO bankruptcy costs

Model (1) of Table 8 reports the coefficient estimates for the probability that the departed CEO is rehired in a full-time executive position or stays as Chairman vs. fails to find new full-time employment. The sample is 430 CEOs departing in year -2 through the year after a restructured firm emerges or liquidation/acquisition in bankruptcy and with complete information on all control variables.

The first two explanatory variables indicate the timing of CEO departure relative to Chapter 11 filing. The variable *Before (During)* takes the value of one if the CEO departs in year -2 or -1 (year 0 through the year of bankruptcy resolution), and zero otherwise. The regression also includes CEO characteristics from the fiscal year prior to turnover (*Age, Tenure, Chairman, Incumbent*), as well as an interaction variable $Before \times Incumbent$. This variable is included to allow for a different timing of the turnover of incumbents and turnaround CEOs. We further control for industry-wide financial distress by entering *IndDistress*. Finally, we include three dummy variables: *prepack*, taking a value of one if the case is prepackaged or pre-negotiated, *Acquisition* and *Liquidation*, taking a value of one if the CEO departs in the year of filing or later and the firm is either acquired or liquidated in bankruptcy, respectively. Two of the variables enter with highly significant coefficients: *Age* and $Before \times Incumbent$. That is, younger CEOs and incumbent CEOs leaving prior to filing (versus during bankruptcy) have a relatively high likelihood of finding new full-time employment.

Table 8 further reports the results of two ordinary least squares (OLS) regressions for the CEO income change in \$ thousand (Model 2) and the present value of income change in \$ million (Model 3) of the departed CEOs. The explanatory variables are the same as before. Consistent with the univariate results in Table 7 above, present value of income change is increasing in *Age*. The age affect in part reflects that the opportunity cost of departing approaches zero as the CEO approaches retirement age. Thus, older CEOs tend to lose less as they leave their executive position.

Moreover, *Tenure* and *Chairman* produce negative and significant coefficients in both regres-

sions. It is possible that relatively powerful and influential CEOs are to a greater degree tainted by the default and so incur larger personal costs upon departure. The reason may be that CEOs with longer tenure and more board control enjoy greater rents at the failing firm, and so have more to lose from departing, relative to the average CEO in the sample. The rents may reflect a combination of entrenchment and firm-specific skills, both of which are difficult to transfer to the next employer.

The last two columns in Table 8 show OLS coefficient estimates for the annual income change (Model 4) and the present value of income change (Model 5) of CEOs that retain their position with the bankrupt firm through the subsequent fiscal year. The total sample for these regressions is 782 CEO-years. Here, the income change is measured from one year through the next, thus requiring each CEO to remain in place for two consecutive years. As before, CEO age has a positive effect on the present value of income change. Moreover, the interaction variable *Before* \times *Incumbent* enters with a positive sign, while *Before* enters with a negative sign. Incumbent CEOs tend to suffer smaller income losses in the years prior to bankruptcy filing compared to subsequent years, while the opposite is true for turnaround CEOs. The size of the two coefficients are, however, of similar magnitude, suggesting that the timing itself has relatively little impact on the magnitude of the average CEO's income loss.

Using the regressions in Table 8, we generate (cross-sectionally) predicted values for the managerial bankruptcy costs for all firm-years in our sample. The first cost measure is the predicted probability that a departed CEO is rehired into an executive position (vs fails to find new employment). The second and third cost measures are the difference in the predicted income change and present value income change, respectively, conditional on leaving and conditional on staying. These two measures capture the additional expected cost for a CEO of leaving the firm at a given point in time, using the alternative of maintaining the CEO position as a benchmark. We next turn to an analysis of how these predicted managerial bankruptcy costs affect CEO turnover decisions and compensation contracts at the distressed firms.

5.2 Predicted bankruptcy costs and CEO turnover

Table 9 presents coefficient estimates from multinomial logit regressions of voluntary versus forced turnover (versus no turnover). The regressions include variables that capture the control rights of

institutional shareholders, secured creditors, bondholders and trade creditors. The sample is 1,347 firm-years with a full set of control variables. The benchmark category is 1,048 firm-years with no CEO turnover. There are 147 cases of voluntary turnover and 152 cases of forced turnover. To control for the impact of exogenous shocks to specific industries, all regressions include industry fixed effects at the two-digit industry level. The first model uses the relative time period dummies, CEO characteristics, and firm characteristics as explanatory variables. The second and third models include our measures for expected personal bankruptcy costs derived above, and thus exclude the explanatory variables used to construct these predicted values.

Starting with the CEO characteristics, the likelihood of leaving voluntarily is higher for older CEOs, perhaps because they choose to retire or stay as Chairman, and lower for CEOs who are Chairman of the board. The variable *Incumbent* produces positive and significant coefficients in the forced and voluntary turnover decision. This suggests that incumbent CEOs are more likely to leave voluntarily or be forced out than turnaround CEOs. The regressions further include the percent equity owned by the CEO, which reduces the probability of voluntary turnover. CEOs with large equity ownership have their wealth closely tied to the company's value, which may provide strong incentives to stay in an attempt to rescue the firm.

All models contain selected firm characteristics. Firm size, asset tangibility, and industry distress have either no or only a marginally significant impact on the turnover probability. However, the impact of *Industry adjusted ROA* is large and significantly negative: the higher the industry-adjusted operating margin (EBITDA/assets), the lower the likelihood of both voluntary and forced turnover. This suggests that CEOs are more prone to leave firms with relatively poor operating performance, a finding which is consistent with the extant turnover literature for non-bankrupt firms (Huson, Parrino, and Starks, 2001). The regression also includes the variable *Prepack*, which takes the value of one in the year of filing and through the end of the sample period if the firm files a prepackaged bankruptcy filing, and zero otherwise. The estimated *Prepack* coefficient is positive and statistically significant in the voluntary turnover decision, indicating that CEOs who successfully negotiate a prepacked Chapter 11 filing tend to leave voluntarily afterwards.

The remaining variables are intended to capture the influence of various stakeholder groups on CEO turnover throughout the restructuring process. Interestingly, the probability of forced turnover decreases with *Institution* $\geq 25\%$. Thus, it appears that CEOs of firms with high institu-

tional ownership are less likely to be forced out than CEOs of firms with low institutional ownership. Since control rights shift to creditors when approaching bankruptcy, institutional shareholders have only a limited direct influence over the CEO turnover decision. So the the coefficient estimate may pick up an institutional tendency to hold stock in companies where they perceive CEO quality to be high (and so the need to force the CEO out is relatively low), rather than active involvement in the CEO firing decision.²⁵

DIP Financing is a dummy variable indicating that the bankrupt firm receives debtor-in-possession (DIP) financing from its prepetition lenders. More than three quarters of the DIP facilities in our sample is provided by prepetition lenders, consistent with Dahiya, John, Puri, and Ramirez (2003). The reasons for prepetition lenders to provide DIP financing range from enforcing governance and the priority of their prepetition loans (Skeel, 2003) to continuing prior lending relationship (Li and Srinivasan, 2011).²⁶ The coefficient for *DIP Financing* is positive and significant for both voluntary and forced turnover, suggesting that large prepetition lenders influence CEO turnover. This influence could be channeled both through contractual provisions in the DIP financing contract and through direct influence on the CEO during DIP financing negotiations.

The next two variables capture the influence of unsecured creditors. The dummy variables *Bond debt \geq 70% of liabilities* and *Trade debt \geq 70% of liabilities* take a value of one when public bonds and trade credits, respectively, exceed 70% of total liabilities. The regressions indicate that firms with large trade credits are less likely to dismiss the CEO. Suppliers may prefer to maintain business relationships with an experienced CEO throughout bankruptcy reorganization, hoping for a continued business relationship with the restructured firm. A related argument is made by Kolay and Lemmon (2012), who find that suppliers continue to support their distressed customers by extending short-term credit, possibly in an attempt to avoid fixed switching costs. Also, Hertz, Li, Officer, and Rodgers (2008) provide evidence that bankruptcy filing tends to have a large negative valuation impact on suppliers.

²⁵Coelho, Taffler, and John (2010) provide evidence on institutional equity sales as the portfolio companies approach bankruptcy. Jiang, Li, and Wang (2012) report that hedge funds pursue an active ownership strategy prior to bankruptcy for only 7% of the sample firms and acquire sufficient equity to file a 13-D during bankruptcy reorganization for only 4% of the firms.

²⁶DIP lenders commonly request that their existing loans are packaged with the DIP loan in order to increase the seniority of the prepetition loan, known as a rollup provision.

Models (2) and (3) in Table 9 include the effect of predicted managerial costs of bankruptcy on voluntary and forced turnover (again, versus no turnover). The costs are the predicted probability of the CEO being rehired (both models), the predicted income change of staying v. departing (model (2) only), and the present value of income loss (model (3) only). Note that the inclusion of these predicted costs does not materially change the inferences for the other variables. Interestingly, the predicted probability of being rehired *reduces* the probability of both voluntary and forced CEO turnover. If one interprets greater predicted probability of being rehired as a measure of CEO quality, then this means that relatively high-quality CEOs (with relatively good prospects for outside employment) are more likely to stay with the distressed firm when it approaches bankruptcy.

Interestingly, Table 9 also shows that greater predicted CEO compensation (rent) loss is associated with a higher likelihood of forced turnover. This evidence is consistent with the proposition that low-quality managers tend to stay with the distressed firm in an attempt to keep extracting labor market rents—until forced out (perhaps by creditors). Given our interpretation of greater predicted compensation loss as reflecting lower CEO managerial quality, this evidence indicates that the bankruptcy process separates high- from low-quality CEOs and retains primarily the former type. To our knowledge, ours is the first paper to show such an effect of *ex ante* personal bankruptcy cost estimates.

In sum, CEO turnover increases as the distressed firm restructures in bankruptcy. Some of the forced turnover is associated with control rights held by prepetition lenders through the DIP financing facility. At the same time, the likelihood of forced CEO turnover is lower when institutions own a large fraction of the firm’s equity, and when a large fraction of the firm’s liabilities are trade credits. The influence of lenders on the CEO turnover decision is not surprising given the significant shift in control rights from shareholders to creditors of financially distressed firm over the past two decades. Moreover, we find that predicted managerial costs of bankruptcy help explain the CEO turnover decision: the greater the predicted probability of being rehired (if departing the firm), the lower voluntary and forced turnover. Moreover, greater predicted income loss is associated with higher forced turnover rates.

Having shown that the CEO’s decision to voluntarily leave a financially distressed firm depends on predicted personal bankruptcy costs, we next examine whether greater predicted bankruptcy costs also affect the CEO’s compensation contract *ex ante*, focusing on both the level and structure

of the total compensation package at distressed firms.

5.3 Predicted bankruptcy costs and CEO compensation

Table 10 presents OLS estimates of the coefficients in regressions of the natural logarithm of total compensation (Models 1-3) and the proportion of the total compensation that is paid in cash versus equity (Models 4-6). The sample is 1,266 firm-years from two years prior to filing through one year after emergence or the year of liquidation/acquisition for the 342 sample firms. The three first explanatory variables are the predicted probability of being rehired, predicted income change of departing v. staying with the distressed firm, and the present value of this predicted income change. We first discuss the impact of the remaining explanatory variables in Table 10 before returning the effect of these three measures of *ex ante* personal bankruptcy costs.

As above, the regressions control for the time period relative to Chapter 11 filing (before and during), CEO characteristics (age, tenure, chairmanship, and equity ownership), firm characteristics (size, asset tangibility, profitability, leverage, industry distress, and prepack) and industry fixed effects. Given the results of Table 4, we also control for possible compensation differences between external and internal hires. This is done using three dummy variables separating out (i) incumbent CEOs that depart during the sample period, (ii) turnaround CEOs hired from the inside and (iii) turnaround CEOs hired from the outside. The baseline comparison sample is therefore incumbent CEOs that stay through year Emergence+1.

As shown, the average CEO compensation is lower before and during Chapter 11 reorganization compared to after emergence. Consistent with Figure 1 above, reorganized firms pay competitive salaries to attract and retain high-quality CEOs after emerging from bankruptcy. During bankruptcy, a relatively high proportion of the pay is in cash, perhaps reflecting low stock liquidity (the firm's equity trades at penny prices, if traded at all). The total pay and the fraction of equity pay are decreasing in age and *Ownpct*, suggesting that older CEOs and CEOs with relatively high stock ownership prefer cash compensation, possibly driven by lower risk tolerance.

Note that, in the multivariate setting of Table 10, there is no evidence of a significant difference in the level of the total compensation between incumbent CEOs that leave during the sample period or turnaround CEOs hired from the outside and incumbents that retain their position with the restructured firm. This contrasts with the univariate comparison in Table 4 above, which

indicates a significantly higher pay for externally recruited CEOs. Essentially, the higher pay for externally recruited CEOs in Table 4 is driven by a signing bonus in the year of hire rather than a sustained level of pay (where Table 10 picks up the latter). On the other hand, consistent with Table 4, turnaround CEOs hired from the inside are on average paid less than incumbent CEOs and turnaround CEOs recruited externally. Moreover, turnaround CEOs hired externally tend to receive a higher proportion of equity-based pay compared to incumbent CEOs that stay, in an attempt to align their incentives with shareholder value-maximization.

Table 10 further shows that CEO pay and the fraction of equity pay is lower for firms filing prepacks and firms in distressed industries. Also, consistent with the prior compensation literature, top executive compensation increases with firm size, and decreases with industry-adjusted leverage and fraction of tangible assets. Moreover, we find that the proportion of cash pay is decreasing in firm size and increasing in leverage—also consistent with the broader compensation literature.

Turning to the effect of the CEO's predicted loss of rents from bankruptcy on the level and structure of his compensation at the distressed firm, the predicted rehiring probability produces highly significant coefficients in all specifications. CEOs who are more likely to find new executive employment (and thus have lower predicted bankruptcy costs) on average receive higher total compensation and a lower fraction of cash pay. A consistent interpretation is that the higher compensation reflects a greater CEO quality which implies lower bankruptcy costs in terms of the probability of finding new employment. Moreover, relatively high-quality CEOs may be less risk averse and more willing to accept a larger fraction of pay in equity.

Interestingly, the fraction of cash pay is increasing in the CEO's predicted labor market rent loss. Again, we expect this measure of bankruptcy cost to be inversely related to CEO quality and/or the degree of specialization of the CEO's human capital to the firm. Under this interpretation, the positive correlation between the proportion cash pay and present value income change suggests that CEOs with relatively high *ex-ante* personal costs of bankruptcy are more risk-averse. That is, the greater the cash proportion, the greater the *ex ante* risk-sharing between shareholders and executives. Overall, these results confirm that our measure of the predicted loss of CEO labor market rents affect both the total compensation and incentive design in the compensation contract.

6 CEO equity losses

In this section, we introduce wealth losses associated with the CEOs' equity holdings in the bankrupt firm. These equity holdings may to a large extent be considered a financial investment—at least to the extent that they have vested—and therefore independent of any effects of financial distress on the CEO's equilibrium compensation. Nevertheless, adding information on the CEO equity losses helps provide a more complete picture of CEO personal costs of corporate bankruptcy.

We collect annual data on CEO equity holdings in the bankrupt firm, including shares held and unexercised options, using the year-end values reported by the company. In the fiscal year prior to bankruptcy filing (year -1), the median incumbent CEO owns 2.1% of the shares in the sample firm. The typical shareholding is valued at \$1.8 million, while the unexercised options are out-of-the-money and thus basically worthless. Since the stock price approaches zero when the firm files for bankruptcy, the typical CEO experiences an equity loss in the year leading up to default of about two-thirds the size of the sample-wide median present value income change.

Figure 3 plots the median percent stock ownership (Panel A) and dollar value of the total equity holdings (Panel B) of incumbent CEOs from year -3 through one year after emergence (year Emergence+1). As a CEO is turned over, the firm drops out of the sample unless he is replaced with another incumbent CEO (i.e., promoted from the inside). For comparison, the dotted line shows the CEO stock ownership for industry-size matched firms from ExecuComp. As shown in Panel A, the matching firm CEOs have a median stock ownership of about 0.6%, which remains relatively stable over time. The typical incumbent CEO in our sample also holds his share ownership of 2.1% constant in the years leading up to bankruptcy.

However, in the year of filing, the CEO stock ownership declines to 1.5%. This may be a result of insider sales of stock leading up to bankruptcy filing—recall from above that voluntary turnover is higher for CEOs with relatively low ownership stakes, imputing an upward selection bias in the median CEO ownership plotted over time. At year-end after the firm emerges from bankruptcy, the median share ownership is 0.7% for incumbent CEOs that remain with the restructured firm. Interestingly, the ownership stake increases substantially in the following year, reflecting an incentive realignment through CEO equity grants following financial restructuring.

While the incumbent CEO's percent share ownership is relatively stable prior to bankruptcy,

the value of equity declines sharply as the firm approaches bankruptcy. Panel B of Figure 3 shows that the median CEO equity value declines from \$8.5 million in year -3, to \$6.5 million in year -2, to \$0.1 million in the year of bankruptcy filing, of which \$3.0 million, \$1.6 million and \$0.0 is the value of unexercised options in the respective year. One year after the firm has emerged from bankruptcy, the value of the CEO's equity holdings is restored at \$3.6 million (of which \$0.3 million is options), possibly reflecting large equity grants to CEOs of restructured firms. Note also that the median dollar value of the matching firm CEOs' equity holdings declines from \$11.7 million in year -3 to \$8.9 million in the year of bankruptcy filing, despite a relatively constant percent share ownership.

Overall, our evidence shows that CEOs of distressed firms make substantial losses on their equity holdings as the firm approaches bankruptcy. Once the firm is restructured, CEOs who stay experience a quick recovery of their equity positions through large equity grants. These grants help the restructured firms achieve a competitive compensation package and they align CEO incentives with shareholder value maximization.

7 Conclusion

There are multiple sources of personal costs of corporate bankruptcy, ranging from retraining and relocation expenses to loss of future employment income (human capital) and equity investment value in the bankrupt firm. While personal bankruptcy costs are relevant for the wage-contracting process generally, the costs incurred by the firm's top executives are of particular interest to corporate finance. High expected personal costs may cause risk-averse executives to hedge against default by reducing corporate leverage and perhaps under-invest in risky corporate projects—resulting in a potentially important form of agency costs of debt.

We estimate CEO human capital losses using a large sample of Chapter 11 filings of publicly traded U.S. firms after 1995, a market-oriented era of Chapter 11 proceedings. The estimates account for the executives employment after bankruptcy filing, which have been missing in the extant literature on CEO compensation of U.S. public firms. Overall, our results suggest that changes in CEO labor market rents vary substantially with the CEOs' subsequent employment opportunities, and are large and negative only when the CEO is forced to leave or leaves voluntarily

but does not receive continued executive employment.

Managers who remain with the restructured firm, as CEO or Chairman, or leave voluntarily to assume a full-time executive position with another firm, typically experience no discernible loss of income. Fully half of the incumbent CEOs maintain full-time executive employment (either after departing or in the restructured company) with a median estimated labor income loss of zero. Thus, these CEOs are not particularly “tainted” by the bankruptcy event.

In contrast, CEOs who fail to maintain executive employment experience a median loss equal to five times their pre-departure labor income (an income loss with a median present value of \$4.2 million in constant 2009 dollars, discounted at 10% until retirement age). Across the full sample of CEOs, the median loss of labor market rents is -\$2.7 million or 2.7 times the pre-filing income. This ratio is significantly lower than what has been reported earlier.

CEO turnover increases as the distressed firm restructures in bankruptcy. Some of the forced turnover is associated with control rights held by prepetition lenders through the DIP financing facility. At the same time, the likelihood of forced CEO turnover is lower when institutions own a large fraction of the firm’s equity, and when a large fraction of the firm’s liabilities are trade credits. The influence of lenders on the CEO turnover decision is not surprising given the significant shift in control rights from shareholders to creditors of financially distressed firm over the past two decades.

We find that *predicted* managerial costs of bankruptcy help explain the CEO turnover decision: the greater the predicted probability of being rehired (after departing the distressed firm), the lower voluntary and forced turnover. Moreover, greater predicted income loss is associated with higher forced turnover rates. The former suggests that relatively high-quality CEOs tend to remain with the firm towards bankruptcy filing, while the latter suggests that some CEOs who earn supra-competitive labor market rents remain until forced out (sometimes by creditors).

We also discover that the proportion equity pay in the CEO’s compensation package is decreasing in the predicted income loss, similar to a labor-contract hedge. To our knowledge, this is the first evidence to suggest that the existence of executive personal cost of corporate bankruptcy affects labor market contracting ex ante—a potent topic for future research.

CEO equity losses prior to Chapter 11 filing are significant. Three years prior to filing, the median value of the CEO’s equity holding is \$8 million. This value drops to \$2 million in year -1, and to zero upon filing. It is unclear whether the drop in equity value prior to year -1 should be

counted as a “bankruptcy cost” as the CEO chooses to keep the (vested portion of the) investment. In our view, the loss of \$2 million from year -1 is most likely unavoidable and therefore should be viewed as a *bona fide* personal bankruptcy cost component. Interestingly, we discover that greater stock ownership lowers the probability that the CEO leaves voluntarily, suggesting that equity ownership provides an incentive to stay with and help turn around the firm. This positive effect of stock-based compensation is, to our knowledge, also new to the CEO compensation and contracting literature.

An interesting further topic for future research is the relationship between personal CEO costs of corporate bankruptcy as defined here and *corporate* bankruptcy costs. For example, while greater resource specialization is typically viewed as giving rise to greater corporate cost of bankruptcy, the human capital of the managers of such firms may be similarly specialized. The existence of a positive correlation between personal CEO- and corporate bankruptcy costs may help explain the cross-sectional variation in corporate leverage ratios better than a singular focus on corporate bankruptcy costs.

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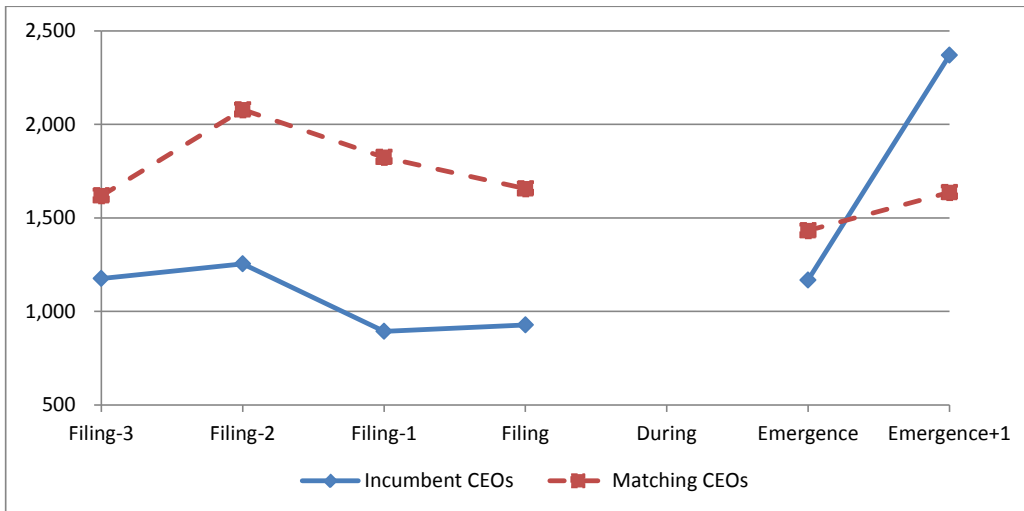
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Figure 1
Median incumbent CEO total pay by event year relative to Chapter 11 filing

The graphs plot the CEO pay for 342 large public firms filing for Chapter 11 in 1996-2007. Panel A shows the median total pay, while Panel B shows an index of the median total pay. Total pay is the sum of salary, bonus, long-term incentive plans, and stock and option grants in \$ thousands. After emergence, the plots are restricted to 54 firms that successfully emerge from bankruptcy as an independent company. The matching firms are from ExecuComp, and are matched on sales and two-digit industry code if the ratio of sales between the sample firm and the matching firm is between 0.7 and 1.3, and otherwise matched on sales and the one-digit SIC code.

A: Median incumbent CEO income in \$ thousands



B: Median incumbent CEO income index

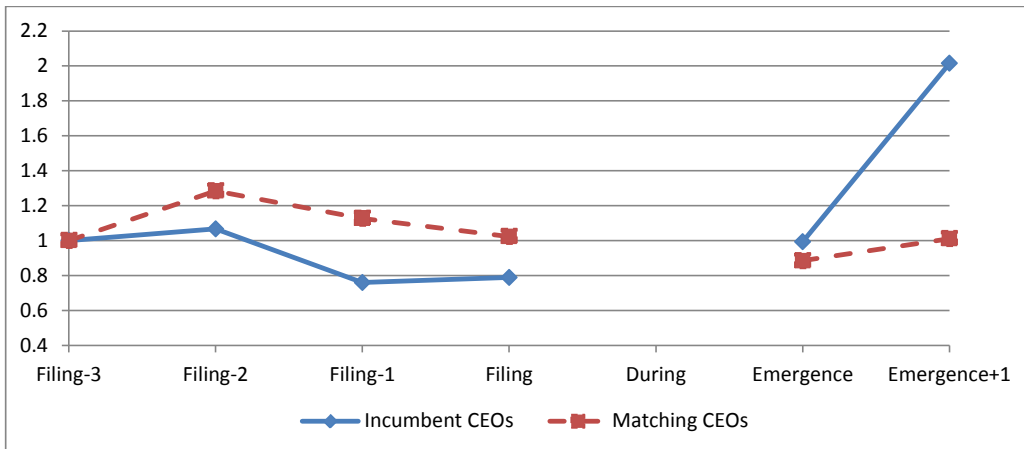
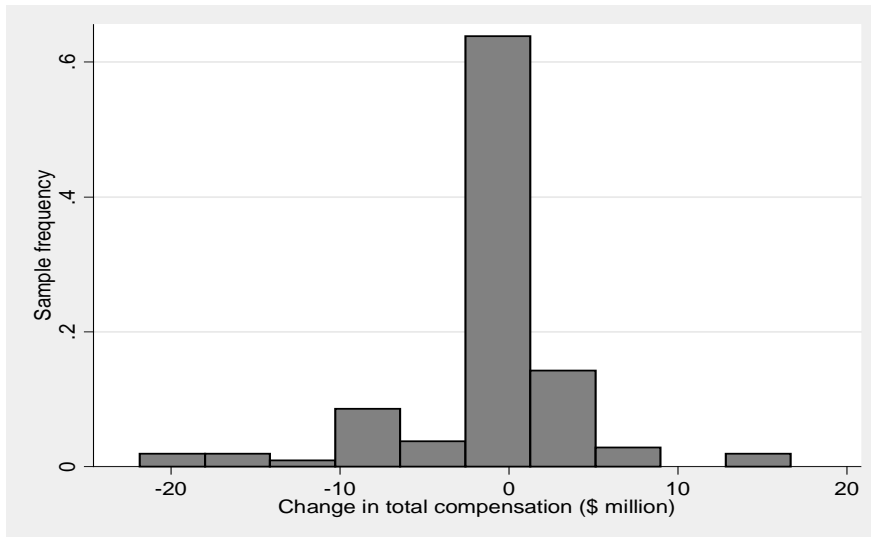


Figure 2
Distribution of the dollar change in CEO total compensation through bankruptcy

Both figures plot the distribution of the dollar change in total compensation for CEOs of 342 large public firms that filed for Chapter 11 in 1996-2007. Panel A shows the compensation change for 105 CEOs that retain their position with the restructured firm one year after emergence. Panel B shows the compensation change for 72 CEOs who left the distressed firm and became CEO of another firm. Total compensation is the sum of salary, bonus, long-term incentive plans, and stock and option grants in \$ million. The "old" income is from year -3 or the year that the CEO is hired at the sample firm. The estimation of the "new" income is explained in Appendix Table 2.

A. Compensation change for 105 CEOs retaining the CEO position at the restructured firm

Mean: -\$1.0 mill. Median: \$0.1 mill. Standard deviation \$5.3 mill; Skewness: -\$1.2 mill.



B. Compensation change for 72 CEOs moving to a new CEO position in a public or private firm

Mean -\$2.5 mill. Median: -\$0.3 Standard deviation: \$7.8 mill; Skewness: -\$3.0 mill.

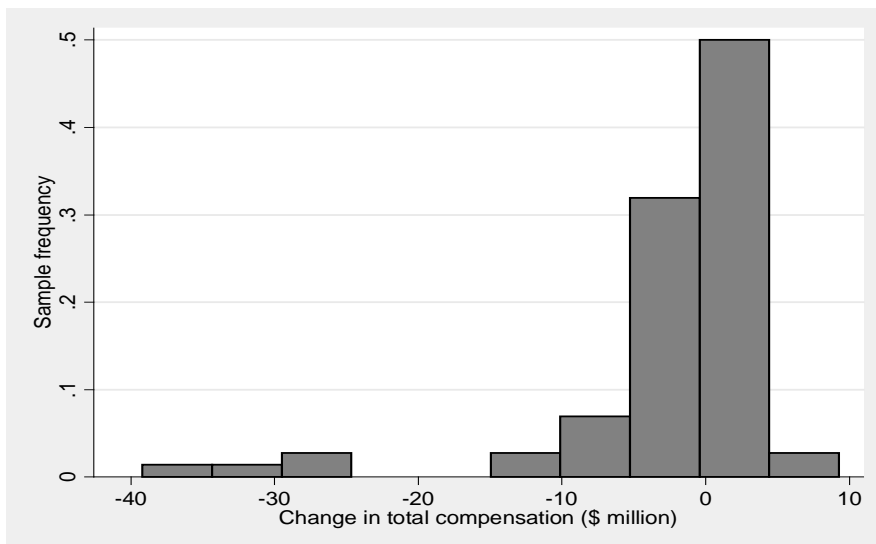
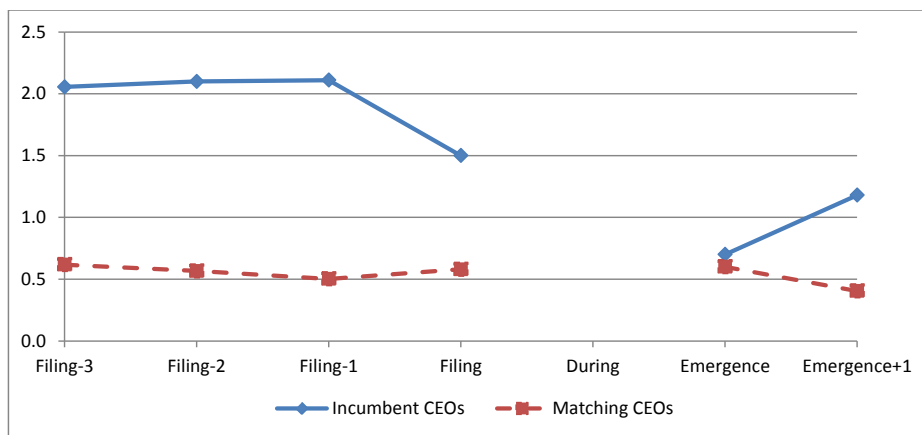


Figure 3
Percent shareownership and equity value of incumbent CEO

Panel A shows the percent stock ownership and Panel B the value of equity (stock and unexercised options in \$ million) for incumbent CEOs. The sample is 408 incumbent CEOs at 342 large public firms that filed for Chapter 11 in 1996-2007. An incumbent CEO is in place at the beginning of year -2 or promoted internally in year -2 or -1 relative to filing. A firm drops out of the sample once an incumbent CEO leaves, unless he is replaced by another incumbent CEO. The matching firms are from ExecuComp, matched on sales and 2-digit SIC industry code if the ratio of sales between the sample firm and the matching firm is between 0.7 and 1.3, and otherwise matched on sales and the one-digit SIC code.

A: Median percent CEO shareownership



B: Median value of CEO equity ownership (stock and unexercised options) in \$ million

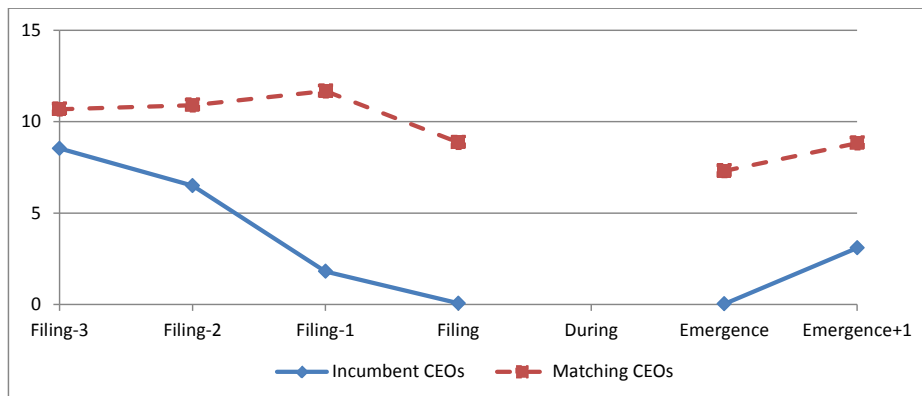


Table 1
Annual distribution of sample of 342 firms filing for Chapter 11

The sample is 342 large public firms filing for US Chapter 11 bankruptcy in 1996-2007. Sales and book value of total assets are in constant 2009 US dollars, and from the last fiscal year prior to filing.

Year	N	Sales (\$ mill.)		Total assets (\$ mill.)		Duration ^a (months)		Prepack (%)	Bankruptcy outcome (%)		
		mean	median	mean	median	mean	median		Emer- gence	Liqui- dation	Acqui- sition
1996	7	1,972	832	829	593	8.5	4.5	43	43	43	14
1997	14	1,551	627	1,206	462	21.6	12.9	36	86	14	0
1998	26	715	389	736	500	19.1	13.3	27	65	27	8
1999	33	1,311	666	1,646	888	15.9	8.6	39	61	33	6
2000	56	1,341	684	1,386	582	21.8	18.1	21	57	29	14
2001	63	3,770	768	3,873	1103	17.1	12.7	17	54	35	11
2002	57	3,666	988	6,976	1067	13.1	8.9	46	63	19	18
2003	36	1,077	729	2,028	741	16.0	10.0	31	75	17	8
2004	16	1,381	561	1,585	766	12.2	10.2	38	88	13	0
2005	17	5,854	1,017	9,194	770	17.7	16.7	12	71	18	12
2006	8	1,964	990	1,660	477	9.3	5.6	63	100	0	0
2007	9	22,329 ^b	545	4,178	705	10.2	11.6	33	44	56	0
All	342	\$2,912	\$739	\$3,278	\$798	16.6	12.7	30%	64%	26%	10%

^a Duration is the number of months from bankruptcy filing to confirmation of the reorganization plan. In our sample, 48% of the cases are resolved within 12 months and 78% within 24 months. Prepackaged bankruptcies have an average duration of 6 month (median 5 months).

^b In 2007, American Home Mortgage Investment Corp. filed with \$194 billion in assets.

Table 2
CEO turnover in event time and reason for turnover

Panel A shows CEO entry and departure by fiscal year relative to bankruptcy filing (0 is the filing year) and emergence. *During bankruptcy* is firm-years from filing through case resolution. *After emergence* is limited to firms emerging from bankruptcy. Panel B shows CEO turnover by reason. The sample is 342 large public firms filing for US Chapter 11 in 1996-2007, with data on 640 CEOs from year 1994 through 2010. Definitions of incumbent CEOs, turnaround CEOs and forced departure are in Appendix Table 1.

A: CEO entry and departure by year relative to Chapter 11 filing and emergence

Event year	No. of firm-years	Incoming CEOs		Departing CEOs				Forced turnover	
		Incumbent	Turn-around	All	Incumbent	Turn-around	N	%	
<i>Before bankruptcy</i>									
-3		338 ^a							
-2	342	30	36	62 ^b	19	62	0	19	31
-1	342	40	47	87	25	77	10	43	49
Subtotal	684	70	83	149	22	139	10	62	42
<i>During bankruptcy</i> ^c									
Filing (0)	342	0	100	100	29	80	20	56	56
Filing+1	250	0	33	92	35	50	42	49	53
Filing+2	116	0	12	55	45	33	22	41	74
Filing+3 through Filing+9	63 ^d	0	4	20	32	9	11	12	60
Subtotal	771	0	149	267	35	172	95	158	59
<i>After Emergence</i> ^e									
Emergence+1	219	0	0	46	21	27	19	18	39
Total	1,674	408	232	462	28%	338	124	238	52%

B: CEO departures by reason for turnover

Reason for CEO departure	All departed CEOs		Forced departure		Departed incumbents		Departed turn-around CEOs	
	N	%	N	%	N	%	N	%
Resigned for personal reasons	99	21	44	44	77	78	22	22
Pursue other interest	51	11	24	47	31	61	20	39
Pressured by board, shareholders and creditors	63	13	63	100	57	90	6	10
Performance related	17	4	17	100	14	82	3	18
Liquidation or acquisition	91	19	64	70	51	56	40	49
Retirement or normal succession	65	15	0	0	60	92	5	8
Death or illness	2	0	0	0	1	50	1	50
Other reasons	27	6	0	0	11	41	15	59
No reason given	47	10	26	55	36	77	11	23
Total	462	100%	238	52%	338	73%	124	23%

^a 338 incumbent CEOs are in place at the end of year -3. Four firms enter the sample through an IPO in year -2.

^b The 19% turnover rate includes four departed CEOs with missing data on their personal characteristics.

^c 111 cases are resolved in year 0, 136 in Filing+1, 65 in Filing+2, and 30 in Filing+3 through Filing+9.

^d The 63 firm-years represent 30 unique firms.

^e This category only includes firms that emerge as independent restructured companies, and thus excludes the 35 firms that were acquired in Chapter 11 and the 88 firms that were liquidated (see Table 1).

Table 3
Provability and timing of incumbent CEO turnover around Chapter 11 filing

Model (1) is a logit regression, where $y=1$ if the incumbent CEO leaves in year -2 or -1 (0 is the filing year). Model (2) is a multinomial logit regression where $y_1=1$ if this turnover is forced and $y_2=1$ if it is voluntary. In both models, the baseline is cases where the incumbent CEO is in place in year 0. Model (3) is a logit regression, where $y=1$ if the incumbent CEO retains his position at year-end Emergence+1 and $y=0$ if he departs during the sample period. The sample is 368 incumbent CEOs at 342 large public firms filing for bankruptcy 1996-2007. An incumbent CEO is in place at the beginning of year -2, or internally promoted in year -2 or -1. CEO characteristics and firm-level control variables are from year -1. For CEOs departing in year -1 and -2, the characteristics are from year -2 and -3, respectively. The regressions control for industry fixed effects at the 1-digit SIC code level. Standard errors are in brackets. ***, **, and * denotes significance at the 1%, 5% and 10% level, respectively. All variables are defined in Appendix Table 1.

Dependent variable:	(1)	(2)		(3)
	Depart before bankruptcy	Voluntary turnover	Forced turnover	Retain CEO position in Emergence+1
Intercept	-1.103 [1.124]	-2.608* [1.339]	-0.472 [1.608]	0.366 [1.495]
<i>CEO characteristics:</i>				
Age	0.032** [0.016]	0.049** [0.019]	0.007 [0.022]	-0.042** [0.021]
Tenure	-0.026 [0.028]	-0.013 [0.033]	-0.045 [0.041]	-0.006 [0.038]
Chairman	-0.181 [0.253]	-0.570* [0.300]	0.442 [0.374]	0.287 [0.330]
Ownpct	-0.056*** [0.016]	-0.066*** [0.023]	-0.045** [0.021]	-0.005 [0.015]
<i>Firm characteristics:</i>				
Size	-0.035 [0.095]	-0.030 [0.112]	-0.057 [0.138]	-0.029 [0.129]
Industry adjusted ROA	0.020 [0.968]	-0.397 [1.096]	0.916 [1.540]	2.297* [1.338]
Industry adjusted leverage	0.225 [0.266]	0.283 [0.309]	0.085 [0.377]	0.470 [0.337]
Tangibility	-0.595 [0.558]	-0.590 [0.680]	-0.665 [0.771]	1.327* [0.739]
IndDistress	-0.281 [0.355]	-0.029 [0.400]	-0.854 [0.615]	0.398 [0.398]
Institution \geq 25%	-0.499* [0.258]	-0.360 [0.304]	-0.732* [0.381]	-0.025 [0.335]
N	368	368		368
y=1	124	76	48	57
y=0	244		244	311
Pseudo R^2	0.082	0.093		0.105

Table 4
Comparison of total compensation and proportion cash pay for newly hired and outgoing CEOs

The table compares the pay package offered to newly hired CEOs in the year when they are hired to the pay package of outgoing CEOs in the year before they are replaced. Panel A presents univariate comparison on internally promoted CEOs while Panel B presents univariate comparison on externally hired CEOs. P-values from a two-tailed t-test on the mean difference and Wilcoxon Signrank test on the median difference are presented in the last two columns.

	Hired CEOs			Outgoing CEOs			Difference test	
	<i>N</i>	mean	median	<i>N</i>	mean	median	T-test (p-value)	Wilcoxon test (p-value)
A: Internally promoted CEOs								
<i>All sample:</i>								
Total compensation	106	1,597	863	121	2,374	901	0.016	0.022
Proportion cash pay	106	0.72	0.94	121	0.71	0.96	0.712	0.950
<i>Before bankruptcy:</i>								
Total compensation	69	1,760	828	65	2,906	1,101	0.046	0.021
Proportion cash pay	69	0.64	0.71	65	0.64	0.79	0.702	0.581
<i>During bankruptcy:</i>								
Total compensation	37	1,293	914	56	1,756	772	0.171	0.456
Proportion cash pay	37	0.87	1.00	56	0.80	1.00	0.252	0.502
A: Externally hired CEOs								
<i>All sample:</i>								
Total compensation	144	3,803	1,194	167	2,621	1,055	0.066	0.206
Proportion cash pay	144	0.59	0.68	167	0.69	0.93	0.048	0.047
<i>Before bankruptcy:</i>								
Total compensation	80	4,316	1,093	77	2,629	1,092	0.081	0.263
Proportion cash pay	80	0.51	0.34	77	0.66	0.80	0.018	0.014
<i>During bankruptcy:</i>								
Total compensation	64	3,163	1,322	90	2,615	1,021	0.394	0.549
Proportion cash pay	64	0.69	1.00	90	0.71	1.00	0.729	0.836

Table 5
Subsequent employment of departed CEOs

The table shows the frequency distribution of different types of new employment for 462 CEOs that leave their position between year -2 and Emergence+1 (0 is the filing year) at 342 large public firms filing for US Chapter 11 in 1996-2007. Panel A shows average CEO characteristics by type of employment. The frequency distribution of new employment types is split by year of departure in Panel B, by forced vs. voluntary departure in Panel C, and by incumbent and turnaround CEOs in Panel D. Panel E shows characteristics of 187 firms that employ departed CEOs. All variables are defined in Appendix Table 1. The p-value is from a Wilcoxon test.

Type of new job:	All Departed CEOs	Full-time executive or Chairman	Stay as Chairman	Full-time executive employment:				No new executive employment		
				public firm	private firm	CEO	Non-CEO public firm	private firm	Consultant or politician	Self-employed
Number of cases	462	220	33	29	68	49	41	19	26	197
A: Average characteristics of the departing CEO										
Age	55	54	57	54	53	53	53	58	57	56
Tenure (in years)	5.9	5.4	7.0	4.4	5.4	4.6	5.9	4.9	8.1	6.3
Time to new job (years)	1.0	1.1	0.0	1.3	1.4	1.2	1.2	1.1	1.3	-
B: Post-departure employment by relative year of departure										
Before bankruptcy	149	72	18	7	16	20	11	6	7	64
During bankruptcy	267	126	13	19	42	24	28	11	16	114
After emergence	46	22	2	3	10	5	2	2	3	19
C: Post-departure employment by forced vs. voluntary departure										
Forced	238	94	3	15	42	19	15	7	17	120
Voluntary	224	126	30	14	26	30	26	12	9	77
D: Post-departure employment by incumbent vs. turnaround CEOs										
Incumbent CEOs	338	155	27	20	46	30	32	10	19	154
Turnaround CEOs	124	65	6	9	22	19	9	9	7	43
E: Industry and median sales of firms that employ departed CEOs										
Percent new firms in the same 2-digit industry as the sample firm		30	-	38	28	27	32	-	-	-
Sales of sample firms (\$ million)		1,097	-	1,003	866	1,681	877	-	-	-
Sales of new firms (\$ million)		615	-	623	121	1,873	250	-	-	-
p-value of difference in median sales		0.394	-	0.391	0.006	0.291	0.028	-	-	-

Table 6
Severance paid to departed CEOs

The table shows the severance payment in thousands of constant 2009 dollars by the year of CEO departure relative to bankruptcy (Panel A), forced vs. voluntary turnover (Panel B), incumbent vs. turnaround CEOs, and type of new employment (Panel D), respectively. The mean and median severance pay is conditional on receiving severance. Columns nine and eleven show the severance payment in percent of the CEO's compensation at the bankrupt firm. The sample is 462 CEOs who leave their position in year -2 (0 is the filing year) through Emergence+1 at 342 large public US firms filing for Chapter 11 in 1996-2007. All variables are defined in Appendix Table 1.

	N	% CEOs receiving severance	Contractual severance		Discretionary severance		Total severance			
			mean	median	mean	median	mean	%	median	%
All departed CEOs	462	27	1,718	539	1,877	393	3,595	591	1,592	330
A: Severance paid by year of departure relative to bankruptcy filing										
Before bankruptcy (-2 and -1)	149	32	1,146	311	950	391	2,096	366	1,526	339
During bankruptcy (0 through resolution)	267	22	2,202	824	2,614	368	4,816	784	1,767	338
After emergence (Emergence+1)	46	41	1,658	894	1,917	429	3,574	571	1,740	225
B: Severance paid by forced vs. voluntary turnover										
Forced	238	31	1,948	735	2,266	401	4,215	674	1,784	345
Voluntary	224	24	1,389	395	1,318	314	2,708	474	1,539	244
C: Severance paid by incumbent vs. turnaround CEOs										
Incumbent CEOs	338	28	1,633	449	2,211	478	3,844	605	1,766	330
Turnaround CEOs	124	26	1,963	910	915	6	2,878	551	1,290	252
D: Severance paid by type of new employment										
Stay as Chairman	35	0	0	0	0	0	0	0	0	0
Executive employment	187	34	2,281	824	1,418	313	3,699	679	2,186	345
No new executive employment	242	26	1,191	344	2,306	463	3,497	509	1,511	278

Table 7
CEO total compensation change and present value of income change

The table shows estimates of the change in CEO total compensation in thousands of constant 2009 dollars and percent, split by reason for turnover (Panel A), type of new employment (Panel B), year of departure (Panel C), CEO age (Panel D), CEO tenure (Panel E), incumbent vs. turnaround CEOs (Panel F), and Chapter 11 outcome (Panel G). Income change is the difference in total compensation at the "new" firm (see Table 2) and at the "old" firm in year -3 or the year the CEO joined, if later (0 is the year of filing). PV income change is the present value of the income change discounted at a 10% rate until age 65, adjusted for severance and the time to new employment. "mult." is the ratio of PV income change and the CEO's total pay at the distressed firm. The sample is 105 CEOs that remain one year after emergence and 398 CEOs that leave their position at 342 large public firms filing for US Chapter 11 bankruptcy in 1996-2007. We eliminate cases (i) where the pre-turnover total pay is missing or zero and (ii) in the top ten percentile in % income change.

	N	Income change				PV income change				
		Mean		Median		Mean		Median		
		\$	%	\$	%	\$	mult.	\$	mult.	
All	503	-2,610	-23	-632	-77	-15,817	-0.9	-2,660	-2.7	
A: Income change by type of subsequent employment										
Exec. position or stay as CEO/Chairman	282	-1,716	29	-98	-10	-11,729	1.6	-43	-0.1	
No new executive employment	221	-3,750	-90	-1,101	-100	-20,998	-4.1	-4,170	-4.7	
B: Income change by reason for departure										
Retain CEO position	105	-965	43	126	14	-6,555	2.6	196	0.2	
Voluntary turnover	180	-1,910	-30	-624	-84	-7,905	-0.6	-2,194	-2.1	
Exec. position or stay as Chairman	97	-1,618	25	-187	-19	-8,721	1.8	-50	0.0	
Forced turnover	218	-3,980	-50	-944	-100	-26,757	-2.9	-5,506	-4.9	
Exec. position or stay as Chairman	80	-2,821	14	-556	-47	-22,241	0.2	-3,583	-3.1	
C: Income change by CEO departure year relative to Chapter 11 filing										
Before filing (-2 and -1)	131	-2,334	-35	-725	-92	-13,448	-1.3	-3,033	-3.3	
During bankruptcy (0 through resolution)	332	-2,895	-16	-620	-71	-17,890	-0.6	-2,584	-2.4	
After emergence (Emergence+1)	40	-1,146	-44	-617	-90	-6,390	-2.3	-2,508	-3.2	
D: Income change by CEO tenure at departure										
CEO tenure \leq 3 years	173	-1,984	-14	-485	-72	-13,279	-0.6	-2,467	-2.6	
CEO tenure of 4-6 years	151	-2,631	-21	-620	-76	-16,240	-0.8	-2,925	-3.5	
CEO tenure \geq 6 years	175	-3,261	-34	-933	-86	-18,196	-1.3	-2,777	-2.5	
E: Income change by CEO age at departure										
Less than 50 years old	127	-3,358	-7	-725	-72	-29,704	-0.6	-5,880	-6.3	
51-60 years old	248	-2,475	-25	-625	-79	-14,027	-1.2	-3,188	-3.8	
More than 60 years old	120	-2,255	-40	-632	-86	-4,775	-0.6	0	0	
F: Income change by incumbent vs. turnaround CEOs										
Incumbent CEOs	363	-2,582	-31	-714	-86	-14,873	-1.3	-2,900	-3.0	
Exec. position or stay as CEO/Chairman	185	-1,368	27	-116	-12	-9,214	1.5	-91	-0.1	
Turnaround CEOs	140	-2,682	-5	-451	-56	-18,239	0.1	-2,093	-2.3	
Exec. position or stay as CEO/Chairman	97	-2,380	32	-26	-7	-16,344	2.0	-43	-0.1	
G: Income change by Chapter 11 outcome										
Emergence	337	-2,522	-12	-616	-67	-14,599	-0.2	-2,349	-2.2	
Acquisition	54	-2,362	-46	-681	-93	-10,344	-1.9	-2,963	-3.8	
Liquidation	112	-2,992	-46	-664	-97	-22,158	-2.8	-3,598	-4.7	

Table 8
Determinants of the rehiring probability and the CEO compensation change

Model (1) is a logit regression, where $y=1$ if the departed CEO finds new full-time executive employment or stays as Chairman and $y=0$ if he finds no new executive employment. Models (2) and (3) are ordinary least squares (OLS) regressions for the departed CEO's income change and PV income change, respectively. The income change for departed CEOs is the difference in total compensation at the "new" firm (see Table 2) and at the sample firm (in year -3 or the year the CEO joined, if later, where 0 is the year of filing). Models (4) and (5) are OLS regressions for the income change and PV income change, respectively, of CEOs that stay with the sample firm for another year. The income change for staying CEOs is the change in total compensation through the next year. PV income change is the present value of the income change discounted at a 10% rate until age 65, adjusted for severance and the time to new employment. The sample in Models (1)-(3) is 430 CEOs leaving their position with the sample firm in year -2 through Emergence+1. In models (4) and (5), the sample is 782 CEO-years where the CEO retains his position through the next year. The sample firms are 342 large public firms filing for US Chapter 11 bankruptcy in 1996-2007. Standard errors are in brackets. ***, **, and * denotes significance at the 1%, 5% and 10% level, respectively. All variables are defined in Appendix Table 1.

Dependent variable:	Departed CEOs:			Staying CEOs:	
	(1) Find exec. employment	(2) Income change	(3) PV income change	(4) Income change	(5) PV income change
Intercept	2.619*** [0.815]	-4.811* [3.197]	-79.389*** [20.897]	-0.779 [1.660]	-15.777 [11.405]
<i>Relative years:</i>					
Before	-1.358* [0.783]	-3.459 [2.869]	-18.861 [18.657]	-7.561*** [1.401]	-57.415*** [9.634]
During	0.153 [0.366]	-2.639* [1.426]	-11.518 [9.271]	1.084 [0.866]	3.534 [5.953]
<i>CEO characteristics:</i>					
Age	-0.043*** [0.013]	0.082 [0.051]	1.367*** [0.333]	0.030 [0.028]	0.427** [0.193]
Tenure	-0.025 [0.026]	-0.241** [0.096]	-1.421** [0.622]	-0.010 [0.048]	-0.135 [0.330]
Chairman	0.209 [0.213]	-1.765** [0.820]	-10.760** [5.353]	-0.850* [0.461]	-6.190* [3.172]
Incumbent	-0.496* [0.286]	1.685 [1.114]	11.297 [7.267]	-0.703 [0.763]	-2.899 [5.247]
Before×Incumbent	1.555** [0.772]	2.147 [2.810]	13.237 [18.281]	7.156*** [1.401]	51.929*** [9.634]
<i>Industry condition:</i>					
IndDistress	-0.297 [0.309]	-2.559** [1.224]	-22.504*** [8.053]	-1.121* [0.649]	-6.543 [4.464]
<i>Bankruptcy outcome:</i>					
Prepack	0.140 [0.236]	0.791 [0.915]	4.957 [5.953]	0.177 [0.476]	1.594 [3.275]
Liquidation	-0.357 [0.300]	1.267 [1.139]	2.003 [7.404]	-1.172 [1.607]	-5.522 [11.050]
Acquisition	-0.077 [0.390]	1.352 [1.471]	12.909 [9.775]	-1.113 [1.549]	-5.603 [10.646]
N	430	388	385	782	782
Pseudo R^2 / Adjusted R^2	0.040	0.068	0.103	0.067	0.076

Table 9
Determinants of the probability of forced and voluntary turnover

The table shows coefficient estimates from multinomial logit regressions for the probability of CEO turnover. The sample is 1,347 firm-years from year -2 through Emergence+1 for 342 public firms filing for US Chapter 11 bankruptcy in 1996-2007. All models have three outcomes: voluntary turnover (N=147), forced turnover (N=152), and no turnover (N=1,048). The CEO expected bankruptcy costs are the predicted values from regressions (1)-(5) in Table 8. All regressions control for industry fixed effects at the two-digit level. Standard errors are in brackets. ***, **, and * denotes significance at the 1%, 5% and 10% level, respectively. All variables are defined in Appendix Table 1.

	(1)		(2)		(3)	
	Voluntary	Forced	Voluntary	Forced	Voluntary	Forced
Intercept	-29.371*** [1.630]	-1.429 [1.792]	-24.535*** [1.468]	0.010 [1.872]	-24.648*** [1.488]	0.084 [1.885]
<i>CEO expected bankruptcy costs:</i>						
Predicted probability of maintaining full-time executive employment			-3.057*** [0.944]	-2.655*** [0.959]	-2.703*** [1.035]	-2.986*** [1.032]
Predicted income change of departing vs. staying			0.033 [0.047]	-0.099** [0.048]		
Predicted PV income change of departing vs. staying					0.008 [0.008]	-0.013* [0.008]
<i>Year relative to filing:</i>						
Before	-0.466 [0.360]	-0.694* [0.402]				
During	-0.166 [0.351]	0.569 [0.380]				
<i>CEO characteristics:</i>						
Age	0.064*** [0.014]	-0.002 [0.014]				
Tenure	-0.013 [0.027]	0.025 [0.026]				
Chairman	-0.548** [0.216]	-0.280 [0.225]				
Incumbent	0.583** [0.296]	0.790*** [0.291]				
Ownpct	-0.035** [0.014]	-0.007 [0.009]	-0.039*** [0.013]	-0.011 [0.009]	-0.039*** [0.013]	-0.010 [0.009]
<i>Firm characteristics:</i>						
Size	0.118 [0.091]	0.053 [0.079]	0.099 [0.087]	0.035 [0.075]	0.103 [0.087]	0.043 [0.075]
Industry adjusted ROA	-1.735** [0.870]	-2.303*** [0.817]	-1.489* [0.860]	-2.400*** [0.783]	-1.557* [0.863]	-2.371*** [0.786]
Industry adjusted leverage	0.036 [0.253]	0.232 [0.215]	0.185 [0.233]	0.423** [0.202]	0.184 [0.233]	0.448** [0.199]
Tangibility	0.387 [0.610]	-0.257 [0.615]	0.378 [0.601]	-0.344 [0.607]	0.410 [0.602]	-0.354 [0.608]
IndDistress	-0.034 [0.327]	-0.738* [0.395]				
Prepack	0.556** [0.241]	0.081 [0.235]				
Institution \geq 25%	0.015 [0.214]	-0.555** [0.225]	-0.088 [0.207]	-0.589*** [0.217]	-0.093 [0.207]	-0.595*** [0.217]
DIP Financing	0.527** [0.226]	0.574** [0.229]	0.449** [0.220]	0.556** [0.228]	0.442** [0.220]	0.568** [0.227]
Bond debt \geq 70% of liabilities	0.274 [0.321]	-0.420 [0.332]	0.302 [0.315]	-0.311 [0.327]	0.295 [0.315]	-0.314 [0.327]
Trade debt \geq 70% of liabilities	-0.398 [0.270]	-0.712*** [0.272]	-0.299 [0.264]	-0.701*** [0.269]	-0.302 [0.263]	-0.672** [0.267]
Pseudo R^2	0.136 47		0.107		0.107	

Table 10
Determinants of the CEO's compensation package

The table shows ordinary least squares (OLS) regressions for the logarithm of CEO total compensation (Models 1-3) and for the proportion cash pay of total compensation (Models 4-6) at the distressed firm. The sample is 1,266 firm-years from year -2 through Emergence+1 for 342 public firms filing for US Chapter 11 bankruptcy in 1996-2007. The CEO expected bankruptcy costs are the predicted values from regressions (1) through (5) in Table 8. *Incumbent CEOs: departed* is a dummy variable that equals one for all CEO-years of incumbent CEOs that depart during the sample period. *Turnaround CEOs: internal* is a dummy variable that equals one for all CEO-years of turnaround CEOs promoted internally. *Turnaround CEOs: external* is a dummy variable that equals one for all CEO-years of turnaround CEOs hired externally. All regressions control for industry fixed effects at the two-digit level. Standard errors are in brackets. ***, **, and * denotes significance at the 1%, 5% and 10% level, respectively. All other variables are defined in Appendix Table 1.

	CEO total compensation			Proportion cash pay		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	7.817*** [1.156]	5.437*** [1.163]	5.439*** [1.169]	0.667*** [0.257]	0.950*** [0.259]	0.989*** [0.261]
<i>CEO expected bankruptcy costs:</i>						
Predicted probability of being rehired		1.454*** [0.431]	1.493*** [0.493]		-0.243** [0.096]	-0.360*** [0.110]
Predicted income change of departing vs. staying		0.022 [0.022]			-0.023*** [0.005]	
Predicted PV income change of departing vs. staying			0.002 [0.004]			-0.004*** [0.001]
<i>Relative years:</i>						
Before	-0.690*** [0.188]			0.048 [0.042]		
During	-0.668*** [0.187]			0.223*** [0.042]		
<i>CEO characteristics:</i>						
Age	-0.020*** [0.006]			0.003** [0.001]		
Tenure	-0.013 [0.011]			0.000 [0.002]		
Chairman	0.065 [0.100]			-0.036 [0.022]		
Incumbent CEOs: departed	-0.070 [0.133]	-0.083 [0.130]	-0.082 [0.130]	-0.030 [0.029]	-0.039 [0.029]	-0.036 [0.029]
Turnaround CEOs: internal	-0.808*** [0.245]	-0.676*** [0.234]	-0.685*** [0.234]	-0.078 [0.054]	-0.036 [0.052]	-0.028 [0.052]
Turnaround CEOs: external	-0.291* [0.164]	-0.109 [0.153]	-0.113 [0.154]	-0.107*** [0.036]	-0.086** [0.034]	-0.077** [0.034]
Ownpct	-0.021*** [0.004]	-0.020*** [0.004]	-0.021*** [0.004]	0.003*** [0.001]	0.001 [0.001]	0.001 [0.001]
<i>Firm characteristics:</i>						
Size	0.231*** [0.034]	0.239*** [0.034]	0.236*** [0.034]	-0.017** [0.008]	-0.020*** [0.008]	-0.019** [0.008]
Industry adjusted ROA	0.754* [0.413]	0.764* [0.416]	0.776* [0.416]	-0.058 [0.092]	-0.099 [0.093]	-0.102 [0.093]
Industry adjusted leverage	-0.155 [0.116]	-0.233** [0.112]	-0.241** [0.112]	0.035 [0.026]	0.076*** [0.025]	0.082*** [0.025]
Tangibility	-0.553** [0.276]	-0.631** [0.278]	-0.634** [0.278]	-0.015 [0.061]	0.010 [0.062]	0.007 [0.062]
IndDistress	-0.360** [0.155]			0.094*** [0.034]		
Prepack	-0.464*** [0.105]			0.053** [0.023]		
Adjusted R ²	0.152	0.129	0.129	0.132	0.104	0.101

Appendix Table 1: Variable definitions, sources, and mean and median values

This table shows the definition and source for all variables used in the study. The sample is 342 large US public firms filing for bankruptcy in 1996-2007 and resolved by 2011. The mean and median values are from the last fiscal year before Chapter 11 filing and in constant 2009 US dollars. Potentially unbounded variables are winsorized at the 1% and 99% level. The table uses "BRD" for Bankruptcy Research Database and "BD" for BankruptcyData.com. Bankruptcy plans are obtained from BD, 8Ks, and various US Bankruptcy Courts. The 10Ks, 8Ks, and proxy statements are from EDGAR and 13Fs are from Thompson Reuters Ownership Database. CEO characteristics are based on the last fiscal year before Chapter 11 filing.

Variable name	Variable definition	Source	Mean	Median
A. Firm and Chapter 11 Characteristics				
Assets	Book value of total assets (in \$ millions).	BRD, BD, Compustat	3,278	798
Sales	Total sales (in \$ millions).	BRD, BD, Compustat	2,912	739
Size	Logarithm of total sales (in \$ millions).	BRD, BD, Compustat		
ROA	Ratio of EBITDA to book value of total assets.	Compustat, 10Ks	0.009	0.039
Industry adjusted ROA	ROA adjusted by the median firm in the same 2-digit SIC industry.	Compustat, 10Ks	-0.081	-0.058
Leverage	Ratio of total liabilities to book value of total assets.	Compustat, 10Ks	1.044	0.953
Industry adjusted leverage	Leverage adjusted by the median firm in the same 2-digit SIC industry.	Compustat, 10Ks	0.483	0.393
Tangibility	Ratio of net PP&E to book value of total assets.	Compustat, 10Ks	0.377	0.354
IndDistress	Indicator variable taking the value of one if the median stock return in the two-digit SIC industry is less than -30% in a given year.	Compustat	0.135	0
Institution (%)	Percent shares owned by institutional investors.	13Fs	24.4	17.6
Bond debt/liabilities	Ratio of the face value of bonds outstanding to total liabilities.	Bankruptcy Plans, Compustat, CapIQ	0.393	0.381
Trade debt/liabilities	Ratio of total liabilities less bank loans and bonds to total liabilities.	Bankruptcy Plans, Compustat, CapIQ	0.346	0.284
DIP Financing	Indicator variable taking the value of one if debtor-in-possession (DIP) financing is provided by prepetition lenders.	BRD, BD, Bankruptcy Plans, Factiva, LexisNexis	0.515	1
Prepack	Indicator variable taking the value of one if the bankruptcy is prepackaged or pre-negotiated.	BRD, BD, Bankruptcy Plans	0.304	0
Emergence	Indicator variable taking the value of one if the firm subsequently emerges from bankruptcy as an independent entity.	BRD, BD, Bankruptcy Plans	0.640	1
Acquisition	Indicator variable taking the value of one if the firm is acquired in bankruptcy.	BRD, BD, Bankruptcy Plans	0.102	0
Liquidation	Indicator variable taking the value of one if the firm is liquidated in bankruptcy or the case is converted to Chapter 7 of the U.S. Bankruptcy Code.	BRD, BD, Bankruptcy Plans	0.257	0

Appendix Table 1 continued from previous page

Variable name	Variable definition	Source	Mean	Median
Duration	Number of months in bankruptcy, from the date of filing to the date of confirmation of the reorganization plan.	BRD, BD, Bankruptcy Plans	16.562	12.650
B. CEO Characteristics				
Tenure	CEO tenure with the sample firm in years.	Execucomp, 10Ks, Proxy Statements	4.840	3
Age	CEO age in years.	Execucomp, 10Ks, Proxy Statements	52.839	53
Chairman	Indicator variable taking the value of one if the CEO is Chairman of the board.	Execucomp, 10Ks, Proxy Statements	0.579	1
Ownpct	Percent of common shares owned by the CEO.	Execucomp, 10Ks, Proxy Statements	6.898	1.495
Equity grants	Total value of restricted stock and options granted (in \$ thousands).	Execucomp, 10Ks, Proxy Statements	1,209	23
CEO total compensation	Sum of salary, bonus and grants (in \$ thousands).	Execucomp, 10Ks, Proxy Statements	2,092	866
PV Income change	The present value of the change in total compensation, using a 10% discount rate, adjusted for severance pay and the time it takes to find new employment, assuming that the CEO will earn the new level of compensation until age 65 and zero thereafter.			
Proportion cash pay	Fraction of salary and bonus (vs. equity grants) of total compensation.	Execucomp, 10Ks, Proxy Statements	0.722	0.923
Incumbent CEO	A CEO in place at the beginning of fiscal year -2 relatively to filing (N=338), or internally promoted to CEO in year -2 (N=30) or -1 (N=40).	10Ks, Proxy Statements, Factiva		
Turnaround CEO	A CEO hired in the year of bankruptcy filing through one year after emergence (N=225), or hired externally in year -2 and -1 (N=83).			
Forced turnover	(1) The turnover is performance-related or follows pressure by the board, shareholders or creditors; or (2) the CEO resigns for personal reasons, to pursue other interests or, if no reason is given, the CEO is not employed by another company within a year; or (3) the firm is liquidated or acquired in bankruptcy and the departing CEO is less than 60 years old.	Factiva, 10Ks, Proxy Statements		

Appendix Table 2

Methodology for estimating CEO compensation at new employment

The table describes the methodology used to estimate the departed CEO's income at his subsequent employment. An industry-size match is a firm in ExecuComp in the same two-digit SIC industry and closest in sales, assets or employees, whichever is available for the new firm.

Type of new employment	Methodology for estimating income at the new firm
Retain CEO position at restructured firm	The actual CEO pay in ExecuComp in or, if unavailable, the CEO pay for an industry-size matched firm in ExecuComp in year Emergence+1
Stay as Chairman of sample firm	The actual non-CEO Chairman pay in ExecuComp or, if unavailable, the non-CEO Chairman pay of the median firm in sales in the two-digit SIC industry in the first year as Chairman only.
<i>Full-time executive position:</i>	
CEO at a public firm	The actual CEO pay in ExecuComp or, if unavailable, the CEO pay for an industry-size matched firm in ExecuComp in the first year at the new firm.
CEO at a private firm	The CEO pay for an industry-size matched firm in ExecuComp in the first year at the new firm, adjusted with a 30% private firm discount following Gao, Lemmon, and Li (2011). ^a
Non-CEO executive at a public firm	The average top non-CEO executive pay for the actual firm in ExecuComp or, if unavailable, for an industry-size matched firm in ExecuComp in the first year at the new firm.
Non-CEO executive at a private firm	The top non-CEO executive pay for an industry-size matched firm in ExecuComp in the first year at the new firm, adjusted with a 30% private firm discount following Gao, Lemmon, and Li (2011). ^a
<i>No new executive position:</i>	
Consultant or politician	A total pay of \$300,000 in 1995 dollars. This is the typical consulting contract offered to departed CEOs and the average salary paid to principals at McKinsey over the sample period.
Self-employed	The median pay for companies in the bottom decile of ExecuComp firms in number of employees, in the same one-digit SIC industry as the sample firm and in the first year the CEO is self-employed.
No new employment	An income of zero.

^a The private firm pay adjustment following Gao, Lemmon, and Li (2011) is an average of the coefficients in their Table 6. For the comparison of cash pay in Appendix Table 3, we use a 12% discount.

Appendix Table 3
CEO compensation change by type of subsequent employment

The table shows CEO salary and bonus (Panel A) and total compensation (Panel B) in 2009 US dollars across different employment categories. The income change is the difference in pay at the new firm (defined in Table 2) and the old firm (measured in year -3 or the year the CEO is hired). PV income change estimates the present value of the pay change, assuming that the CEO will receive the new level of pay until age 65, discounted at a 10% rate and adjusted for the time it takes to find new employment. In Panel B, the PV income change includes severance pay received at departure. We report both dollar amount of PV income change and multiple of CEO pay prior to departure. The sample is 105 CEOs in place at year-end one year after emergence and 398 CEOs that leave their position with the sample firm in year -2 through one year after emergence at 342 large public firms filing for US Chapter 11 bankruptcy in 1996-2007. We drop observations where the pre-turnover total pay is missing or zero, and observations in the top ten percentile in percentage change of total compensation. The p-value shows the significance of the mean/median dollar change in income change being different from zero.

	N	Pay at old firm in \$				Pay at new firm in \$				Income change				PV income change			
		mean		median		mean		median		Mean		Median		Mean		Median	
		\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
A: CEO salary and bonus (in \$ thousands)																	
Retain CEO position	105	1,209	684	1,203	854	-5	69	0.97	64	10	0.33	-412	4.0	41	0.1		
Stay as Chairman	29	815	824	824	644	9	30	0.96	-149	-41	0.38	762	2.9	0	0.0		
CEO at public firm	18	1,347	841	1,054	668	-393	23	0.37	-106	-14	0.53	-4,585	0.3	-2,273	-2.5		
CEO at private firm	54	1,632	911	810	567	-822	45	0.04	-252	-35	0.00	-6,303	3.3	-2,126	-2.7		
Non-CEO exec. at public co.	39	919	788	654	527	-265	-8	0.03	-136	-19	0.04	-2,235	-1.3	-1,760	-1.7		
Non-CEO exec. at private co.	37	1,284	841	761	318	-523	-13	0.27	-308	-47	0.00	-4,152	-0.9	-2,251	-3.1		
Consultant or politician	16	1,236	779	346	344	-890	-37	0.01	-443	-56	0.00	-4,977	-2.2	-2,207	-3.3		
Self-employed	20	1,101	761	384	353	-717	-35	0.02	-343	-45	0.00	-3,969	-2.4	-1,873	-2.9		
Retain honorary position	44	891	587	0	0	-891	-100	0.00	-587	-100	0.00	-4,390	-5.0	-3,041	-4.9		
No new employment	141	1,192	671	0	0	-1,192	-100	0.00	-671	-100	0.00	-5,909	-5.0	-3,217	-5.3		
All	503	1,183	743	556	339	-627	-19	0.00	-400	-65	0.00	-3,712	-0.8	-1,932	-3.0		
B: CEO total pay (in \$ thousands)																	
Retain CEO position	105	3,792	1,444	2,827	1,307	-965	43	0.06	126	14	0.99	-6,556	2.6	196	0.2		
Stay as Chairman	29	4,383	1,069	1,686	930	-2,697	50	0.22	-29	-3	0.89	-14,064	3.3	0	0.0		
CEO at public firm	18	4,185	1,737	2,027	1,074	-2,158	36	0.26	183	48	0.84	-27,014	0.5	-43	-0.1		
CEO at private firm	54	4,511	1,643	1,842	1,192	-2,669	8	0.02	-430	-46	0.01	-16,733	0.3	-2,898	-2.4		
Non-CEO exec. at public co.	39	3,288	1,784	2,070	1,252	-1,218	23	0.20	-615	-33	0.09	-6,941	1.8	-3,487	-2.4		
Non-CEO exec. at private co.	37	3,588	983	1,593	615	-1,996	3	0.13	-310	-47	0.21	-15,481	-0.1	-3,035	-2.6		
Consultant or politician	16	2,975	991	346	344	-2,629	-52	0.04	-650	-67	0.00	-12,391	-3.3	-4,239	-3.9		
Self-employed	20	6,108	2,221	712	708	-5,396	-26	0.02	-1,485	-67	0.00	-35,717	-0.5	-3,994	-0.9		
Retain honorary position	44	2,447	1,063	0	0	-2,447	-100	0.00	-1,063	-100	0.00	-11,167	-4.2	-3,856	-4.6		
No new employment	141	4,051	1,107	0	0	-4,051	-100	0.00	-1,107	-100	0.00	-22,951	-4.7	-4,379	-4.9		
All	503	3,884	1,297	1,274	411	-2,610	-23	0.00	-632	-77	0.00	-15,817	-0.9	-2,660	-2.7		

Appendix Table 4

CEO income change by incumbent vs. turnaround CEOs, and forced vs. voluntary departure

The table shows estimates of the change in CEO total compensation in \$ thousands and percent. Panel A splits the sample by incumbents and turnaround CEOs. Panel B splits the sample by forced or voluntary turnover. Income change is the difference in total compensation at the new firm (defined in Table 2) and the old firm (measured in year -3 or the year the CEO is hired). PV income change estimates the present value of the income change, assuming that the CEO will receive the new level of pay until age 65, discounted at a 10% rate, adjusted for the time it takes to find new employment, and including severance pay received at departure. The sample is 105 CEOs in place at year-end one year after emergence and 398 CEOs that leave their position with the sample firm in year -2 through one year after emergence at 342 large public firms filing for US Chapter 11 bankruptcy in 1996-2007. We drop observations where the pre-turnover total pay is missing or zero, and observations in the top ten percentile in percentage change of total compensation.

	N	Change in total compensation				PV income loss			
		mean		median		mean		median	
		\$	%	\$	%	\$	multiple	\$	multiple
A: Incumbent CEOs vs. turnaround CEOs									
Incumbent CEOs									
Retain CEO position	53	-763	39	190	19	-3,202	2.6	196	0.3
Stay as Chairman	24	-790	62	-2	-1	-8,156	3.8	0	0.0
CEO at public firm	13	-960	44	304	66	-16,925	1.0	1,027	1.3
CEO at private firm	39	-2,313	19	-187	-28	-13,097	0.7	-2,508	-1.5
Non-CEO exec. at public co.	26	-1,528	26	-617	-38	-8,288	1.9	-4,583	-3.0
Non-CEO exec. at private co.	30	-1,706	-20	-480	-49	-13,888	-1.9	-4,203	-3.0
<i>All stay or executive empl.</i>	185	-1,368	27	-116	-12	-9,214	1.5	-91	-0.1
No new executive employment	178	-3,844	-90	-1,124	-100	-20,596	-4.1	-4,265	-4.8
Turnaround CEOs									
Retain CEO position	52	-1,172	46	112	10	-9,974	2.6	156	0.1
Stay as Chairman	5	-11,853	-8	-720	-87	-42,423	0.9	0	0.0
CEO at public firm	5	-5,273	17	23	38	-51,226	-0.7	-43	-0.1
CEO at private firm	15	-3,594	-21	-462	-59	-25,945	-0.7	-2,898	-3.6
Non-CEO exec. at public co.	13	-597	19	-455	-19	-4,455	1.6	-2,378	-1.7
Non-CEO exec. at private co.	7	-3,238	103	1,572	145	-21,626	6.9	11,104	12.1
<i>All stay or executive empl.</i>	97	-2,380	32	-26	-7	-16,344	2.0	-43	-0.1
No new executive employment	43	-3,361	-89	-662	-100	-22,722	-4.4	-3,842	-4.4
B: Forced departure vs. voluntary departure									
Forced turnover									
Stay as Chairman	3	-1,144	73	995	133	-8,429	5.9	7,786	12.0
CEO at public firm	12	-3,917	21	-880	-32	-40,673	-0.8	-8,703	-2.6
CEO at private firm	35	-3,304	8	-767	-59	-23,385	-0.4	-6,806	-3.6
Non-CEO exec. at public co.	17	-1,981	-10	-620	-62	-16,729	-1.3	-5,805	-4.5
Non-CEO exec. at private co.	13	-1,993	40	-30	-4	-11,695	3.1	819	3.0
<i>All stay or executive empl.</i>	80	-2,821	14	-556	-47	-22,241	0.2	-3,583	-3.1
No new executive employment	138	-4,652	-87	-1,258	-100	-29,348	-4.7	-5,565	-5.4
Voluntary turnover									
Stay as Chairman	26	-2,876	47	-34	-7	-14,715	3.0	0	0.0
CEO at public firm	6	1,359	66	444	67	5,769	3.5	2,430	4.3
CEO at private firm	19	-1,500	8	-187	-16	-3,799	1.5	-150	-0.2
Non-CEO exec. at public co.	22	-628	50	-303	-15	-268	3.9	-1,715	-1.1
Non-CEO exec. at private co.	24	-1,998	-17	-480	-54	-17,825	-2.0	-4,882	-3.0
<i>All stay or executive empl.</i>	97	-1,618	25	-187	-19	-8,721	1.8	-50	0.0
No new executive employment	83	-2,252	-94	-752	-100	-6,978	-3.2	-2,580	-3.2