

# How costly is corporate bankruptcy for top executives?\*

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## **Abstract**

We examine CEO career and human capital changes around Chapter 11 bankruptcy filings for a large sample of publicly traded firms. One-third of the incumbent CEOs and half of all sample CEOs maintain full-time executive employment despite bankruptcy filing. For these CEOs, we estimate the median change in CEO human capital to be zero. CEOs who do not maintain full-time executive employment experience a median estimated loss of human capital equal to five times their pre-departure compensation. While CEO loss of equity investment in the bankrupt firm is large regardless of career changes, greater pre-filing equity holdings are associated with a lower likelihood of voluntary departure. Greater creditor control rights are associated with a higher likelihood of both forced departure and failure to maintain full-time executive employment.

*Key words:* CEO human capital, bankruptcy costs, turnover, career change

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# 1 Introduction

Corporate bankruptcy imposes personal economic costs on the firm's employees, ranging from forced retraining and relocation expenses following departure to loss of employment income (human capital) and equity investment value. The existence of personal bankruptcy costs for the distressed firm's top executives is of particular interest to corporate finance research since these costs may create an incentive to undertake costly hedging activities (a form of agency costs of debt).<sup>1</sup> However, systematic empirical evidence on the magnitude of executives' personal bankruptcy costs is sparse (Hotchkiss, John, Mooredian, and Thorburn, 2008). In this paper, we analyze employment data from 1993 to 2010, and track employment and compensation changes for chief executive officers (CEOs) of 322 public firms filing for Chapter 11 bankruptcy. We also provide evidence on the sample CEOs' loss of personal equity holdings in the bankrupt companies.

Because bankruptcy filing may be driven by a combination of exogenous risk factors and factors under management control, it is difficult to predict *a priori* how the CEO labor market will respond to a bankruptcy filing. The labor market reaction need not be negative. Although the CEO's failure to restructure the firm in time to avoid bankruptcy in itself sends a negative signal about managerial quality, the experience gained from going through severe financial distress possibly adds to the CEO's skill set. An extensive leadership literature—covering both business and military training—emphasizes the value of experience with actual or simulated crisis situations. In our context, the existence of so-called “turnaround specialists”, who are sometimes serving as replacement CEOs in our sample firms, also suggests that crisis experience has market value. Our empirical evidence reflects the net effect of these opposing labor market considerations for the change in CEO human capital.

Our primary contribution is a novel, longitudinal analysis of CEO employment and income changes around Chapter 11 filings, which allows us to estimate the effect of bankruptcy on CEO human capital. We begin by identifying departing CEOs' new executive employment status. We then either observe or estimate the new employment compensation and use the income change and its present value until a fixed retirement age to measure changes in the value of human capital. With the exception of Eckbo and Thorburn (2003), who document changes in CEO labor income from Swedish tax returns, this type of

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<sup>1</sup>Excessive hedging may take the form of under-investment in risky projects (Eckbo and Thorburn, 2003), excessive cash balances and reliance on internal financing (Bates, Kahle, and Stulz, 2009), and low leverage (Berk, Stanton, and Zechner, 2010; Chemmanur, Cheng, and Zhang, 2013).

longitudinal employment and income change information is largely new to the bankruptcy literature.

A key contribution is our documentation of the sample CEOs' new employment status following departure from the distressed firms. We identify the new employment status through a comprehensive search of traditional data sources (proxy statements, 10-Ks, etc.) as well as news reports (Factiva) and social media (LinkedIn, Wikipedia, Google). We perform this search over a period of three years following the CEO's departure in order to assure accuracy, and we positively identify the new employment status for as much as 83% of the total sample of CEOs.<sup>2</sup> We also confirm that a large fraction of the remaining 17% of CEOs were forced to leave the bankrupt firm, which supports that these CEOs failed to find new employment or simply retired, as our search procedure suggests.

We are particularly interested in the potential human capital loss of the *incumbent* CEO, defined as the CEO in charge of the firm at the fiscal year-end three years prior to bankruptcy filing (thus not including internally promoted or externally hired replacement CEOs after year -3). Since our sample firms are typically already in severe financial distress two years prior to bankruptcy filing, incumbent CEOs are likely to be viewed by the labor market as the executives primarily responsible for the firm's demise.

We present several interesting empirical findings. First, despite the poor performance of the firms under their reign, nearly two-thirds of the incumbents continue in some form of employment, and one-third continue as full-time executives.<sup>3</sup> Of the incumbent CEOs maintaining full-time executive positions, half remain with the restructured firm emerging from bankruptcy, while the other half depart to other public or private companies.

The CEOs who do not continue in full-time executive positions either retire or assume a wide range of non-executive professional activities and responsibilities after departure. The most common new responsibility is as non-executive director which is similar to the findings of Brickley, Linck, and Coles (1999) on retiring CEOs outside of bankruptcy. Several departing CEOs receive an honorary board position with the restructured firm. Half of the incumbent CEOs who do not receive full-time employment appear to retire.<sup>4</sup>

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<sup>2</sup>The 83% success rate is substantially higher than reported by earlier studies tracking CEO career changes (Gilson, 1989; Fee and Hadlock, 2004; Desai, Hogan, and Wilkins, 2006). An important reason for our high success rate is our reliance on the internet and social media.

<sup>3</sup>When including the replacement CEOs, 45% continue in full-time executive employment.

<sup>4</sup>Our retirement classification includes direct evidence of retirement plus CEOs for which we find no employment records of any kind over the three years following departure.

Having identified a departed CEO's new employment category, we either observe directly or estimate total new employment pay and compute changes in compensation. When the departed CEO assumes a full-time executive position in another public firm, the new compensation is observed using ExecuComp and SEC filings. When joining a private company, however, the new income must be estimated. For new full-time executive positions in private companies, we follow the compensation literature and use the executive pay for a public company matched on size and industry (Core, Holthausen, and Larker, 1999; Murphy, 1999; Harford and Li, 2007; Kaplan and Rau, 2010). We then reduce this matched firm compensation by the 20% private-firm compensation discount estimated by Gao, Lemmon, and Li (2011).

We estimate changes in CEO human capital as the present value of the estimated income change until retirement (assumed at an age of 65 years). Perhaps the most important finding of this paper is that *the median incumbent CEOs who continues in full-time executive employment do so with no significant change in compensation and human capital*. Despite their failure to prevent bankruptcy, these incumbent CEOs do not appear to be systematically tainted by the bankruptcy event. It is possible that the incumbent CEOs deemed by the labor market to be qualified to continue in full-time executive positions were particularly competent in handling the bankruptcy crisis. Moreover, many may have gained valuable human capital as a result of the crisis experience. Indeed, our evidence shows that replacement CEOs who maintain full-time executive positions—several of whom are turnaround specialists—fare even better with a slight increase in compensation after bankruptcy.

In stark contrast, for CEOs who fail to find new full-time executive employment the median estimated loss of human capital equals five times their pre-departure total income (a median loss of \$6.5 million in constant 2009 dollars). Moreover, the loss of human capital for incumbent CEOs in this group is statistically indistinguishable from the losses of replacement CEOs. Overall, without conditioning on new employment—pooling CEOs receiving full-time executive employment with those who do not—the median estimated loss of human capital is three times the pre-departure compensation (3.8 times for incumbents and a significantly lower 2.2 times for replacement CEOs).

While the above analysis follows each individual CEO through time, it is also interesting to hold the firm constant and examine how the labor market treats incoming replacement CEOs compared to outgoing CEOs of distressed firms. Much like Gilson and Vetsuypens (1993), we find that internally hired replacement CEOs receive significantly lower compensation than the departing incumbent that they replace (median 25% lower for our total sample). In addition, we show that the median compensation

of externally hired replacement CEOs is similar to that of outgoing incumbents, except in the case of prepackaged bankruptcy filings where the median external hire receives a 40% compensation premium relative to the departed incumbent CEO.<sup>5</sup> Firms that have succeeded in negotiating a prepack tend to have higher going-concern value than firms selecting a regular, non-prepack Chapter 11 filing. This suggests that the post-prepack pay premium in part reflects a greater equilibrium compensation in the restructured firm.

In addition to controls for CEO characteristics (e.g., age, tenure, and incumbent) and firm characteristics (industry-adjusted profitability and leverage, and industry distress), our cross-sectional analysis also includes characteristics indicating creditor control rights in bankruptcy. For example, in a bankruptcy filing involving debtor-in-possession (DIP) financing, creditors are allowed to include control provisions in the DIP contract, some of which may affect CEO turnover (Dahiya, John, Puri, and Ramirez, 2003). We find that DIP financing is associated with greater likelihood of forced CEO turnover, while forced turnover is less likely when the filing firm is heavily financed with trade debt. This suggests that more senior debtholders (who typically provide DIP financing) may have a different view of the value of retaining the incumbent CEO than do junior trade creditors. For example, strong trade creditors may have greater incentive to preserve supplier relationships as suggested by (Hertzel, Li, Officer, and Rodgers, 2008)—perhaps favoring the incumbent CEO. Or, if trade creditors are dispersed, they may have less bargaining power than senior creditors in bankruptcy.

Finally, we document CEOs equity losses over the period leading up to a bankruptcy filing. Three years prior to bankruptcy filing (year -3), the median incumbent CEO holds about \$6 million in stocks which drops to about half that value by year -1 and to zero in the filing year (year 0). Interestingly, we find that the median *percentage* CEO shareownership does not decline over the four-year event period: it starts out at 2% in year -3 and remains at 2% in year 0. Also, incumbent CEO who remains with the company over the event period tend to hold a greater percentage equity ownership stake than those who depart and those who are hired. This is suggestive of the hypothesis that equity compensation helps incentivize incumbent CEOs to stay with the firm. Our cross-sectional analysis further supports this hypothesis as greater CEO percentage share-ownership is associated with a lower probability that the incumbent CEO leaves voluntarily.

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<sup>5</sup>In a “prepack”, the main creditors have typically signed off on a restructuring agreement, which substantially shortens time in bankruptcy and lowers bankruptcy costs (Tashjian, Lease, and McConnell, 1996; Thorburn, 2000).

The rest of the paper is organized as follows. Section 2 describes the sample selection procedure and CEO turnover and compensation statistics. In Section 3, we track the career changes of executives departing from the bankrupt firms. This section also provides our estimates of the CEO income change and loss of human capital. In Section 4 we perform cross-sectional analyses of the determinants of forced and voluntary turnover and of the probability of finding new executive employment. This is followed in Section 5 with a cross-sectional analysis of estimated changes in departed CEOs income and human capital. Section 6 provides evidence on CEO equity losses prior to bankruptcy filing, while Section 7 concludes the paper. Some additional empirical results used in our compensation analysis are contained in the Appendix.

## **2 CEO turnover and compensation at the distressed firms**

### **2.1 Data sources and sample characteristics**

Our sample selection starts with 497 Chapter 11 bankruptcy filings in the 1996 to 2007 period by U.S. firms with book assets above \$100 million (in constant 1980 dollars) from the Bankruptcy Research Database of Professor Lynn LoPucki at UCLA Law School. We require that the firm is publicly traded, that the bankruptcy case is resolved by 2011, and that information on CEO personal characteristics and compensation is available in the fiscal year prior to filing. These restrictions eliminate 175 cases, for a final sample of 322 bankrupt firms.

We follow each sample firm over an event window which starts three fiscal years prior to the year of filing (event year 0). If the firm survives bankruptcy proceedings, the event window ends in the fiscal year after emergence from bankruptcy (event year Emergence+1). Otherwise, the event period for the firm ends with the year of the firm's liquidation or sale to another company during Chapter 11 proceedings. This leads to a total of 1,899 firm-year observations from the period 1993 through 2010.

Moreover, we collect information on each CEO beginning at the end of year -3 and ending three years after the CEO departs the firm or, if the CEO stays and the company survives bankruptcy, until three years after the year of emergence. Our CEO-specific information includes name, chairmanship, age, tenure, stock ownership, and annual compensation. This information, including CEO turnover and appointments throughout the reorganization process, is obtained from ExecuComp or collected manually from SEC filings (proxy statements and 10-K forms) via Edgar. For companies that stop filing with the

SEC after entering bankruptcy, we resort to bankruptcydata.com and Factiva.

CEO annual total compensation include salary, bonus, long-term incentive plans (LTIP), other cash compensation, value of restricted stock awards, and option grants (number of options, exercise price, grant date, maturity date, and value of grant). Cash pay is defined as the sum of salary, bonus, LTIP, and other cash compensation. Equity grants are defined as the total value of restricted stock and options grants in that year, valued at the fiscal year-end stock price and using the Black-Scholes model.<sup>6</sup>

Table 1 shows the annual distribution and characteristics of our sample firms. All variables are defined in Appendix Table 1, and dollar values are in constant 2009 dollars throughout the paper. As expected, the two years following the onset of the market-wide economic decline in 2000 saw a relatively large number of filings. Across the total sample, the average filing firm is quite large, with sales of \$3.1 billion and total assets of \$3.4 billion (median of \$0.8 billion) at the end of the fiscal year prior to filing.

Table 1 further shows that the bankruptcy proceedings last 17 months on average, with a median of 13 months. About half of the cases are resolved within 12 months of filing and 78% are resolved within 24 months. Thirty percent of the bankruptcies are prepacks where the firms have negotiated a reorganization plan with its creditors prior to filing. Prepackaged bankruptcy cases are resolved quicker, with an average time in bankruptcy of only 6 months (median of 4 months) in our sample. The filing firm emerges from Chapter 11 as an independent restructured company in 205 cases (64%), while 85 firms (26%) are liquidated and another 32 firms (10%) are acquired in bankruptcy.<sup>7</sup>

While not shown in the table, the sample firms struggle with severe financial distress in year -1, and many already in year -2, with high leverage and poor operating performance compared to industry peers. For example, the median leverage ratio (defined as total liabilities to total assets) is 82% in year -2 and 95% in year -1 which is significantly higher than for peer companies. Moreover, the industry-adjusted return on assets (ROA, defined as EBITDA to total assets) is -3.5% and -5.8% in years -2 and -1, respectively, which is a significantly lower performance than observed for industry peers.

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<sup>6</sup>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 winsorize the volatility at the 5th percentile and 95th percentile in a given year. Expected dividend yield is the ratio of cash dividends and the fiscal year-end stock price. For the risk-free rate, we use the treasury bond yield corresponding to the option's expected time to maturity.

<sup>7</sup>The sample firms are distributed across a large number of two-digit SIC industries. The four industries with the highest representation are Communications (14%), Business Services (5%), Primary Metals (5%), and Health Services (5%).

## 2.2 CEO turnover statistics

Our 322 sample firms have a total of 642 CEOs. Of these, 190 are retained as CEOs by the restructured firm one year after emergence. Moreover, 447 CEOs depart our sample firms (we are unable to verify whether five CEOs of firms acquired in bankruptcy also left). Table 2 reports annual departure and entry frequencies. Consistent with earlier studies of Chapter 11 bankruptcy (Gilson, 1989; Hotchkiss, 1995), we label a CEO an incumbent if he is CEO of the filing firm at the end of year -3. Since incumbent CEOs are more likely to be held responsible for the firm's bankruptcy filing, we separate incumbents from replacement CEOs in much of the analysis to follow. There are a total of 322 incumbents and 320 replacement CEOs in the sample. As shown in the last row of column (7) in Table 2, by the end of year Emergence+1, 277 or 86% of the incumbent CEOs have been replaced during the event window. That is, 14% of the incumbent CEOs remain as CEO of the restructured firm one year after emergence (column (2)).<sup>8</sup> The average departing CEO is 55 years old and has served as CEO for six years.

Turning to the 320 replacement CEOs, Table 2 column (4) shows that 126 or 40% were internal promotions. We distinguish these internal replacement CEOs from the 194 that were hired from outside the company (column (5)), here labeled external replacements. As indicated in footnote *a* of the table, news articles describe on-third of the external replacement CEOs as restructuring specialists, while two-thirds have prior CEO experience. The average age is similar across incumbent and replacement CEOs (56 and 54 years, respectively), while the average tenure at the time of departure is substantially longer for incumbent CEOs (8 years versus 3 years for replacements). There is no discernible difference in the average age and tenure between internal and external replacement CEOs.

The turnover rate for replacement CEOs in Table 2 is lower than for incumbent CEOs: a total of 170 (53%) replacement CEOs have left by year-end Emergence+1. As shown in columns (8) and (9), 74 (60%) of the internal replacement CEOs and 96 (50%) of the external replacement CEOs leave the firm during the sample period. The turnover rate is highest during Chapter 11 proceedings. As shown in column (6) of Table 2, 143 (one-third) of the 447 departing CEOs leave during the two fiscal years prior to the filing year. Another 259 (58%) of the CEOs leave during Chapter 11 proceedings, while the remaining 45 (10%) depart in the year after emergence from Chapter 11.

Looking across the event window from year -3 through Emergence+1, the average annual rate of CEO

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<sup>8</sup>In comparison, Gilson (1989) reports a 29% CEO retention rate through bankruptcy, Hotchkiss (1995) a rate of 30%, and Betker (1995) a rate of 9%.



turnover in Table 2 is 30%. This rate is comparable to turnover rates reported elsewhere for firms in financial distress (Ayotte and Morrison, 2009; Jiang, Li, and Wang, 2012), and it is substantially higher than for solvent firms (Huson, Malatesta, and Parrino, 2004; Jenter and Kanaan, 2010). Inside Chapter 11, 39% of the CEOs are replaced in an average year. Outside of Chapter 11, in the years prior to filing and after emergence, the average annual turnover rate is 22% (for both event periods) which is only slightly higher than what has been reported elsewhere for solvent firms.

### 2.3 Forced versus voluntary departure

Our data sources identify the reason for departure for 91% of the 447 CEOs who depart over the sample period. Table 3 lists the frequency distribution of the stated reasons for CEO turnover, split by incumbent and replacement CEOs. The classifications are similar to those found in the literature (Gilson, 1989; Denis and Denis, 1995). As shown in the first two columns, 21% (the largest group) leave for personal reasons. Another 19% lose their job because the firm is liquidated or acquired in bankruptcy. Other reasons for departure involve retirement or normal succession (15% in total), pressure from the board, shareholders or creditors (14%), pursuing other interests (11%), and poor performance (3%). Six percent leave for a variety of other reasons, including end a transition period, finish restructuring the company, return to own company, and investigation or inquiry by a special committee. Two CEOs leave their positions due to illness or death.

In Table 3, we classify the CEO departures as forced or voluntary, based on the reasons for departure. In our definition, a departure is forced if it follows pressure by the board, shareholders or creditors, or if it is performance related. All other departures are classified as voluntary. This definition is somewhat conservative since press releases may not always identify a truly forced turnover as forced. On the other hand, it seems reasonable that if a press report does indicate that a management change is forced or that it is due to poor performance, we can be confident that the change is indeed forced (Denis and Denis, 1995).

As shown in the second column of Table 3, 18% of all CEO departures are forced: 21% for incumbent CEOs (column (4)), 16% for internal replacement CEOs (column (8)), and only 9% for external replacement CEOs (column (10)). The 21% rate for incumbents is within the range of forced CEO departures reported in the extant literature for firms *outside* of bankruptcy—ranging from about 13% (Denis and Denis, 1995; Parrino, 1997; Huson, Parrino, and Starks, 2001) to about 25% (Yermack, 2006; Jenter and

Kanaan, 2010; Goldman and Huang, 2011). These extant studies classify all CEO departures as forced when the CEO is less than 60 years old. We do not use this criterion as it would mean, for example, that most of the CEO departures following liquidation in bankruptcy would be classified as forced, even if the CEO was hired to help liquidate the firm. We take this more conservative route because there may be many reasons for a relatively young CEO to leave a severely distressed company voluntarily. The main empirical conclusions below do not change materially if we use a broader definition of forced departure that accounts for CEO age.

## 2.4 CEO compensation at the distressed firms

Figure 1 plots the median total CEO compensation at the distressed companies from year -3 through year Emergence+3, excluding the period in bankruptcy (because it varies in length across filing firms). Until the year of filing, the sample size is 322 firms. Of these, 84 firms (69 prepacks and 15 non-prepacks) file and emerge from bankruptcy in the same fiscal year. To avoid double-counting, the graph includes these firms in the year of emergence only.<sup>9</sup> After emergence, the sample is restricted by the availability of compensation data for the surviving companies. Of the 322 filing firms, 205 emerges as going concerns (Table 2) and, of these, 125 file a 10-K in the year of emergence. Figure 1 plots the median CEO compensation for these 125 firms starting with event year Emergence. Panel A plots total compensation in \$ thousand, while Panel B plots a compensation index which is normalized to one in event year -3. The figure shows the compensation for our sample CEOs as well as for a comparison sample of CEOs of firms in ExecuComp, matched on the bankrupt firm's two-digit SIC industry and total sales.<sup>10</sup>

As shown in Panel A of Figure 1, CEOs of distressed firms have a somewhat lower median compensation than CEOs of matched firms three years prior to bankruptcy filing (\$1.4 million vs. \$1.8 million). Beginning in year -2, the CEOs of the filing firms start to experience a compensation decline and a widening compensation gap to the median matching firm CEO, probably reflecting the poor performance of the sample firms.<sup>11</sup> In the year of filing, the median CEO compensation at the bankrupt firm is down

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<sup>9</sup>This is a matter of convenience as our inferences are the same if we instead were to include these in the filing year and not in the year of emergence.

<sup>10</sup>We perform the match at the beginning of each event year. For 20% of the CEOs, the sales of the matched firm in the two-digit industry is at least 30% greater or smaller than the sales of the bankrupt firm. We then select a matching firm at the one-digit industry level and closest in sales.

<sup>11</sup>There appears to be a slight decline in the median CEO total compensation in years -1 and 0 also for the matched firms. This is consistent with the existence of an industry-wide performance decline around bankruptcy events (Lang and Stulz, 1992).

to \$1.0 million, less than half of the median matched firm CEO compensation of \$2.4 million. For the sample firms that successfully emerge from bankruptcy, the median compensation is \$1.7 million in the year of emergence, which is almost identical to the median CEO compensation of the matching firms. Thus, the restructured firms appear to resume paying a competitive compensation after emergence from bankruptcy to attract and retain high-quality executives. This compensation pattern is confirmed in Panel B, where the income in year -3 is normalized to 1.0 for both sample CEOs and their matches.

Figure 2 plots the median proportion of total compensation paid in cash (as opposed to stocks and options) around bankruptcy filing. At the beginning of the event window, three years prior to filing, the sample firm CEOs receive a higher proportion of their pay in cash than their matched firm peers (79% vs. 61%). Recall that the sample firms perform relatively poorly already at the outset of the sample period, with a median ROA that is 3.5% below the industry median in year -2. The relatively poor firm performance tends to result in smaller equity awards and a lower total compensation (shown in Figure 1 above). These smaller equity awards result in a higher fraction of cash pay relative to that of the industry peers of our sample CEOs, as shown in Figure 2. Moreover, when the firm files for bankruptcy, the figure shows that the median CEO is paid in cash only. This change in part reflects the poor stock liquidity and delisting typically associated with bankruptcy filings, and which tend to lower the attraction of equity-based compensation. However, once firms have emerged from bankruptcy, Figure 2 shows that a substantial fraction of the median CEO compensation is again paid in stock and options (converging at about 20% in year Emergence+2).

## 2.5 Severance payments

CEO employment contracts often specify a minimum separation pay if the CEO is dismissed due to poor performance, for reasons other than willful misconduct or breach of fiduciary duties (Schwab and Thomas, 2004). Contractual severance pay is, however, typically not paid if the CEO leaves voluntarily before contract expiration. Moreover, boards frequently award discretionary (non-contracted) severance pay or “golden handshakes” in order to facilitate a smooth transition to the new CEO, and some former CEOs are given status as Honorary Chairman (which may also be interpreted as a form of severance). Separation agreements, which are negotiated and signed right before the CEO leaves the company, also

often include non-compete and non-solicitation provisions for a period of one to two years.<sup>12</sup>

We include severance pay as part of the departing CEO's compensation. We obtain this information from 10-Ks, proxy statements, and Factiva news searches. Details on the severance awards made to departing CEOs are reported in Table 4. We identify whether the separation pay is based on an explicit employment contract or if it is discretionary.<sup>13</sup> 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.<sup>14</sup>

As reported in Table 4, severance is paid to 28% of the CEOs that leave in the event period around bankruptcy filing. The median amount paid is \$1.6 million or three times the departed CEO's total annual compensation. CEOs that find new full-time executive employment are more likely to receive severance than CEOs with no new employment (39% versus 24%). Moreover, CEOs of bankrupt firms that are *forced* to leave receive severance more often than CEOs leaving voluntarily (43% vs. 24%), in greater average amount (median \$2.9 million vs. \$1.3 million), and more often in the form of discretionary severance.

While, to our knowledge, our study is the first to systematically document severance payments around Chapter 11 filings, several studies report severance pay statistics outside of financial distress (Almazan and Suarez, 2003; Fee and Hadlock, 2004; Yermack, 2006; Goldman and Huang, 2011). These studies also show that dismissed CEOs are much more likely to receive severance payments than CEOs who resign voluntarily. However, while 28% of the departed CEOs in our sample receive severance payment, the percentage is generally higher outside of bankruptcy (between 40% and 50%). The relatively low frequency of severance payment documented here likely reflects the poor firm performance of our sample firms.

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<sup>12</sup>Recall that we are searching forward up to three years in order to establish a departed CEO's new position. This three-year search is in part motivated by the need to overcome a two-year absence from the labor market triggered by a non-compete clause.

<sup>13</sup>In a few cases, Factiva specifies the total severance only. We then record the entire severance amount as contract based.

<sup>14</sup>We do not have data on CEO pensions. Pension liabilities represent general unsecured claims, prompting some firms to arrange trust funds or insurances to protect the CEO from pension losses in the case of bankruptcy. Sundaram and Yermack (2007) report that, outside of bankruptcy, the median pension value for CEOs of S&P500 index firms is 7% of the value of the CEO's equity holdings. See also Bebchuk and Jackson (2005).

### 3 CEO employment and human capital changes around bankruptcy

In this section, we identify CEO post-turnover careers and estimate subsequent employment income. As explained below, our measure of the bankruptcy-induced change in CEO human capital is the present value of the difference between the CEO's old and new income until retirement age, while accounting for severance pay. The loss of CEO personal equity investments in the bankrupt firm, which comes in addition to any loss of human capital, is documented separately in Section 6.

#### 3.1 Identifying CEO career and employment changes

Recall from Table 3 that our sample includes 447 CEO departures over the sample period. For these departed CEOs, we first determine whether the former executive stays on as a director of the board of the sample firm using information (proxy statements and 10-Ks) for the fiscal year after turnover. Next, we search for subsequent employment information using corporate registries, news and press releases through Factiva, LinkedIn and Wikipedia, and Google searches.<sup>15</sup> As it turns out, a majority of our post-turnover employment information is obtained through searches of social media and the internet. If the CEO fails to take new employment within three years of departure, we record this as having no new position (discussed further below). Conditional on finding new employment, it takes on average one year before a departed CEO joins a new firm.

Table 5 summarizes the frequency distribution across different categories of subsequent CEO employment. Of the total sample of 607 CEOs in Panel A, 45% maintain full-time executive employment.<sup>16</sup> These include 160 CEOs (26% of total sample) that retain their position with the restructured firm at least through the end of year Emergence+1. The retention rate is significantly lower for incumbent CEOs than for replacement CEOs: 14% of the 322 incumbents retain their CEO position in the distressed firm (column (4)) while 41% of the 285 replacement CEOs do so (column (6)).

Panel B of Table 5 restricts the sample to the 447 CEOs who depart the distressed firm during the event period. As shown in column (1), 111 or 25% of the departed CEOs succeed in finding new full-time

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<sup>15</sup>Corporate registries include Standard and Poor's (S&P) Register of Corporations, Directors, and Executives, and Who's Who in Finance and Business. For example, 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.

<sup>16</sup>The total sample is 607, down from 642 in Table 2, because we exclude 30 replacement CEOs hired in event year Emergence+1 and are unable to follow five CEOs of firms acquired in bankruptcy.

executive position. Again, this success rate is lower for incumbents than for replacement CEOs: 21% (column (4)) versus 32% (column (6)). Of the 111 CEOs, 5% become CEOs at other public firms, 9% become CEOs at private firms, 3% become non-CEO executives at public firms, and 7% become non-CEO executives at private firms. Overall, these findings suggest that the labor market tends to hold incumbent CEOs more often responsible for the firm's financial difficulties than replacement CEOs.<sup>17</sup>

Panel B of Table 5 further shows that of the 336 departed CEOs who find no new full-time executive employment, 18% become non-executive directors, and another 16% become consultants, politicians or self-employed. The remaining departing CEOs are classified as finding no new employment within three years of leaving the distressed firm. As indicated in the footnote to the table, even within this subgroup of departing CEOs, our data sources positively identify post-departure information for 42%: 28 became Honorary Chairman of the sample firm's board, 36 retired or died, 11 went to prison or were under investigation, and one went into academia.

In sum, our search procedure positively identifies career-related information for as much as 83% of the total sample of CEOs. Moreover, we are quite confident that also the remaining 17% (106) departing CEOs are correctly classified as finding no new executive employment. Significant executive employment information would likely have appeared somewhere in the company reports, industry manuals, press reports, and internet/social media that we rely upon. We also find that a greater fraction of the 106 departed CEOs without new employment information were *forced* to leave (relative to the fraction in the remaining sample). This helps explain why they may have found it particularly difficult to return to new executive employment.

The CEO employment evidence in Table 5 extends the evidence on CEO turnover in Table 2 by also accounting for the departing CEO being able to maintain a full-time executive position after departure. From the perspective of the CEO, what matters is not only the retention probability but also the (conditional) probability of being able to move to a full-time executive position at another firm. As shown in the last row of panel A of Table 5, as much as 32% of the incumbent CEOs are either retained after emerging from bankruptcy or move to a new full-time executive position. When we also include the post-departure employment of 60% for the replacement CEOs, the overall percentage increases to 45%.

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<sup>17</sup>Public firms hiring departed CEOs tend to be of a similar asset size as the departed CEO's previous employer. Private firms hiring departed CEOs as non-CEO executives tend to be substantially smaller in terms of sales (\$65 million vs. \$ 858 million). Only one-third of the departed CEOs with new full-time executive employment join a firm in the same two-digit SIC industry, suggesting that a substantial number of the departed managers have managerial skills of value also for companies in largely unrelated industries (Murphy and Zabojsnik, 2007).

In sum, close to half of the sample CEOs succeed in either remaining CEO of the restructured firm or departing to a full-time executive position at another public or private firm.<sup>18</sup>

### 3.2 Estimating changes in CEO human capital

We calculate the CEO income change as the difference between the “old” (observed) income at the distressed firm and the “new” (observed or estimated) employment income. For incumbent CEOs, the old income is the compensation in event year -3 or, if missing, in year -2. For replacement CEOs, the old income is the average income in the year of hiring and the first full year of employment (or, if the latter is missing, in the year of joining the sample firm). Missing or zero initial income data for 63 CEOs reduces the sample from 607 cases in Table 5 to 544 cases used in our CEO income change analysis below.<sup>19</sup>

The new employment income is at the restructured firm emerging from bankruptcy if the CEO is retained, at another public or private firm if the CEO departs to an executive position, or in some form of non-executive employment such as a directorship or consultancy. The new income is zero if employment is discontinued. Below, we first describe how the new income level is identified. We then report the present value of the CEO’s annual total income change until a fixed retirement age of 65 years (“PV income change”), which is our measure of the change in CEO human capital.

#### 3.2.1 Identifying the CEO’s new employment income

As indicated above, bankruptcy may result in the firm emerging as a public or a private firm, or be acquired or liquidated. Moreover, the old CEO may retain the CEO position, or he may assume a full-time executive position at another public or private company—or find no new executive position. Table 6 shows the mapping of this diverse set of outcomes and our methodology for identifying and estimating the CEO’s new employment income.

First, if the company emerges from bankruptcy as a *public* company and retains the CEO, or if the sample CEO leaves to become CEO at another public firm, we identify the actual compensation using information in ExecuComp or proxy statements and 10-Ks. As shown in Table 6, the sample contains

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<sup>18</sup>Table 5 also shows that it matters little for the rates of subsequent employment of replacement CEOs whether the replacement is external or internal. In most of the analysis to follow, we group these two categories into one.

<sup>19</sup>Of the 63 CEOs eliminated from the income analysis, 10 show an old income of zero while 53 have missing old income. Of the 53, 44 are replacement CEOs hired after bankruptcy filing and there is no 10-K or proxy is available or they do not stay for a full year. The remaining 9 CEOs (six of which depart before year -1) are incumbents without pay information available in years -3 or -2.

78 *CEOs who are retained* by firms emerging as public companies in year Emergence+1. For these CEOs we use the average actual pay in event years Emergence+1 and Emergence+2 as the CEO's new income. This averaging helps smooth effects of potential restructuring bonuses (for 37 cases, the income in Emergence+2 is missing and we use the Emergence+1 income only).

Similarly, for the  $20+12=32$  CEOs in Table 6 who depart to become *CEOs* or *non-CEO executives* at other public firms, we use the average pay in the year of hiring and the first full year at the new firm as the CEO's new income. Again, this helps smooth short-term effects of potential signing bonuses and partial-year pay in the first year at the new firm. In total, we are able to use the *actual* (not estimated) new income for  $78+32=110$  CEOs who continue as executives at public firms. This subsample with actual new income observations constitutes almost half of the total sample of 233 CEOs in Table 6 that retain full-time executive employment in public or private companies.

As a check on how the matching firm estimation procedure compares with the actual CEO income levels identified using the above procedure, we also collect the income for CEOs of ExecuComp firms matched on two-digit SIC industry code, sales and year. This matching procedure appears to work well. Consistent with the sample-wide results in Figure 1, the median CEO income of matched firms is statistically indistinguishable from the median actual CEO compensation following bankruptcy. This finding is reassuring as we use the matching technique to estimate the income of CEOs who depart to private companies. Importantly, this finding also indicates that, conditional on receiving new full-time executive employment, the labor market does not appear to punish CEOs leaving failing firms by lowering their income (we elaborate further on this key finding below).

For CEOs that remain or depart to become executives at *private* firms, we use the pay at a matching public firm in ExecuComp, adjusted by a 20% private-firm discount as estimated by Gao, Lemmon, and Li (2011). Using this discount is supported by the fact that the median sales of the private firms in our sample is close to that of the private firms in Gao, Lemmon, and Li (2011). The matching firm is in the same two-digit SIC industry and year as the private firm, and the closest in sales, assets, or number of employees (in the mentioned order of data availability).

To estimate the new pay of the 75 departed CEOs who become *non-executive directors*, we use director compensation data for all ExecuComp firms in the 2005 to 2012 period (ExecuComp began reporting director compensation in 2005). Specifically, as summarized in Appendix Table 2, using a sample of 12,740 firm-years, we regress firm average director compensation on sales, total assets, and employees,



respectively, and control for industry at the two-digit SIC code level (director compensation and all size measures are in logs). We then apply the coefficient estimates to predict the non-executive director pay at the firm where the departed CEO becomes a director.

For the 66 executives that become *consultants, politicians, or self-employed*, we assume an average income of \$500 thousand (in 2009 dollars). This is the typical consulting contract offered to departed CEOs in our sample and the average compensation paid to principals of large consulting companies over the sample period.<sup>20</sup>

Finally, the 170 departed CEOs classified as receiving no new employment are assigned a new-employment income of zero. Provided that the no-new-employment classification is correct, there is little or no estimation error associated with this zero value. Thus, when combining no-new-employment observations with the 110 CEOs who continue as executives at public firms and for whom we directly observe new employment income, there is negligible new-income estimation error associated with half of all CEOs in Table 6. For the other half, where the CEOs continue as full-time executives at private companies, the new-income estimation error depends on the validity (on average) of the 20% public-to-private employment discount from Gao, Lemmon, and Li (2011). Moreover, as elsewhere in the compensation literature, the estimation error depends on how well compensation in public firms matched on size and industry mimics private company pay.

### 3.2.2 Changes in CEO human capital

CEO changes in human capital are calculated as the present value (PV) of CEO income change assuming that the new employment income is maintained until age 65 (zero thereafter). The PV calculation uses a 10% discount rate for all CEOs and all years (our conclusions are qualitatively the same with a 5% discount rate), it adds severance pay when present, and it adjusts for any time delay before starting the new employment.

Table 7 reports mean and median values of the CEO income change in columns (2) to (5), and of the PV income change in columns (6) to (9). The table lists results for the total sample of CEOs as well as separately for departed CEOs and for CEOs who remain with the restructured firm after bankruptcy.

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<sup>20</sup>For example, Donald Amaral of Coram Healthcare was paid \$200,000 per year 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 a consultant. In some cases, 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 income change measures are reported three ways: in dollar thousands, in percent and as a multiple of the CEO's old pay. The total number of income-change observations for each subsample is shown in the first column. The empirical income-change distribution is skewed to the left and contains outliers. To minimize the influence of outliers on our main inferences, we follow much of the extant compensation literature and focus on median values, here shown in columns (4), (5), (8) and (9).

As shown in Panel A of Table 7, the median CEO experiences a compensation drop of 88% (column (5)) and a PV income change of -\$3.2 million (column (8)), which equals 3.1 times old pay (column (9)). In comparison, without accounting for new employment income, Gilson (1989) estimates a median present value income loss for 73 managers who depart from financially distressed firms of close to six times the CEO's pre-turnover income. Panel A of Table 7 also shows that the managerial labor market penalizes incumbent CEOs significantly more than their replacements. The median income change is -94% for incumbents compared to -54% for replacement CEOs. The associated PV income change is -\$4.8 million (3.8x old pay) for incumbents and only -\$2.2 million (2.2x old pay) for replacement CEOs.

The results in Panel A of Table 7 pool CEOs who maintain full-time executive employment after resolution of bankruptcy with CEOs who don't. Naturally, CEOs who fail to find new employment are going to suffer a significant employment-income decrease. Thus, the more interesting issue is the magnitude of the income change of CEOs who maintain various forms of full-time employment. The remaining panels in Table 7 therefore separate out the various new-employment categories from the no-new-executive-employment sample.

First, Panel B shows that the median income change is small and positive for the total group of 233 CEOs that continue in full-time executive positions—either at the restructured sample firm or another firm. The median percentage income change is 16% and the PV income change is \$210,000. The income change for the subgroup of incumbent CEOs is also small and slightly lower than for replacement CEOs. As shown in the last row of the panel, the difference in income change between these two groups is significant at the 5% level, while the difference in PV income change is statistically insignificant with a p-value of 0.11.

Second, Panels C and D separate the 135 CEOs who are retained at the sample firm from the 98 CEOs who depart to a new full-time executive position. Interestingly, in Panel C, the median CEO retained by the firm emerging from bankruptcy experiences a substantial pay increase of 24% and a PV income change of \$652,000—equal to 0.8 times one full year of old pay. For the 44 incumbents, the ratio is 1.1

while it is 0.8 for the 91 replacement CEOs (hired before the year-end of emergence and retained by the firm one year after emerging from bankruptcy). The difference between the two ratios for incumbent and replacement CEOs is not statistically significant (p-value of 0.69).

Panel D reports the income change for the 98 CEOs that depart the distressed firm and receive new full-time executive employment. Here, incumbents experience an income drop while replacement CEOs do not (with the difference in the dollar-value loss being significant at the 5% level). Incumbent CEOs with new executive positions have a median income change of -22% and a PV income loss of \$1.1 million (1.5x old pay). In contrast, replacement CEOs finding new executive positions receive a median income increase of 38% and a PV income gain of \$1.0 million (2.1x old pay). This difference, which is significant at the 5% level, most likely reflects two factors: first, by virtue of their longer tenure with the bankrupt firm than the replacement CEOs, the incumbents are to a greater extent blamed for failing to keep the firm from filing for bankruptcy. Second, both incumbents and replacement CEOs gain valuable managerial experience by going through bankruptcy. The net effect of these two factors is more positive for replacement CEOs than for incumbents.

Finally, Panel E shows results for the sample of 311 CEOs who depart with no new full-time executive position. For these, the median pay change is -100% and a PV income change of -\$6.5 million (4.8x old pay), which is significantly lower than for CEOs maintaining executive employment. Conditional on receiving no new executive position, both incumbent and replacement CEOs seem to incur income losses of a similar magnitude (the difference in PV income change multiple is not statistically significant, with a p-value of 0.17).

Overall, our results suggest that changes in CEO labor market rents vary considerably across incumbents and replacement CEOs and with the CEOs' subsequent employment opportunities. CEOs that leave and fail to find continued executive employment experience particularly large costs, while managers that remain at the helm of the restructured firm experience a slight income gain. Incumbent CEOs experience greater income losses than their replacements for two reasons. First, and most important, as shown in Table 5 above, they are less likely to continue running the restructured firm or find new executive employment. Second, conditional on receiving full-time executive positions at other firms, their new equilibrium pay is slightly lower compared to that of replacement CEOs. This is consistent with incumbent CEOs bearing substantial labor market costs after their firms fail.

### 3.3 CEO compensation: internal v. external replacements

While the previous section present a longitudinal analysis of CEO compensation at the old and new firm, we now turn to a comparison of the compensation packages of departing and incoming CEOs within bankrupt firms. The latter is also interesting as it provides evidence on a different set of labor market prices (compensation of outgoing versus incoming executives) spurred by bankruptcy.

Table 8 presents univariate comparisons of the total compensation and the fraction of the total compensation paid in cash. Columns (1) to (3) show the compensation of the departing CEOs in the fiscal year prior to leaving, while columns (4) to (6) list the compensation in the year of hiring for the CEOs that replace them.<sup>21</sup> In columns (7) and (8), we report the p-values from tests of the difference in mean and median, respectively. All panels report separately the compensation of internal and external replacement CEOs, and the departing CEOs that they replace. As in the previous section, because the distribution of total pay is skewed, we focus on medians (columns (3) and (6)).

The first row of Panel A shows that the median internally promoted CEO is compensated at a 25% discount relative to his predecessor: \$0.9 million (column (6)) versus \$1.2 million (column (3)), respectively. In contrast, the second row shows that there is no significant pay difference between the median external replacement CEO and the departing CEO he replaces: \$1.3 vs. \$1.5 million (a p-value of 0.49 for the difference). The proportion of the total compensation that is paid in cash is similar for the departing CEO and the internally promoted replacement (medians 0.97% and 0.94%), while it is significantly lower for external hires (median 69%).

Panels B and C of Table 8 separate non-prepackaged filings (Panel B) from prepackaged filings (Panel C). The conclusions based on Panel A do not change with one notable exception: in the sample of prepacks, when the replacement CEO is an external hire, the median compensation of the replacement CEO is 66% higher than the compensation of the CEO being replaced: \$1.4 million versus \$0.8 million, respectively. This pay premium also comes with the lowest proportion cash pay reported in Table 8: median 53%.

Gilson and Vetsuypens (1994) study 77 U.S. firms that privately restructure their debt or file for Chapter 11 bankruptcy in the 1980s and find also that internally promoted CEOs are paid significantly less than the CEOs that they replace. Moreover, in their sample, externally hired CEOs are paid significantly

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<sup>21</sup>We use the year before departing to avoid any confounding effect of partial-year compensation data when the CEO leaves before year-end.

more than the departing CEOs. As shown above, this pay difference exists only in our subsample of firms that make prepackaged bankruptcy filings.<sup>22</sup>

The analysis so far suggests that the loss of CEO human capital around corporate bankruptcy reflects a number of characteristics related to CEO quality, the state of the bankrupt firm, and specifics of the bankruptcy filing itself. We now turn to a full regression analysis of these characteristics.

## 4 Determinants of CEO turnover and career change

In this section we provide a cross-sectional analysis of the determinants of (i) forced and voluntary turnover, (ii) CEO career changes around bankruptcy filings, and (iii) the income change of departed CEOs. These three outcomes jointly determine the CEO human capital change around bankruptcy, and the regression results help identify major drivers of this change.

### 4.1 CEO, firm, and bankruptcy characteristics

The regressions below use a common set of explanatory variables for all of the choices and outcomes. As before, all variables are defined in Appendix Table 1, and all variables are lagged by one year. Variables designed to control for CEO power and entrenchment include CEO age (*Age*), tenure (*Tenure*), a dummy variable indicating that the CEO is Chairman of the board (*Chairman*), and the percent of the firm's shares owned by the CEO at the end of the previous year (*Ownpct*). Again, we are particularly interested in the labor market reaction to incumbent CEOs, represented by the dummy variable *Incumbent*.

The second set of variables captures effects of firm and industry performance in the previous year. These include *Size* (log of total sales), *Cash* (cash and short-term investments) and *Tangibility* (net property, plant and equipment), the latter two normalized by total assets. The variables *Industry adjusted ROA* and *Industry adjusted leverage* compare the sample firm's ROA and leverage, respectively, with the respective ratio of the median firm in its two-digit SIC code industry. The regressions further control for industry distress by including a dummy variable (*IndDistress*) that takes the value of one if the median stock return of the firm's two-digit SIC industry code is below -30% (Acharya, Bharath, and Srinivasan, 2007).

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<sup>22</sup>Outside of financial distress, Custodio, Ferreira, and Matos (2013) who study CEO characteristics in S&P1,500 companies during the period 1993 to 2007 also find that external hires are paid more than the outgoing CEOs.

In choice models where the firm’s claimholders potentially influence the CEO hiring/firing decision, we include three variables that describe the firm’s capital structure. *Institution  $\geq 25\%$*  is a dummy variable which is equal to one if institutional investors own more than 25% of the firm’s equity in the previous year. Ownership data is obtained from 13-F filings with the SEC, and the 25% threshold is the sample average institutional ownership in our sample firms in the fiscal year prior to bankruptcy filing. For years in bankruptcy when there is no 13F data (due to delisting of the firms’ stock following bankruptcy filings), we set *Institution  $\geq 25\%$*  to zero. 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 the total liabilities of the bankrupt firm.

The last set of explanatory variables captures characteristics of the bankruptcy filing itself. *During bankruptcy* is a dummy variable indicating firm-years from filing through emergence. *Prepack* takes the value of one for firms filing prepacks. *Fraud* is a dummy variable indicating that there are security fraud claims against the company (obtained from the LoPucki database). Apparently, some of these firms conceal their financial difficulties until they are severe enough to cause bankruptcy. Finally, *DIP Financing* is a dummy variable indicating that the firm receives debtor-in-possession financing in bankruptcy. DIP lenders have substantial influence over the bankrupt firm’s day-to-day decisions through tight covenants (Dahiya, John, Puri, and Ramirez, 2003; Skeel, 2003; Li and Srinivasan, 2011).

## 4.2 The probability of forced and voluntary turnover

Table 9 presents coefficient estimates from multinomial logit regressions for the probability of CEO turnover. The dependent variable has three outcomes: voluntary turnover, forced turnover, and no turnover (the reference outcome). The sample comprises 1,184 firm-years from year -2 through Emergence+1 (or the year of acquisition or liquidation in bankruptcy), of which 237 firm-years have voluntary CEO turnover and 66 have forced CEO turnover. Model (1) includes the CEO, firm and bankruptcy characteristics discussed above, while models (2) and (3) add the capital structure characteristics. Included in the regressions, but not reported, are indicators for the sample firms’ Fama-French 12 (FF12) industry.

Starting with the decision to leave the firm voluntarily (the first column of each of the three models), the probability of voluntary departure increases with *Age* and decreases with *Chairman* and *Ownpct*. The positive impact of CEO age suggests that older executives have a greater incentive to leave the

distressed company rather than partaking in the restructuring. On the other hand, this incentive may be attenuated for CEOs with larger equity ownership and greater influence over the board (as chairman).<sup>23</sup>

CEOs of firms with relatively poor operating performance (*Industry adjusted ROA*) are also more likely to leave voluntarily. This finding is consistent with the extant turnover literature for non-bankrupt firms, such as Huson, Parrino, and Starks (2001). After controlling for CEO characteristics, such as tenure and firm performance, Table 9 also indicates that the likelihood of voluntary turnover is higher for incumbent CEOs than for replacement CEOs (albeit at a 5% significance level only).

Turning to determinants of forced CEO turnover—the second column of each of the three models in Table 9—incumbent CEOs are more likely to be forced out also in a multivariate setting.<sup>24</sup> Moreover, poor operating performance, which increases voluntary CEO turnover, is associated with greater forced turnover as well. There is also some evidence of higher forced turnover at relatively large firms and firms with high leverage, as well as in firms with allegations of accounting fraud.

Moreover, with a strongly significant coefficient on *During bankruptcy*, the regressions indicate greater forced turnover during Chapter 11 reorganization. This shows that the greater percentage turnover inside bankruptcy shown earlier in Table 2 holds in a multivariate setting. Moreover, it raises an interesting question: if the CEO is going to be forced out, why wait until after Chapter 11 filing? While the answer is likely to be complex, it may reflect the change in control rights from shareholders to creditors in bankruptcy. While a shareholder-driven board of directors may have a favorable view of the CEO, creditors may have a different view and use their enhanced control rights to force out the CEO during bankruptcy proceedings.

For example, using the vernacular of Jensen and Meckling (1976), suppose that the CEO implements shareholder-friendly risk-shifting strategies in an attempt to avoid bankruptcy. When the strategy fails, creditors bear the brunt of the costs and may hold the CEO personally responsible after bankruptcy filing. Creditors may enforce their negative view of the CEO during the debt restructuring process, as well as formally through contractual provisions when providing DIP financing. For example, in one of our sample filings (Recotron in 2003), senior creditors demanded replacement of the incumbent CEO with Jerry Kalov (from the outside), and wrote a DIP financing covenant stating that removal of Kalov would be considered a default event on the DIP facility. The positive coefficient for *DIP financing* in Table 3 is

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<sup>23</sup>Outside of bankruptcy, Hazarika, Karpoff, and Nahata (2012) find that managerial turnover following earnings management and restatements are negatively correlated with CEO chairmanship and equity ownership.

<sup>24</sup>Recall the greater univariate rate of forced turnover of incumbent CEOs documented earlier in Table 3.

consistent with creditors exercising the right to fire the CEO (significant at the 5% level).

Note also that different creditor classes may have different views of the value of keeping versus firing the CEO. In Table 9, the coefficient estimate for *Trade debt  $\geq$  70% of liabilities* is negative and significant, indicating that the existence of large trade credit financing reduces the likelihood of forced CEO departure. Input suppliers attempting to secure continued business with the restructured firm after it emerges from bankruptcy may well decide that retaining the incumbent CEO is the most effective way to achieve this goal. A case in point is the 2007 filing by Hancock Fabric: Hancock’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.<sup>25</sup>

Finally, the variable *Prepack* receives a positive and weakly significant coefficient in the regression for voluntary CEO turnover and a small and insignificant coefficient in the regressions of forced departure. However, since the decision to file a prepackaged bankruptcy petition is under the CEO’s control, it may be correlated with some of the other firm characteristics in these turnover regressions. We therefore also report separate regressions in Table 9 excluding the 358 firm-year observations in our sample for firms filing prepacks. As shown in the last two columns of the table (model (3)), all the above inferences continue to hold for the subsample of non-prepack bankruptcy filings as well.

In sum, accounting for CEO, firm and bankruptcy characteristics, CEO turnover increases as the distressed firm restructures in bankruptcy. Moreover, CEO turnover is higher for incumbent executives than for replacement CEOs, consistent with incumbents being the primary executive held responsible for the firm’s failure to deal with financial distress. Relatively powerful CEOs, with large equity stakes and holding the Chairman position, are less likely to leave voluntarily, while older CEOs are more inclined to step down. Forced turnover increases during bankruptcy reorganization, possibly because of the shift in control rights from equity to creditors after bankruptcy filing.

### 4.3 The probability of departing without new full-time executive employment

Table 10 reports the coefficient estimates from multinomial logit regressions for the probability of CEO departure followed by no new executive employment. The dependent variable has three outcomes: depar-

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<sup>25</sup> Hertznel, Li, Officer, and Rodgers (2008) and Kolay and Lemmon (2012) also present evidence relevant for understanding the incentives of input suppliers in bankruptcy. The former study show that bankruptcy filings tend to have a large negative valuation impact on suppliers, while the latter find that suppliers continue to support their distressed customers by extending short-term credit.



ture with new full-time executive position (with associated coefficient estimates in the first column of the model), departure with no new full-time executive position (with associated coefficient estimates in the second column), and no departure (the reference outcome). The explanatory variables are the same as in Table 9. Models (1) and (2) use the full sample of 1,184 firm-years, while model (3) eliminates 358 cases where the sample firms file prepackaged bankruptcies. All regressions include FF12 industry dummies.

As shown in Table 10, the probability of leaving without finding new full-time executive employment increases with CEO age. This is hardly surprising as older CEOs are more likely to retire. Interestingly, the probability of leaving without finding new full-time executive employment decreases (weakly) in *Ownpct* and *Chairman*. Recall from Table 9 that these more powerful CEOs are less likely to leave voluntarily. In other words, when combining the findings of the two tables, the evidence suggests that more powerful CEOs are both more likely to stay with the distressed firm and less likely to leave and end up without a new full-time position. While we do not observe our sample CEOs' outside opportunity set, this combined finding suggests that more powerful CEOs use their power to avoid turnover when their outside opportunities are relatively limited.

Another interesting result in Table 10 is that the probability of leaving the firm with no new full-time executive employment is significantly higher for incumbent CEOs than for replacement CEOs: the coefficient on *Incumbent* is positive and highly significant when estimating this probability. Moreover, this probability decreases with the firm's *industry-adjusted ROA*. This supports the notion that both *incumbent* and *Industry adjusted ROA* are relevant for the labor market's perception of CEO quality. Moreover, it reaffirms our earlier findings indicating that incumbent CEOs are more likely to be held responsible for the company's demise than replacement CEOs.

Recall from our discussion of Table 9 above that the enhanced creditor control rights that come with Chapter 11 filing appear to influence the CEO turnover decision. This effect shows up also in Table 10. Compared to the probability of staying with the firm, the probability of leaving without finding new full-time executive employment increases during bankruptcy reorganization: the coefficient on *During bankruptcy* is weakly significant in models (1) and (2), and highly significant in model (3), which is restricted to the sample of non-prepacks. DIP financing is also associated with a higher probability of leaving the firm without receiving new full-time executive position, as is *Fraud*. These findings are consistent with the inference discussed above that some creditors may be adding pressure on poorly performing CEOs to leave during bankruptcy.

Finally, note that most coefficients in Table 10 are statistically insignificant for the outcome that the CEO departs to a new full-time executive position. This suggests that the determinants of this particular outcome largely overlap with the characteristics predicting the probability that the CEO remains with the restructured firm (the baseline outcome in the regression). If this interpretation is correct, it also suggests that CEOs departing for new executive positions and those who stay with the distressed firms are of similar (and possibly high) quality. This interpretation is also consistent with the significantly negative coefficient on trade debt: recall from Table 9 that the probability of forced turnover is lower for firms with large trade credits. Trade creditors may actively influence high-quality CEOs to stay with the bankrupt firm in order to maintain valuable supplier relationships. However, it is also possible that dispersed trade creditors face coordination problems which ultimately lowers the likelihood of forced CEO departure.

## 5 Determinants of changes in CEO compensation and human capital

In this section we first examine the cross-sectional determinants of the total compensation packages at the bankrupt firm. We then analyze the determinants of the change in departed CEOs' income and human capital.

### 5.1 CEO compensation at the bankrupt firm

Table 11 shows the coefficients estimates from ordinary least squares (OLS) regressions of the natural logarithm of CEO total compensation (models (1) to (4)) and tobit regressions for the proportion of cash as opposed to equity pay (models (5) and (6)). The sample comprises 1,183 firm-years from year -3 through Emergence+1. The explanatory variables are the CEO, firm and bankruptcy characteristics used before. In the light of the univariate results in Table 8, we also control for possible compensation differences between incumbent CEOs and external and internal hires. Hence, models (2), (3), (4) and (6) replace *Incumbent* with two dummy variables for internal and external replacement CEOs. All regressions include (unreported) FF12 industry dummies.

As shown in Table 11, CEO total compensation increases with firm size and decreases with CEO age and equity ownership, consistent with the broader compensation literature. Moreover, top executive compensation tends to be higher for firms with relatively high cash balances and lower for firms in

distressed industries, indicating that CEO pay varies with the firm's and industry's financial performance and liquidity. The average compensation is higher for firms with subsequent fraud allegations (revealed during bankruptcy). One possible explanation is that CEOs of firms with fraud allegations are able to extract rents prior to leaving (as shown in Table 12 below, these CEOs experience relatively large income losses subsequent to departure).

While prepack firms tend to have greater going-concern value and debt recovery rates (Tashjian, Lease, and McConnell, 1996; Thorburn, 2000), the variable *Prepack* enters the regression with a negative sign (significant at the 5% level). In other words, controlling for firm and CEO characteristics, the average CEO pay is somewhat lower in prepack firms (there is some evidence of this also in the unconditional compensation averages reported earlier in Table 8). Furthermore, in model (1), the coefficient for *Incumbent* is positive (significant at the 5% level), indicating that incumbent CEOs on average are paid more than replacement CEOs. Moreover, also consistent with the earlier univariate evidence in Table 8, model (2) shows that internal replacement CEOs are paid significantly less than incumbent CEOs.

As explained above, because of the potential endogeneity of the prepack decision, model (3) excludes 384 observations for firms filing prepackaged bankruptcy. All results hold with one exception: the coefficient for external replacement CEO is now insignificant. Focusing on model (4), which is restricted to the subsample of 384 firm-years of prepackaged filings, the coefficient for external replacement CEO is positive and highly significant. Also, consistent with the univariate results in Table 8, the higher pay received by external hires is limited to prepacks, while the lower pay for internally promoted CEOs is significant for regular bankruptcy filings.<sup>26</sup> While age and firm size still produce significant coefficients within the prepack sample in model (4), the variables *Cash*, *IndDistress* and *Fraud* fail to explain any of the cross-sectional variation in CEO compensation.

Turning to columns (5) and (6), the proportion of the total compensation package that is paid in the form of cash increases with age. Moreover, *Chairman* enters the regression with a negative sign, while *Tenure* and *Ownpct* produce positive coefficients. Relatively large firms typically pay a lower proportion of the CEO total compensation in cash, which is consistent with evidence from the general compensation literature. The fraction of cash is also lower for firms with fraud allegations, and higher during bankruptcy reorganization. Neither *Incumbent*, nor the two dummies for internal and external

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<sup>26</sup>Of the 194 external replacements, one-third were hired by firms filing a prepack.

replacement CEOs receive significant coefficients.<sup>27</sup>

## 5.2 Changes in income and human capital of departed CEOs

Table 12 reports the coefficient estimates from median (quantile) regressions for the dollar income change (models (1) to (3)) and the PV income change (models (4) to (6)) of departed CEOs.<sup>28</sup> The sample comprises 407 executives that leave the CEO position with the distressed firm between year -2 and Emergence+1. The explanatory variables are the CEO and bankruptcy characteristics discussed above. We also include two dummy variables that indicate whether the departure is forced or not (*Forced*), and whether the CEO receives new full-time executive employment or not (*Rehired*). Models (2), (3), (5) and (6) add firm characteristics from the year prior to filing, reducing the sample size to 312 departed CEOs.

The coefficient estimates in Table 12 produce qualitatively similar inferences across the two dependent variables. Confirming the univariate analysis in Table 7 above, the coefficient for *Rehired* is positive and highly significant in all regression models. That is, conditional on departing the distressed firm, CEOs that find new full-time executive employment experience a significantly smaller income loss than CEOs who fail to do so. Moreover, there is some (albeit weakly significant) evidence that incumbent CEOs tend to suffer greater income losses. That is, controlling for any subsequent executive employment, the incumbents experience a larger decline in their median total compensation. Also, the income change is increasing in CEO age and decreasing in firm size. In other words, relatively young CEOs and CEOs of large firms tend to suffer a greater income loss. Finally, there is some evidence that CEOs of firms with fraud allegations typically experience a larger income drop after departure.

## 6 CEO loss of equity capital around Chapter 11 filings

Executives of bankrupt firms also experience a loss of the value of personal equity holdings. Adding information on the CEO equity losses provides a more complete picture of the CEO's personal costs of going through corporate bankruptcy. In this section, we provide information on CEO equity holdings (shares and unexercised options) in our sample bankrupt firm using the year-end values reported by the

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<sup>27</sup>While not shown in Table 11, all inferences hold for the elimination of prepack cases.

<sup>28</sup>We use quantile regressions to analyze the determinants of the median, as in section 3 above. Our main regression results remain qualitatively the same if we use OLS estimation.

company.

Table 13 documents the value of the sample CEOs' stock (columns (2) to (5)) and option holdings (columns (6) and (7)) in event time, and we focus on the median equity holdings (columns (4), (5) and (7)). Panel A traces the sample firms in event time, replacing departed CEOs with newly hired CEOs through time. As shown in columns (4) and (5), the median CEO owns 1.9% of the distressed firm's shares in year -3, worth \$5.6 million. The median CEO stock ownership declines only slightly in percentage terms—but substantially in value—as the firm approaches bankruptcy.

In the fiscal year prior to bankruptcy filing, the median CEO owns an equity stake worth \$1.0 million, representing 1.5% of the shares outstanding, which drops towards a value of zero in the year of bankruptcy filing. After emergence from bankruptcy, CEOs are awarded new equity grants in the restructured firm. In the year after emergence, the median CEO owns 0.8% of the firm's shares, worth \$2.2 million. Column (7) shows that the median CEO's option holdings are largely out-of-the-money already three years prior to filing and remain worthless through the end of the event window.

To eliminate the confounding effects in Panel A from the entry of CEOs without any prior equity ownership in the firm, Panel B of Table 13 limits the sample to incumbent CEOs. As some of these CEOs depart, their firms are eliminated from the sample. The median value of incumbent CEO stock holdings also declines substantially in value: from \$5.6 million and \$6.3 million in years -3 and -2, respectively, to \$2.4 million in year -1 and zero in the year of filing. Interestingly, there is no corresponding decline in the median ownership stake of incumbent CEOs prior to bankruptcy filing—if anything there is a slight increase from 1.9% in year -3 to 2.3% in year -2 and 2.6% in year -1.

Panel C addresses potential concerns with survivorship bias in Panel B by limiting the sample to 133 incumbent CEOs that remain at the helm of the firm in the year of bankruptcy filing. Again, the typical CEO in this subsample does not appear to sell shares in the bankrupt firm prior to bankruptcy filing. Conditional on remaining CEO at filing, the median share ownership of incumbent CEOs is stable around 3% in the three years prior to filing. This finding raises an interesting possibility: that equity compensation helps incentivize the CEO to remain with the firm in an attempt to save the firm from bankruptcy.

Panel D of Table 13 confirms that replacement CEOs typically own less equity than incumbent CEOs. In years -2 and -1, the median replacement CEO owns 0.6% and 0.5%, respectively, of the firm's stock, valued at \$1.0 million and \$0.2 million, respectively. Thus, the typical replacement CEO does not lose

much equity value in the distressed firm.

Figure 3 plots the median CEO stock ownership in percent (Panel A) and \$ million (Panel B) from year -3 through three years after emergence. As in Panel A of Table 13, as a CEO leaves the firm, he drops out of the sample and is replaced by a newly hired CEO. For comparison, the dotted line plots the CEO stock ownership for industry-size matched firms from ExecuComp. As shown in Panel A, matching firm CEOs have a median stock ownership of about 0.6% in year -3, which remains relatively stable over the event window. The typical CEO in our sample has a much higher equity ownership of 2% three years prior to filing, which drops to 0.5% as the firm files for bankruptcy. As discussed above, this decline may be driven by relatively low equity awards in distressed firms and the entrance of replacement CEOs with little prior equity ownership in the firm. Consistent with Panel A of Table 13, as sample firms emerge from bankruptcy, CEOs are awarded new equity grants so that three years after emergence, the median CEO owns 1.1% of the restructured firm.

Recall from panels A and C of Table 13 that the fraction of shares owned by incumbent CEOs is relatively stable prior to bankruptcy, while the value of equity declines sharply as the firm approaches bankruptcy. Panel B of Figure 3 shows that the median CEO share ownership similarly declines in value from \$5.6 million in year -3 to \$4.0 million in year -2 and to a value close to zero when the firm files for bankruptcy. As restructured firms emerge from bankruptcy and their CEOs receive new equity grants, the median value of CEO stock holdings increases to \$2.2 million in the year after emergence and \$4.2 million two years later. Note also that the median value of the matched firm CEOs' share holdings fluctuate between \$5.0 and \$7.8 million over the event window, despite a relatively stable share ownership fraction.

Overall, this evidence indicates that incumbent CEOs suffer substantial losses on their equity holdings as the distressed firm approaches bankruptcy. Yet, CEOs who remain with the firm do not appear to sell their shares. Once the firm is restructured and emerge from bankruptcy, CEOs that remain with the firm experience a quick recovery of their equity positions through new equity grant awards. These grants may help the restructured firms provide 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 for employees, 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 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, which marks the beginning of a market-oriented era of Chapter 11 proceedings. The estimates account for executives' employment after bankruptcy filing which has been missing in the extant literature. 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 leaves the firm without finding new executive employment.

We show that nearly half of the total sample of 642 CEOs, and one-third of the 322 incumbent CEOs, maintain full-time executive positions at the restructured firm or after departing to a new company. Moreover, in this group, the median CEO experiences no discernible change in total annual compensation or human capital (the present value of income change to retirement age). In other words, we find no evidence that the labor market penalizes this group of CEOs for failing to avoid bankruptcy. There is even some evidence of a positive compensation change for the median replacement CEO, perhaps reflecting the value of the experience gained by steering the company through the restructuring process.

In contrast, in the group of executives failing to maintain full-time executive employment, the median CEO experiences a total compensation loss equal to 4.8 times the pre-departure income. In present value terms, this constitutes a human capital loss of \$6.5 million when discounted at 10% until retirement age. Across the full sample of CEOs, the median human capital loss is -\$3.2 million or 3.1 times the pre-filing income.

We also show that CEO turnover increases as the distressed firm restructures inside bankruptcy. Some of the forced turnover is associated with control rights held by pre-petition lenders through the DIP financing facility. At the same time, the likelihood of forced CEO turnover is lower when a large

fraction of the firm's liabilities are trade credits. The apparent influence of lenders on the CEO turnover decision is consistent with the significant shift in control rights from shareholders to creditors of financially distressed firms over the past two decades.

CEO equity losses prior to Chapter 11 filing are substantial. Three years prior to filing, the median value of the CEO's stock holding is \$5.6 million. This value drops to \$1 million in year -1, and to zero upon filing. While it is debatable whether the entire 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), the loss of \$1 million from year -1 is most likely unavoidable given fiduciary restrictions on sales. Interestingly, we discover that greater stock ownership lowers the probability that the CEO leaves voluntarily, suggesting that equity ownership helps incentivize managers to remain with the distressed firm in order to turn it around.

An interesting further topic for future research is the relationship between personal CEO costs of corporate bankruptcy and *corporate* bankruptcy costs. For example, while greater resource specialization is typically viewed as giving rise to greater corporate costs 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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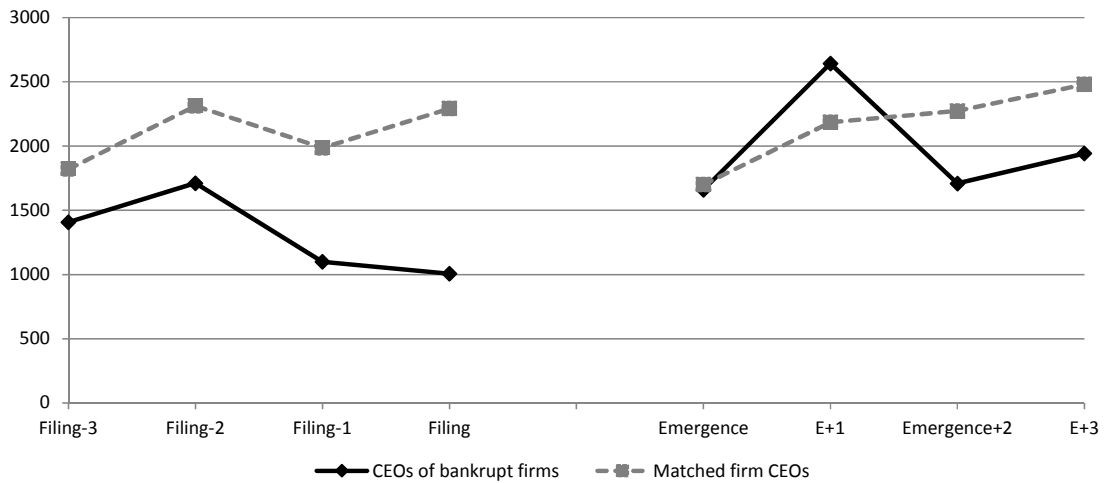
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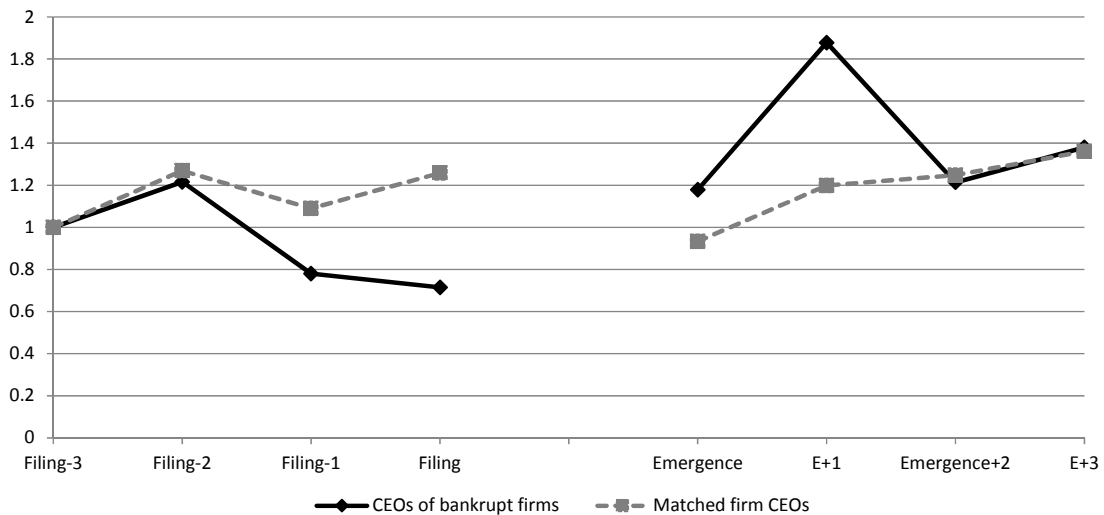
**Figure 1**  
**Median total CEO compensation at the distressed firms, before Ch. 11 filing and after emergence from bankruptcy**

The graphs plot the CEO total pay in event time for 322 large public firms filing for Chapter 11 in the 1996 to 2007 period. Panel A shows the median total pay in \$ thousand, while Panel B shows an index of the median total pay (normalized to 1.0 in event year -3). Total pay is the sum of salary, bonus, long-term incentive plans, other cash compensation, and stock and option grants. After emergence, the plots are restricted to 125 firms that emerge as public firms. We use ExecuComp, 10Ks and proxy filings for the CEO compensation data. The matching firms are from ExecuComp, and are matched on sales, year and two-digit SIC industry code. If the ratio of sales of the sample firm and the matching firm is below 0.7 or exceeds 1.3, the ExecuComp firm is matched on the one-digit SIC industry code.

**A: Median CEO total pay in \$ thousand**

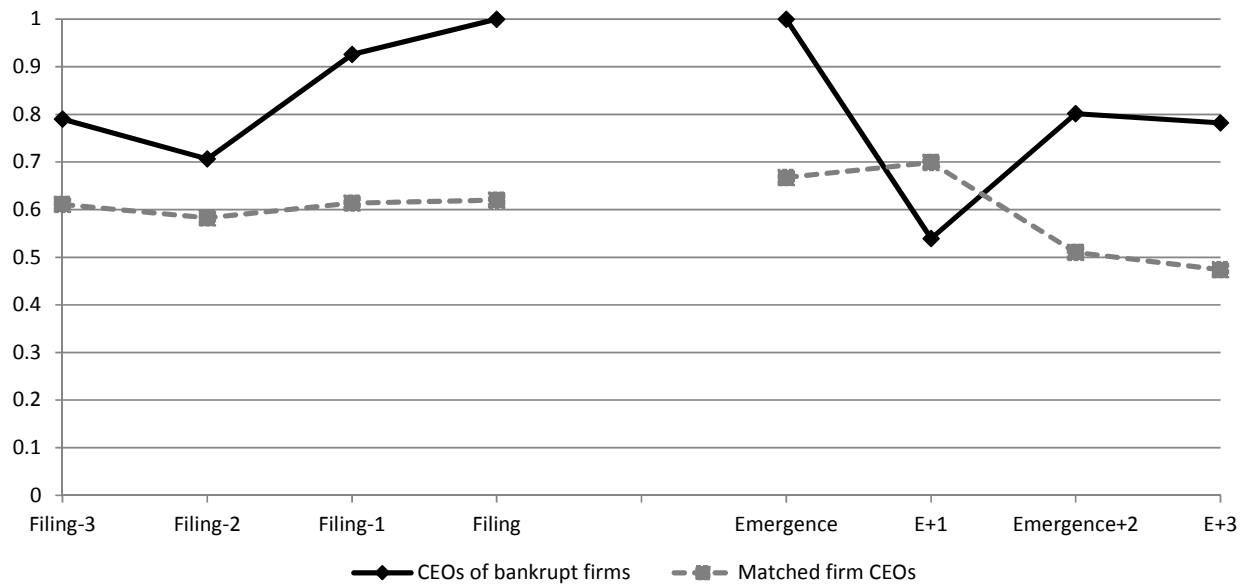


**B: Median CEO total pay index**



**Figure 2**  
**Median proportion of total CEO compensation that is paid in cash, before Ch. 11 filing and after emergence from bankruptcy**

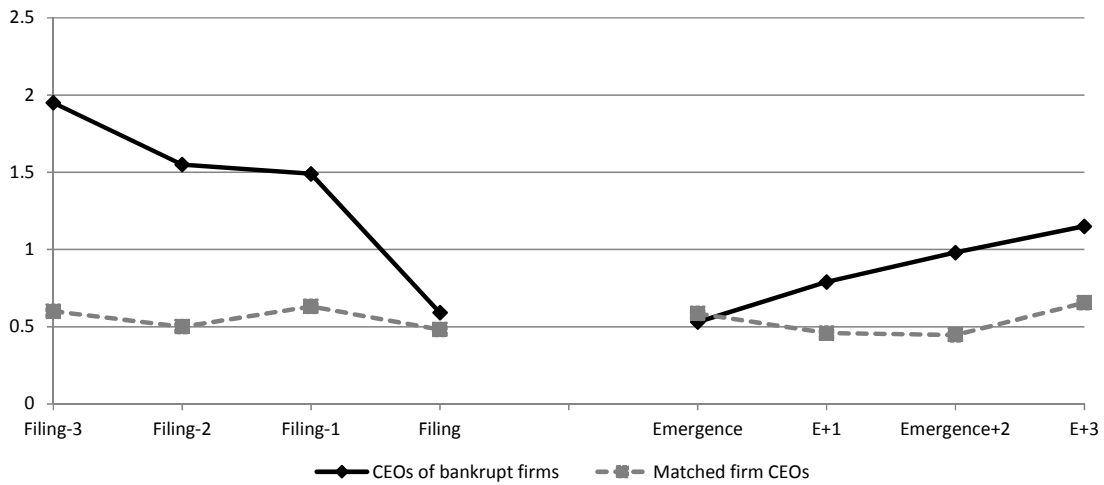
The graphs show the median proportion of CEO total pay in cash in event time relative to Chapter 11 filing and emergence. The sample is CEOs of 322 large public firms that filed for Chapter 11 in the 1996 to 2007 period. After emergence, the plots are restricted to 125 firms that emerge as public firms. We use ExecuComp, 10Ks and proxy filings for the CEO compensation data. The matching firms are from ExecuComp, matched on sales, year and two-digit SIC industry code. If the ratio of sales of the sample firm and the matching firm is below 0.7 or exceeds 1.3, the ExecuComp firm is matched at the one-digit SIC industry code.



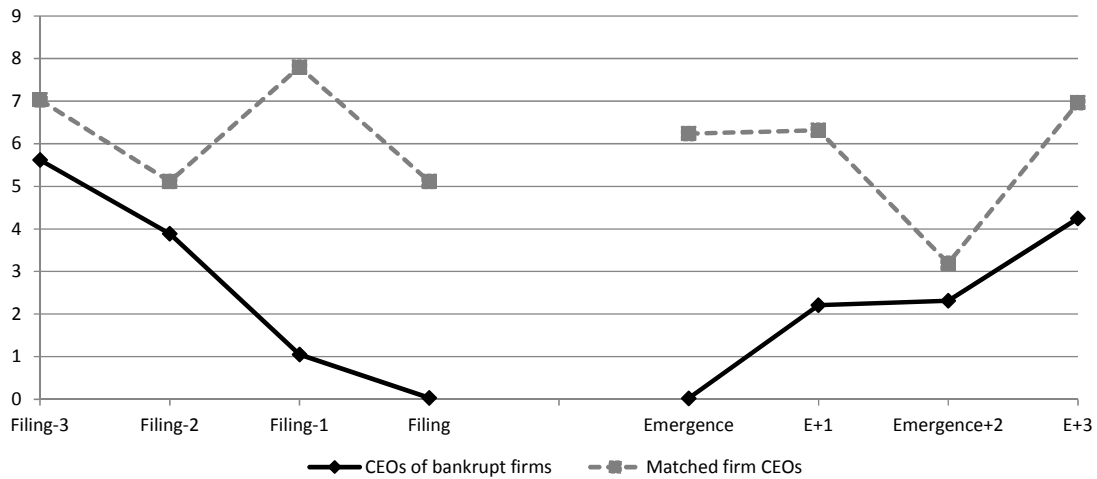
**Figure 3**  
**Median CEO equity ownership in the distressed firms, before Ch. 11 filing and after emergence from bankruptcy**

The graphs show the median CEO equity ownership in event time relative to Chapter 11 filing and emergence. Panel A shows the percent equity ownership and Panel B shows the equity value in \$ million for CEOs of 322 large public firms that filed for Chapter 11 in the 1996 to 2007 period. After emergence, the plots are restricted to 125 firms that emerge as public firms. We use ExecuComp, 10Ks and proxy filings for the CEO equity ownership data. The matching firms are from ExecuComp, matched on sales, year and two-digit SIC industry code. If the ratio of sales of the sample firm and the matching firm is below 0.7 or exceeds 1.3, the ExecuComp firm is matched at the one-digit SIC industry code.

**A: Median CEO share ownership in percent**



**B: Median CEO share ownership \$ million**



**Table 1**  
**Annual distribution of 322 public companies filing for Chapter 11, 1996-2007**

The table shows selected characteristics of the sample firms, classified by the year of filing for Chapter 11 bankruptcy. Sales and book value of total assets are in constant 2009 U.S. dollars, and from the last fiscal year prior to filing. All variables are defined in Appendix Table 1.

Year of filing	N	Sales (\$ mill.)		Total assets (\$ mill.)		Duration <sup>a</sup> (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	13	1,665	641	1,274	464	23.1	17.5	31	85	15	0
1998	25	728	389	752	503	19.3	14.1	28	68	24	8
1999	32	1,320	641	1,655	842	16.3	9.4	38	59	34	6
2000	51	1,448	779	1,481	633	22.9	19.6	22	57	31	12
2001	58	4,051	805	4,164	1,346	17.8	13.1	17	53	36	10
2002	54	3,846	1,009	7,326	1,195	13.2	8.4	46	63	19	18
2003	33	1,151	741	2,180	778	15.0	9.7	30	73	18	9
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	7	2,244	1,179	1,859	497	9.2	5.5	71	100	0	0
2007	9	22,329 <sup>b</sup>	545	4,178	705	10.2	11.6	33	44	56	0
All	322	\$3,070	\$778	\$3,450	\$847	16.9	12.8	30%	64%	26%	10%

<sup>a</sup> 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 4 months).

<sup>b</sup> In 2007, American Home Mortgage Investment Corp. filed with \$194 billion in assets.

**Table 2**  
**CEO departures and replacement hires around Chapter 11 bankruptcy filing**

The table shows the number of CEOs that enter and leave the sample by fiscal year relative to bankruptcy filing (0 is the filing year) and emergence. Of the bankruptcy cases, 84 are resolved in year 0, 129 in Filing+1, 76 in Filing+2, and 33 in Filing+3 through Filing+9. *After emergence* is limited to firms emerging from bankruptcy as independent restructured companies. The sample consists of 322 large public firms filing for U.S. Chapter 11 in the 1996 to 2007 period, with a total of 642 unique CEOs. There are 322 incumbent CEOs (in place at the end of year -3) and 320 replacement CEOs (replacing an incumbent or a previously hired replacement CEO). An internal replacement CEO has been employed by the firm prior to the promotion to CEO. All other replacement CEOs are labeled external. A CEO enters the sample by being appointed CEO and departs by leaving the CEO position at the sample firm.

Event year	No. of sample firms (1)	No. of incumbent CEOs (2)	No. of entering replacement CEOs			No. of departing CEOs			
			All (3)	Internal (4)	External <sup>a</sup> (5)	All (6)	Incumbents (7)	Replacements Internal (8) External (9)	
<b>Before bankruptcy:</b>									
-3 <sup>b</sup>	319	322							
-2	322	262	60	29	31	60	60	0	0
-1	322	193	83	37	46	83	69	5	9
<i>Subtotal before bankruptcy</i>			143	66	77	143	129	5	9
<b>During bankruptcy:</b>									
Filing (0)	322	138	98	37	61	98	55	23	20
Filing+1	238	99	33	9	24	91	39	21	31
Filing+2	109	70	12	4	8	50	29	6	15
Filing+3 through Filing+9	33 <sup>c</sup>	4	64	2	2	20	6	7	7
<i>Subtotal during bankruptcy</i>			147	52	95	259	129	57	73
<b>After emergence:</b>									
Emergence+1 <sup>d</sup>	205	45	30	8	22	45	19	12	14
Total			320	126	194	447	277	74	96

<sup>a</sup> News articles describe 68 of the external replacement CEOs as restructuring specialists. Two-thirds have prior CEO experience.

<sup>b</sup> Of the total sample of 322 public firms, three went public in year -2.

<sup>c</sup> There are a total of 62 firm-years for the 33 firms in the period Filing+3 through Filing+9.

<sup>d</sup> We are unable to identify the replacement CEOs for 15 firms in year Emergence+1.



**Table 3**  
**Stated reasons for CEO turnover**

The table shows the frequency distribution across different reasons that were cited in the news or company press releases when the CEO left the bankruptcy firm. The sample comprises 447 departed CEOs of 322 large public firms filing for U.S. Chapter 11 in the 1996 to 2007 period, hired in or prior to the year of emergence, and leaving their CEO position before year-end Emergence+1. An incumbent CEO is in place at the end of year -3. A replacement CEO replaces an incumbent or a previously hired replacement CEO. An internal replacement CEO has been employed by the firm before the promotion to CEO. All other replacement CEOs are labeled external.

	All CEOs		Incumbent CEOs		Replacement CEOs					
					All		Internal		External	
	N	%	N	%	N	%	N	%	N	%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All CEO turnover	447	100%	277	100%	170	100%	74	100%	96	100%
<u>Forced turnover:</u>										
Pressured by board, shareholders or creditors	63	14	45	16	18	10	12	16	6	6
Performance related	16	3	13	5	3	2	0	0	3	3
<i>All forced turnover</i>	79	18%	58	21%	21	12%	12	16%	9	9%
<u>Voluntary turnover:</u>										
Resigned for personal reasons	93	21	62	22	31	18	16	22	15	16
Liquidation or acquisition	84	19	41	15	43	25	20	27	23	24
Retirement or normal succession	68	15	57	21	11	6	7	9	4	4
Pursue other interests	50	11	26	9	24	14	5	7	19	20
Other reasons	29	6	8	3	21	12	4	5	17	18
Death or illness	2	0	1	0	1	1	1	1	0	0
No reason given	42	9	24	9	18	11	9	12	9	9
<i>All voluntary turnover</i>	368	82%	219	79%	149	88%	62	84%	87	91%

**Table 4**  
**Severance paid to departed CEOs**

The table shows the severance payment in thousands of constant 2009 dollars for departed CEOs. The mean and median severance pay is conditional on receiving severance. Contractual severance is based on existing contracts, while discretionary severance is negotiated upon departure. Columns (8) and (10) show the severance payment in percent of the CEO's compensation at the bankrupt firm. The sample comprises 447 CEOs who leave their position in year -2 through Emergence+1 at 322 large public U.S. firms filing for Chapter 11 in the 1996 to 2007 period (the filing year is denoted 0). All variables are defined in Appendix Table 1. The p-value (in parenthesis) is from a *t*-test (Wilcoxon Signrank test) for the difference in mean (median).

	<i>N</i>	% CEOs receiving severance	Contractual severance		Discretionary severance		Total severance and in % of total pay			
			mean	median	mean	median	mean	%	median	%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>A: All departed CEOs</b>										
All departed CEOs	447	28%	1,748	539	1,932	396	3,680	612%	1,635	300%
<b>B: Severance by subsequent employment</b>										
New full-time exec. position	111	39	1,603	806	1,305	314	2,907	481	2,027	211
No new executive position	336	24	1,824	405	2,258	481	4,081	678	1,604	347
p-value of difference		(0.002)	(0.773)	(0.392)	(0.458)	(0.341)	(0.440)	(0.387)	(0.701)	(0.328)
<b>C: Severance by incumbent vs. replacement CEOs</b>										
Incumbent CEO	277	29	1,811	432	2,470	533	4,281	695	1,997	344
Replacement CEO	170	25	1,631	667	933	44	2,563	465	1,277	229
p-value of difference		(0.411)	(0.813)	(0.708)	(0.228)	(0.045)	(0.255)	(0.303)	(0.102)	(0.368)
<b>D: Severance by forced vs. voluntary turnover</b>										
Forced turnover	79	43	2,801	995	4,091	1,241	6,893	803	2,912	502
Voluntary turnover	368	24	1,332	452	1,078	313	2,410	534	1,290	225
p-value of difference		(0.001)	(0.067)	(0.293)	(0.025)	(0.027)	(0.004)	(0.255)	(0.002)	(0.014)

**Table 5**  
**CEO employment changes around bankruptcy filing**

The table shows the employment of 607 CEOs of 322 large public firms filing for U.S. Chapter 11 in the 1996 to 2007 period that were hired in or prior to the year of emergence. The 447 departed CEOs left their CEO position before year-end Emergence+1. An incumbent CEO is in place at the end of year -3. A replacement CEO replaced an incumbent or a previously hired replacement CEO. An internal replacement CEO has been employed by the firm before the promotion to CEO. All other replacement CEOs are labeled external.

	All CEOs		Incumbent CEOs		Replacement CEOs					
					All		Internal		External	
	N	%	N	%	N	%	N	%	N	%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
New employment										
<b>A: All CEOs</b>										
Total sample	607	100%	322	100%	285	100%	116	100%	169	100%
Remain CEO in Emergence+1	160	26	45	14	115	41	42	36	73	43
Remain CEO in Emergence+1 or become full-time executive at another firm	271	45	102	32	169	60	64	56	105	62
<b>B: Departing CEOs</b>										
All departing CEOs	447	100%	277	100%	170	100%	74	100%	96	100%
CEO at public firm	23	5	15	5	8	5	4	5	4	4
CEO at private firm	42	9	23	8	19	11	5	7	14	15
Non-CEO executive at public firm	14	3	2	1	12	7	6	8	6	6
Non-CEO executive at private firm	32	7	17	6	15	9	7	9	8	8
<i>Subtotal new full-time executive position</i>	111	25%	57	21%	54	32%	22	30%	32	33%
Non-executive director	81	18	58	20	23	14	6	8	17	18
Consultant, politician or self-employed	73	16	44	16	29	17	11	15	18	19
No new employment <sup>a</sup>	182	41	118	42	64	38	35	47	29	30
<i>Subtotal no new full-time exec. employment</i>	336	75%	220	79%	116	68%	52	70%	64	67%

<sup>a</sup> In this category, 28 departed CEOs maintained honorary chairman position on the board, 36 were found to have retired or died, 11 went to prison or were under investigation, one went to pursue a degree, and the remaining 106 (17% of the total CEO sample) cannot be located in the public domain within three years after departure.

**Table 6**  
**Methodology for estimating CEO compensation from new employment**

The table describes the methodology used to estimate the departed CEO's income from 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 (in mentioned order). The sample size  $N$  indicates the number of cases in each category after we have eliminated 63 cases with missing or zero pre-turnover total pay.

Type of new employment	$N$	Methodology for estimating income at the new firm
<b>A: Retain the CEO position:</b>		
Retain CEO position at firm emerging as public firm	78	The actual CEO pay in ExecuComp or collected manually from proxy statements and 10-Ks on Edgar. We take the average compensation in years Emergence+1 and Emergence+2 when available, or else the total compensation in Emergence+1. The actual pay is similar to that of matched public firms.
Retain CEO position at firm emerging as private firm	57	The CEO pay for an industry-size matched firm in ExecuComp in year Emergence+1, adjusted with a 20% private firm discount following Gao, Lemmon, and Li (2011).
<b>B: New executive position:</b>		
CEO at public firm	20	The average of the actual CEO pay of the first two years of employment at the new firm in ExecuComp, or from proxy statements and 10-Ks. The actual pay is similar to that of matched public firms.
Non-CEO executive at public firm	12	The average of the actual pay of the first two years of employment at the new firm from proxy statements and 10-Ks, or the average pay for the new firm's non-CEO executives from ExecuComp. The actual pay is similar to that of matched public firms.
CEO at private firm	38	The CEO pay for an industry-size matched firm in ExecuComp in the first year of employment at the new firm, adjusted with a 20% private firm discount following Gao, Lemmon, and Li (2011).
Non-CEO executive at private firm	28	The non-CEO executive pay for an industry-size matched firm in ExecuComp in the first year at the new firm, adjusted with a 20% private firm discount following Gao, Lemmon, and Li (2011).
<b>C: No new executive position:</b>		
Non-executive director	75	We estimate director pay from regressions of firms' average annual director pay in ExecuComp for the period 2005 to 2012. The explanatory variables are the firm's sales, assets or employees, and industry dummies at the two-digit SIC code level. We apply the coefficient estimates to compute director pay using the size of the firm where the departed CEO becomes a director. See Appendix Table 2 for the coefficient estimates in the director pay regressions.
Consultant, politician, or self-employed	66	A total pay of \$500,000 in 2009 dollars. This is the typical consulting contract offered to departed CEOs and the average salary paid to principals at large consulting companies over the sample period.
No new employment	170	An income of zero.

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

The table shows estimates of the dollar and percent change in CEO total compensation and present value (PV) income change in thousands of constant 2009 dollars. Income change is the difference in total compensation at the "new" firm (see Table 6) and the "old" firm. The income at the old firm is from year -3 (or, if missing, year -2) for incumbent CEOs and, for replacement CEOs, in the year of joining or the average of the first two years, if available. PV income change is the present value of the income change until age 65, discounted at a 10% rate and adjusted for severance and the time to new employment. Multiple is the ratio of PV income change and the CEO's total pay at the distressed firm. The p-values are from two-tailed t-tests (Wilcoxon signrank tests) of the difference in mean (median) between incumbent and replacement CEOs. The sample is 135 CEOs that remain one year after emergence and 409 CEOs that leave their position at 322 large public firms filing for U.S. Chapter 11 bankruptcy in the 1996 to 2007 period.

	N	Income change				PV income change			
		Mean		Median		Mean		Median	
		\$ thousand	%	\$ thousand	%	\$ thousand	multiple	\$ thousand	multiple
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
<b>A: All CEOs</b>									
All CEOs	544	-2,980	-4	-940	-88	-19,087	3.2	-3,159	-3.1
Incumbent CEOs	311	-4,479	-32	-1,234	-94	-28,228	-1.6	-4,781	-3.8
Replacement CEOs	233	-979	33	-478	-54	-6,858	9.5	-2,175	-2.2
p-value of difference		0.047	0.000	0.000	0.000	0.115	0.066	0.000	0.001
<b>B: Remain CEO at sample firm in Emergence+ 1 or depart for new full-time exec. position</b>									
All CEOs	233	133	109	132	16	-616	13.4	210	0.2
Incumbent CEOs	98	-746	92	-51	-5	-4,412	4.4	0	0.0
Replacement CEOs	135	771	121	262	24	2,124	19.9	674	0.8
p-value of difference		0.077	0.445	0.052	0.050	0.208	0.270	0.111	0.098
<b>C: Remain CEO at sample firm in year Emergence+1</b>									
All CEOs	135	43	88	260	24	249	5.4	652	0.8
Incumbent CEOs	44	-390	71	171	27	1,493	5.8	810	1.1
Replacement CEOs	91	253	96	262	16	-353	5.2	652	0.8
p-value of difference		0.540	0.562	0.583	0.616	0.791	0.808	0.782	0.690
<b>D: Depart for new full-time executive positions</b>									
All CEOs	98	256	137	-11	0	-1,857	24.9	-529	-0.9
Incumbent CEOs	54	-1,036	109	-272	-22	-9,408	3.2	-1,102	-1.5
Replacement CEOs	44	1,842	172	214	38	7,491	51.7	1,040	2.1
p-value of difference		0.056	0.361	0.046	0.056	0.042	0.150	0.037	0.032
<b>E: Depart with no new full-time executive position</b>									
All CEOs	311	-5,312	-89	-1,471	-100	-33,000	-4.5	-6,524	-4.8
Incumbent CEOs	213	-6,196	-90	-1,609	-100	-39,168	-4.3	-7,235	-4.6
Replacement CEOs	98	-3,390	-89	-1,208	-100	-19,432	-4.9	-5,277	-5.3
p-value of difference		0.380	0.784	0.073	0.831	0.430	0.139	0.702	0.168

**Table 8**  
**Compensation of departing and replacement CEOs at the bankrupt firm**

The table shows the compensation packages of departing CEOs in the year before they leave and of replacement CEOs in the year they are hired. Total compensation is in 2009 \$ thousand. Panel A presents statistics for all departing and replacement CEOs. In Panels B and C, the samples are non-prepackaged and prepackaged bankruptcy filings, respectively. An internal replacement CEO has been employed by the firm before the promotion to CEO. All other replacement CEOs are labeled external. The p-values (in parenthesis) are from a two-tailed *t*-test (Wilcoxon signrank test) of the difference in mean (median) between departing and replacement CEOs. Tests of significance of the difference between internal and external replacement CEOs are also reported.

	Departing CEOs			Replacement CEOs			p-value of difference	
	<i>N</i>	mean	median	<i>N</i>	mean	median	mean	median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>A: All CEOs</b>								
<i>Total compensation:</i>								
Internal replacement	122	2,875	1,223	107	1,904	920	(0.008)	(0.003)
External replacement	188	5,563	1,259	167	4,931	1,449	(0.730)	(0.492)
p-value of difference					(0.007)	(0.012)		
<i>Proportion cash pay:</i>								
Internal replacement	122	0.72	0.97	107	0.74	0.94	(0.369)	(0.659)
External replacement	188	0.75	1.00	167	0.60	0.69	(0.000)	(0.001)
p-value of difference					(0.002)	(0.006)		
<b>B: Non-Prepack</b>								
<i>Total compensation:</i>								
Internal replacement	80	2,870	1,269	65	2,285	1,113	(0.052)	(0.011)
External replacement	125	7,140	1,517	107	4,442	1,514	(0.420)	(0.512)
p-value of difference					(0.016)	(0.009)		
<i>Proportion cash pay:</i>								
Internal replacement	80	0.74	0.98	65	0.76	0.94	(0.646)	(0.717)
External replacement	125	0.71	0.93	107	0.62	0.81	(0.051)	(0.124)
p-value of difference					(0.138)	(0.197)		
<b>C: Prepack</b>								
<i>Total compensation:</i>								
Internal replacement	42	2,885	1,157	42	1,314	806	(0.066)	(0.088)
External replacement	63	2,432	843	60	5,802	1,398	(0.049)	(0.035)
p-value of difference					(0.063)	(0.003)		
<i>Proportion cash pay:</i>								
Internal replacement	42	0.67	0.96	42	0.73	0.94	(0.435)	(0.696)
External replacement	63	0.82	1.00	60	0.56	0.53	(0.001)	(0.002)
p-value of difference					(0.025)	(0.049)		

**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 comprises 1,184 firm-years from year -2 through Emergence+1 for 322 public firms filing for U.S. Chapter 11 bankruptcy in the 1996 to 2007 period. The dependent variable has three outcomes: voluntary turnover, forced turnover, and no turnover (baseline outcome). Model (3) drops 358 firm-years for prepackaged filings. All variables are defined in Appendix Table 1. Included but not reported are FF12 industry dummies. Standard errors are in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Sample:	All ( $N=1,184$ )		All ( $N=1,184$ )		Non-prepacks ( $N=826$ )	
	(1)		(2)		(3)	
Reason for turnover:	Voluntary	Forced	Voluntary	Forced	Voluntary	Forced
Intercept	-3.344*** [0.766]	-6.274*** [1.358]	-3.838*** [0.811]	-7.838*** [1.482]	-4.136*** [1.006]	-6.809*** [1.784]
<b>CEO characteristics:</b>						
<i>Age</i>	0.035*** [0.011]	-0.006 [0.018]	0.037*** [0.011]	-0.000 [0.019]	0.044*** [0.014]	-0.016 [0.024]
<i>Chairman</i>	-0.448*** [0.168]	-0.019 [0.313]	-0.436*** [0.169]	0.044 [0.320]	-0.403* [0.215]	-0.197 [0.381]
<i>Tenure</i>	-0.024 [0.023]	0.017 [0.036]	-0.026 [0.023]	0.008 [0.036]	-0.054* [0.030]	0.024 [0.045]
<i>Incumbent</i>	0.358* [0.207]	1.064*** [0.396]	0.428** [0.213]	1.146*** [0.406]	0.601** [0.278]	1.069** [0.486]
<i>Ownpct</i>	-0.027*** [0.010]	0.004 [0.010]	-0.027*** [0.010]	0.002 [0.010]	-0.031** [0.012]	0.003 [0.012]
<b>Firm characteristics:</b>						
<i>Size</i>	-0.025 [0.060]	0.251** [0.098]	-0.013 [0.063]	0.271** [0.106]	0.006 [0.077]	0.210* [0.121]
<i>Cash</i>	-1.621* [0.845]	-0.324 [1.386]	-1.167 [0.867]	0.823 [1.458]	-1.378 [1.078]	-0.464 [1.808]
<i>Tangibility</i>	0.016 [0.397]	-0.303 [0.782]	-0.001 [0.402]	-0.506 [0.805]	0.064 [0.560]	0.286 [1.070]
<i>Industry adjusted ROA</i>	-1.742*** [0.667]	-1.977* [1.078]	-1.913*** [0.679]	-2.638** [1.126]	-1.949** [0.929]	-3.083* [1.585]
<i>Industry adjusted leverage</i>	0.110 [0.173]	0.467 [0.294]	0.101 [0.183]	0.646** [0.319]	-0.011 [0.230]	0.651 [0.413]
<i>IndDistress</i>	-0.160 [0.254]	-0.535 [0.538]	-0.128 [0.255]	-0.452 [0.550]	-0.130 [0.306]	-0.855 [0.660]
<i>Institution <math>\geq</math> 25%</i>			-0.275 [0.171]	-0.218 [0.303]	-0.178 [0.210]	-0.563 [0.373]
<i>Bond debt <math>\geq</math> 70% of liabilities</i>			-0.028 [0.251]	-0.116 [0.467]	-0.358 [0.378]	-0.589 [0.612]
<i>Trade debt <math>\geq</math> 70% of liabilities</i>			-0.264 [0.213]	-1.032*** [0.399]	-0.384 [0.259]	-1.117** [0.476]
<b>Bankruptcy characteristics:</b>						
<i>During bankruptcy</i>	0.116 [0.175]	1.185*** [0.307]	0.124 [0.177]	1.251*** [0.310]	0.345 [0.219]	1.564*** [0.380]
<i>Prepack</i>	0.308* [0.169]	0.051 [0.329]	0.323* [0.173]	0.030 [0.339]		
<i>Fraud</i>	0.609* [0.359]	1.578*** [0.477]	0.586 [0.361]	1.535*** [0.494]	0.541 [0.487]	2.252*** [0.636]
<i>DIP Financing</i>			0.319 [0.210]	1.050** [0.424]	0.190 [0.300]	1.542** [0.600]
Pseudo- $R^2$	0.073		0.084		0.104	

**Table 10**  
**Determinants of CEO employment changes around bankruptcy filing**

The table shows coefficient estimates from multinomial logit regressions for the probability of CEO turnover and new executive employment after departure. The dependent variable has three outcomes: turnover with new full-time executive position, turnover with no new full-time executive position, and no turnover (baseline outcome). The sample comprises 1,184 firm-years from year -2 through Emergence+1 for 322 public firms filing for U.S. Chapter 11 bankruptcy in the 1996 to 2007 period. Model (3) drops 358 firm-years for prepackaged filings. All variables are defined in Appendix Table 1. Included but not reported are FF12 industry dummies. Standard errors are in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Sample:	All ( $N=1,184$ )		All ( $N=1,184$ )		Non-prepacks ( $N=826$ )	
	(1)		(2)		(3)	
New position after departure:	Executive position	No new position	Executive position	No new position	Executive position	No new position
Intercept	-0.841 [1.356]	-4.951*** [0.780]	-1.191 [1.421]	-5.865*** [0.842]	-0.526 [1.951]	-5.837*** [1.006]
<b>CEO characteristics:</b>						
<i>Age</i>	-0.018 [0.019]	0.038*** [0.011]	-0.014 [0.019]	0.042*** [0.011]	-0.027 [0.027]	0.045*** [0.013]
<i>Chairman</i>	-0.414 [0.286]	-0.349** [0.172]	-0.353 [0.289]	-0.330* [0.173]	-0.322 [0.405]	-0.384* [0.213]
<i>Tenure</i>	-0.109** [0.053]	-0.002 [0.021]	-0.097* [0.052]	-0.007 [0.022]	-0.102 [0.070]	-0.029 [0.027]
<i>Incumbent</i>	0.317 [0.355]	0.624*** [0.214]	0.174 [0.361]	0.750*** [0.221]	0.431 [0.519]	0.848*** [0.276]
<i>Ownpct</i>	-0.010 [0.017]	-0.016** [0.008]	-0.012 [0.018]	-0.017** [0.008]	-0.026 [0.025]	-0.016* [0.009]
<b>Firm characteristics:</b>						
<i>Size</i>	-0.056 [0.112]	0.074 [0.059]	0.019 [0.122]	0.065 [0.062]	-0.053 [0.164]	0.079 [0.072]
<i>Cash</i>	-3.690** [1.817]	-0.624 [0.796]	-2.959 [1.843]	-0.024 [0.819]	-2.810 [2.492]	-0.530 [0.999]
<i>Tangibility</i>	-0.073 [0.677]	-0.011 [0.411]	-0.230 [0.694]	-0.028 [0.417]	0.115 [1.035]	0.131 [0.568]
<i>Industry adjusted ROA</i>	-0.564 [1.211]	-2.234*** [0.662]	-0.790 [1.206]	-2.518*** [0.683]	-0.070 [1.758]	-2.802*** [0.906]
<i>Industry adjusted leverage</i>	0.188 [0.281]	0.167 [0.176]	0.359 [0.300]	0.139 [0.188]	0.498 [0.409]	0.007 [0.232]
<i>IndDistress</i>	-0.666 [0.482]	-0.074 [0.261]	-0.666 [0.488]	0.002 [0.263]	-1.115* [0.678]	-0.011 [0.306]
<i>Institution <math>\geq</math> 25%</i>			-0.279 [0.308]	-0.274 [0.171]	-0.443 [0.405]	-0.231 [0.205]
<i>Bond debt <math>\geq</math> 70% of liabilities</i>			-0.097 [0.416]	0.023 [0.256]	-0.571 [0.672]	-0.346 [0.360]
<i>Trade debt <math>\geq</math> 70% of liabilities</i>			-1.309*** [0.485]	-0.237 [0.209]	-1.894*** [0.695]	-0.340 [0.249]
<b>Bankruptcy characteristics:</b>						
<i>During bankruptcy</i>	0.453 [0.304]	0.322* [0.174]	0.465 [0.304]	0.342* [0.176]	0.823** [0.412]	0.589*** [0.211]
<i>Prepack</i>	0.569** [0.284]	0.163 [0.176]	0.430 [0.293]	0.220 [0.181]		
<i>Fraud</i>	0.013 [0.769]	1.027*** [0.325]	0.039 [0.772]	0.997*** [0.329]	-0.282 [1.157]	1.273*** [0.416]
<i>DIP Financing</i>			-0.206 [0.342]	0.698*** [0.223]	0.267 [0.570]	0.589** [0.297]
Pseudo- $R^2$	0.067		0.082		0.089	



**Table 11**  
**Determinants of CEO compensation at the bankrupt firm**

The table shows coefficient estimates from ordinary least squares (OLS) regressions for the logarithm of CEO total compensation (models (1) to (4)) and Tobit regressions for the proportion of total compensation that is cash pay (models (5) to (6)). Model (3) drops 384 firm-years for prepackaged filings and model (4) drops 799 firm-years for non-prepackaged filings. The sample comprises 1,183 firm-years from year -3 through Emergence+1 for 342 public firms filing for U.S. Chapter 11 bankruptcy in the 1996 to 2007 period. All variables are defined in Appendix Table 1. Included but not reported are FF12 industry dummies. Standard errors are in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent variable:	CEO total compensation				Proportion cash pay	
	All ( <i>N</i> =1,183) (1)	All ( <i>N</i> =1,183) (2)	Non- Prepacks ( <i>N</i> =799) (3)	Prepacks ( <i>N</i> =384) (4)	All ( <i>N</i> =1,183) (5)	All ( <i>N</i> =1,183) (6)
Intercept	6.373*** [0.403]	6.629*** [0.390]	6.288*** [0.463]	7.165*** [0.733]	0.427*** [0.157]	0.442*** [0.151]
<b>CEO characteristics:</b>						
<i>Age</i>	-0.022*** [0.006]	-0.022*** [0.006]	-0.020*** [0.007]	-0.028*** [0.010]	0.008*** [0.002]	0.008*** [0.002]
<i>Chairman</i>	0.096 [0.094]	0.080 [0.094]	-0.027 [0.115]	0.167 [0.177]	-0.078** [0.036]	-0.073** [0.036]
<i>Tenure</i>	0.003 [0.012]	0.004 [0.012]	0.000 [0.014]	0.024 [0.025]	0.014*** [0.005]	0.013*** [0.005]
<i>Incumbent</i>	0.249** [0.115]				0.021 [0.045]	
<i>Internal replacement CEO</i>		-0.433*** [0.141]	-0.566*** [0.174]	-0.307 [0.248]		0.038 [0.055]
<i>External replacement CEO</i>		0.310** [0.138]	0.123 [0.169]	0.807*** [0.247]		-0.098* [0.054]
<i>Ownpct</i>	-0.010*** [0.004]	-0.010** [0.004]	-0.011** [0.004]	-0.006 [0.009]	0.007*** [0.002]	0.006*** [0.002]
<b>Firm characteristics:</b>						
<i>Size</i>	0.309*** [0.032]	0.308*** [0.032]	0.347*** [0.036]	0.224*** [0.068]	-0.029** [0.012]	-0.029** [0.012]
<i>Cash</i>	1.677*** [0.396]	1.704*** [0.395]	1.843*** [0.467]	1.353* [0.770]	0.071 [0.153]	0.062 [0.152]
<i>Tangibility</i>	-0.038 [0.226]	-0.032 [0.225]	-0.067 [0.295]	0.084 [0.380]	0.046 [0.087]	0.044 [0.087]
<i>Industry adjusted ROA</i>	0.369 [0.390]	0.395 [0.389]	0.669 [0.482]	0.181 [0.689]	-0.085 [0.153]	-0.092 [0.153]
<i>Industry adjusted leverage</i>	-0.010 [0.108]	-0.005 [0.107]	-0.009 [0.128]	0.098 [0.200]	0.055 [0.043]	0.054 [0.043]
<i>IndDistress</i>	-0.436*** [0.139]	-0.444*** [0.139]	-0.597*** [0.165]	-0.158 [0.257]	0.097* [0.055]	0.099* [0.054]
<b>Bankruptcy characteristics:</b>						
<i>During bankruptcy</i>	-0.128 [0.111]	-0.140 [0.111]	-0.158 [0.134]	-0.076 [0.200]	0.325*** [0.045]	0.328*** [0.045]
<i>Prepack</i>	-0.203** [0.093]	-0.197** [0.093]			0.064* [0.037]	0.062* [0.036]
<i>Fraud</i>	0.684*** [0.207]	0.687*** [0.206]	0.553** [0.248]	0.598 [0.388]	-0.302*** [0.077]	-0.303*** [0.077]
Adjusted- <i>R</i> <sup>2</sup> / Pseudo- <i>R</i> <sup>2</sup>	0.141	0.144	0.202	0.059	0.097	0.099

**Table 12**  
**Determinants of changes in total compensation and human capital of departed CEOs**

The table shows coefficient estimates from median (quantile) regressions of the departed CEO's income change (models (1) to (3)) and PV income change (models (4) to (6)). *Income change* is the difference in total compensation at the new firm (see Table 6) and at the old (sample) firm. The income at the old firm is from year -3 for incumbent CEOs and, for replacement CEOs, in the year of joining or the average of the first two years, if available. *PV income change* is the present value of the income change until age 65, discounted at a 10% and adjusted for severance and the time to new employment. All variables are defined in Appendix Table 1. The sample comprises 407 CEOs leaving in year -2 through Emergence+1 their position with 322 large public firms filing for U.S. Chapter 11 bankruptcy in the 1996 to 2007 period. Standard errors are in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

Dependent variable:	Income change			PV income change		
	All (N=407) (1)	All (N=312) (2)	Non- prepack (N=204) (3)	All (N=404) (4)	All (N=310) (5)	Non- prepack (N=202) (6)
Intercept	-3.468*** [1.158]	-0.208 [1.426]	0.938 [1.887]	-29.220*** [6.517]	-12.729*** [4.220]	-9.657 [8.298]
<b>CEO characteristics:</b>						
<i>Age</i>	0.040** [0.018]	0.067*** [0.019]	0.058** [0.026]	0.437*** [0.100]	0.493*** [0.057]	0.673*** [0.113]
<i>Chairman</i>	-0.423 [0.295]	-0.365 [0.310]	-0.231 [0.416]	-0.646 [1.653]	-0.440 [0.942]	-0.731 [1.784]
<i>Tenure</i>	0.015 [0.037]	-0.055 [0.041]	-0.081 [0.054]	0.212 [0.195]	-0.192 [0.125]	-0.447* [0.235]
<i>Incumbent</i>	-0.788** [0.359]	-0.352 [0.393]	-0.072 [0.502]	-4.827** [1.998]	-2.893** [1.193]	-1.851 [2.261]
<i>Forced</i>	-0.583 [0.355]	-0.574 [0.365]	-1.761*** [0.477]	-1.843 [1.984]	-2.858** [1.108]	-7.290*** [2.033]
<i>Rehired</i>	1.584*** [0.333]	1.798*** [0.363]	2.143*** [0.491]	6.783*** [1.884]	7.495*** [1.087]	10.676*** [2.189]
<b>Firm characteristics:</b>						
<i>Size</i>		-0.645*** [0.109]	-0.792*** [0.138]		-2.526*** [0.318]	-4.508*** [0.591]
<i>Cash</i>		0.177 [1.730]	-1.679 [2.119]		7.142 [4.557]	8.968 [8.706]
<i>Tangibility</i>		-0.081 [0.730]	1.408 [1.200]		-0.944 [2.217]	-1.468 [5.289]
<i>Industry adjusted ROA</i>		0.167 [1.075]	0.239 [1.866]		-1.811 [3.433]	0.201 [7.344]
<i>Industry adjusted leverage</i>		-0.014 [0.305]	0.228 [0.413]		-0.499 [0.916]	0.389 [1.714]
<i>IndDistress</i>	0.013 [0.443]	0.355 [0.494]	-0.142 [0.618]	-1.674 [2.508]	-1.794 [1.543]	-0.888 [2.840]
<b>Bankruptcy characteristics:</b>						
<i>During bankruptcy</i>	-0.228 [0.298]	0.060 [0.320]	-0.003 [0.405]	-1.457 [1.672]	-0.730 [0.996]	1.938 [1.762]
<i>Prepack</i>	0.796** [0.316]	0.570* [0.330]		2.657 [1.788]	0.335 [0.981]	
<i>Fraud</i>	-1.116* [0.583]	-1.294** [0.596]	-1.603** [0.813]	-6.065* [3.245]	-12.357*** [1.804]	-15.169*** [3.314]
Pseudo- $R^2$	0.054	0.083	0.100	0.054	0.060	0.075

**Table 13**  
**CEO stock and option holdings around Chapter 11 filing**

The table shows CEO stock and option holdings in event time, where 0 is the year of filing. An incumbent CEO is in place at the end of year -3. A replacement CEO is hired to replace a departed CEO. The value is in million of constant 2009 dollars and % is the fraction of the total shares outstanding. Stocks are valued at the year-end stock price and options are valued following Core and Guay (1999). Sample of 322 large public U.S. firms filing for Chapter 11 in the 1996 to 2007 period. All variables are defined in Appendix Table 1.

Year-end	N	Stock ownership				Option holdings	
		mean		median		mean	median
		(in \$)	(in %)	(in \$)	(in %)	(in \$)	(in \$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>A: All CEOs</b>							
-3	266	49.84	7.10	5.62	1.95	5.41	0.01
-2	293	41.27	6.38	3.89	1.55	7.67	0.00
-1	313	16.13	6.56	1.05	1.49	2.46	0.00
0	107	1.68	3.58	0.03	0.59	0.50	0.00
Emergence	113	4.56	1.86	0.08	0.53	0.84	0.00
Emergence+1	101	8.75	1.80	2.21	0.79	1.76	0.00
<b>B: All incumbent CEOs</b>							
-3	266	49.84	7.10	5.62	1.95	5.41	0.01
-2	235	43.11	7.27	6.30	2.34	8.56	0.00
-1	186	18.29	8.64	2.43	2.64	3.88	0.00
0	44	3.86	7.68	0.22	2.20	1.16	0.00
Emergence	35	9.29	2.32	0.03	0.77	1.48	0.00
Emergence+1	20	31.70	2.28	3.41	1.38	3.33	0.00
<b>C: All incumbent CEOs that remain at the beginning of Year 0</b>							
-3	116	51.41	9.18	10.55	2.98	4.26	0.09
-2	127	39.83	8.04	7.40	3.00	10.07	0.00
-1	133	16.08	7.92	2.17	3.15	2.31	0.00
0	44	3.86	7.68	0.22	2.20	1.16	0.00
<b>D: All replacement CEOs</b>							
-3	-	-	-	-	-	-	-
-2	58	33.66	2.76	1.01	0.58	3.84	0.00
-1	127	13.07	3.51	0.21	0.53	0.34	0.00
0	63	0.12	0.71	0.01	0.14	0.03	0.00
Emergence	78	2.51	1.66	0.16	0.34	0.55	0.00
Emergence+1	81	4.11	1.69	2.12	0.70	1.37	0.00

**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 322 large U.S. public firms filing for bankruptcy in the 1996 to 2007 period and resolved by 2011. Year 0 denotes the year of bankruptcy filing. The table uses "BRD" for Bankruptcy Research Database, "BD" for BankruptcyData.com, "Bcy plans" for bankruptcy plans, and "proxy" for proxy statements. Bankruptcy plans are from BD, 8Ks, and various U.S. Bankruptcy Courts. The 10Ks, 8Ks, and proxy statements are from EDGAR and 13Fs are from Thompson Reuters Ownership Database. The mean and median values in Panels A, B, and C are for all sample years, except that the mean and median values of replacement CEO, Internal replacement CEO, and external replacement CEO are for replacement CEOs only and forced turnover, voluntary turnover, rehired, income change, PV income change, separation pay, contractual severance, and discretionary severance variables are for departed CEOs only. Firm size variables and CEO compensation are measured in constant 2009 U.S. dollars. Potentially unbounded firm characteristics are winsorized at the 1% and 99% level.

Variable name	Variable definition	Source	Mean	Median
<b>A. CEO characteristics</b>				
Age	CEO age in years	ExecuComp, 10Ks, proxy	53.172	54
Chairman	Indicator variable taking the value of one if the CEO is Chairman of the board	ExecuComp, 10Ks, proxy	0.553	1
Tenure	CEO tenure with the sample firm in years	ExecuComp, 10Ks, proxy	4.761	3
Incumbent CEO	A CEO in place at the end of fiscal year -3 relatively to filing	10Ks, proxy, Factiva	0.595	1
Ownpct	Percent of common shares owned by the CEO	ExecuComp, 10Ks, proxy	5.321	1.185
Replacement CEO	A new CEO appointed at the sample firm in year -2 through Emergence +1	10Ks, proxy, Factiva	0.283	0
Internal replacement CEO	A replacement CEO, who has been employed by the firm prior to the appointment	10Ks, proxy, Factiva	0.394	0
External replacement CEO	A replacement CEO, who is recruited from the outside	10Ks, proxy, Factiva	0.606	1
Forced turnover	The turnover is performance-related or follows pressure by the board, shareholders or creditors	10Ks, proxy, Factiva	0.177	0
Voluntary turnover	All turnover that is not forced	10Ks, proxy, Factiva	0.823	
Rehired	An indicator variable taking the value of one if a departed CEO subsequently holds new full-time executive employment	Factiva, LexisNexis, LinkedIn, Forbes, S&P Register of Corporations, Directors, and Executives, and web searches	0.248	0

Appendix Table 1 continued from previous page

Variable name	Variable definition	Source	Mean	Median
<b>B. CEO compensation variables</b>				
Cash compensation	Sum of salary, bonus, long-term incentive plans (LTIP), other cash compensation (in \$ thousands)	Execucomp, 10Ks, proxy	1,546	889
Equity grants	Total value of restricted stock and options granted (in \$ thousands)	Execucomp, 10Ks, proxy	2,533	61
CEO total compensation	Sum of cash compensation and equity grants (in \$ thousands)	Execucomp, 10Ks, proxy	4,079	1,380
Proportion cash pay	Fraction of cash compensation (as opposed to equity grants) of total compensation	Execucomp, 10Ks, proxy	0.711	0.919
Total equity	Total value of shares and unexercised (unexercisable and exercisable) options (in \$ millions), valued following Core and Guay (1999)	Execucomp, 10Ks, proxy, CRSP	26.828	1.392
Income change	The difference in CEO total compensation at the new firm (see Table 6) and at the old (sample) firm. The old income is from year -3 or, if missing, year -2 for incumbent CEOs and the average income in the year of joining and the next year (or the year of joining if the latter is missing) for replacement CEOs.	Own computation	-3,892	-1,190
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	Own computation	-25,177	-5,009
Separation pay	Indicator variable taking the value of one is severance pay is provided to the departed CEO	10Ks, proxy, Factiva	0.275	0
Contractual severance	Separation pay based on contract (in \$ thousands), conditional on receiving severance	10Ks, proxy, Factiva	1,748	539
Discretionary severance	Discretionary separation pay including lump-sum cash pay, loan forgiveness, adjustment to pension benefits, consulting contract, and equity incentives, conditional on receiving severance	10Ks, proxy, Factiva	1,932	396
<b>C. Firm characteristics</b>				
Total assets	Book value of total assets (in \$ millions)	Compustat, 10Ks	3,394	922
Sales	Total sales (in \$ millions)	Compustat, 10Ks	2,877	834
Size	Logarithm of total sales (in \$ millions)	Compustat, 10Ks	6.716	6.726
ROA	Ratio of EBITDA to total assets	Compustat, 10Ks	0.039	0.062
Industry adjusted ROA	Firm ROA adjusted by the median ROA for the two-digit SIC industry	Compustat, 10Ks	-0.057	-0.039

Appendix Table 1 continued from previous page

Variable name	Variable definition	Source	Mean	Median
Leverage	Ratio of total liabilities to total assets	Compustat, 10Ks	0.961	0.858
Industry adjusted Leverage	Firm leverage adjusted by the median leverage for the two-digit SIC industry	Compustat, 10Ks	0.405	0.300
Cash	Ratio of cash and short-term investment to total assets	Compustat, 10Ks	0.088	0.045
Tangibility	Ratio of net PP&E to total assets	Compustat, 10Ks	0.368	0.345
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	0.115	0
FF12	The Fama-French 12 industry of the sample firm	CRSP, Ken French's website	-	-
Institution $\geq 25\%$	Indicator variable taking the value of one if the percent shares owned by institutional investors exceed 25% of the total shares outstanding	13Fs	0.323	0
Bond debt $\geq 70\%$ of liabilities	Indicator variable taking the value of one if the face value of bonds exceeds 70% of the total liabilities	Bcy plans, Compustat, CapIQ	0.126	0
Trade debt $\geq 70\%$ of liabilities	Indicator variable taking the value of one if the total liabilities net of bank loans and bonds exceed 70% of the total liabilities	Bcy plans, Compustat, CapIQ	0.217	0
<b>D. Chapter 11 characteristics</b>				
During bankruptcy	Indicator variable taking the value of one for fiscal years of filing through emergence	BRD, BD, Bcy plans	0.385	0
Prepack	Indicator variable taking the value of one if the bankruptcy is prepackaged or pre-negotiated	BRD, BD, Bcy plans	0.304	0
Fraud	Indicator variable taking the value of one if bankruptcy is caused principally by fraud claims (include securities fraud claims) against the company	BRD	0.056	0
DIP financing	Indicator variable taking the value of one if the firm receives debtor-in-possession (DIP) financing	BRD, BD, Bcy plans, Factiva, LexisNexis	0.693	1
Emergence	Indicator variable taking the value of one if the firm subsequently emerges from bankruptcy as an independent entity	BRD, BD, Bcy plans	0.637	1
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, Bcy plans	0.264	0
Acquisition	Indicator variable taking the value of one if the firm is acquired in bankruptcy	BRD, BD, Bcy plans	0.099	0

Appendix Table 1 continued from previous page

<b>Variable name</b>	<b>Variable definition</b>	<b>Source</b>	<b>Mean</b>	<b>Median</b>
Duration	Number of months in bankruptcy, from the date of filing to the date of confirmation of the reorganization plan	BRD, BD, Bankruptcy Plans	16.857	12.767
Emergence+1	The event year after the firm emerges from bankruptcy	BRD, BD, Bcy plans	0.108	0

**Appendix Table 2**  
**Determinants of director compensation**

The table shows coefficient estimates from OLS regressions for the natural logarithm of the firm's average director compensation (in constant 2009 dollars). The sample comprises all firm years from ExecuComp in the 2005 to 2012 period. Log denotes the natural logarithm and *Employees* is the number of employees at the firm. The industry controls indicate the two-digit industry of the firm. Standard errors are in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5% and 10% level, respectively.

	(1)	(2)	(3)
Constant	2.847*** [0.133]	1.926*** [0.137]	4.305*** [0.118]
<i>Firm characteristics:</i>			
Log(Sales)	0.284*** [0.018]		
Log(Sales) <sup>2</sup>	-0.006*** [0.001]		
Log(Total assets)		0.509*** [0.019]	
Log(Total assets) <sup>2</sup>		-0.019*** [0.001]	
Log(Employees)			0.176*** [0.005]
Log(Employees) <sup>2</sup>			-0.004*** [0.001]
Industry controls	yes	yes	yes
Adjusted- <i>R</i> <sup>2</sup>	0.231	0.261	0.185
Number of observations	12,731	12,740	12,662