

## **Private Equity and the Resolution of Financial Distress\***

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## **Abstract**

In order to understand the role of private equity firms in the restructuring of financially distressed firms, we examine the private equity ownership of 2,156 firms which obtained leveraged loan financing between 1997 and 2010. The economic downturn beginning in 2007 is associated with a marked increase in defaults of these highly leveraged companies; approximately 50% of defaults involve PE-backed companies. However, PE-backed firms are no more likely to default during this period than other firms with similar leverage characteristics. But defaulting firms that are private equity backed spend less time in financial distress and are more likely to survive as an independent reorganized company versus being sold to a strategic buyer or liquidated. The ability to restructure more efficiently seems to be affected by the PE-sponsor's financial as well as reputational capital. In contrast, recovery rates to junior creditors are lower for PE-backed firms.

## I. Introduction

Leveraged buyouts (LBOs) by private equity funds have played a dominant role in corporate finance for more than two decades. Dating back to Jensen (1989), proponents have identified the benefits of LBOs including the discipline of high leverage, concentrated ownership structure, and monitoring by private equity (PE) sponsors.<sup>1</sup> Relatively less attention has been given to the potential downside of these transactions, namely that their high debt levels greatly increase the risk of financial distress. The most recent LBO boom, ending abruptly with the beginning of the financial crisis in 2007, has left a record number of PE-owned firms in default.

The main goal of the paper is to discern how private equity owners influence the outcome of distressed restructurings and the costs of financial distress. The impact of PE ownership on the likelihood or severity of distress is unclear. There are several reasons to expect a positive role for PE sponsors. The discipline of high leverage could lead to higher operating efficiency and lower the chance of financial distress. Further, if value declines, PE owners have strong incentives to correct this decline to preserve their equity stake, including by committing capital to support the distressed company. PE sponsors also have an incentive to preserve their reputation with lenders and future investors, even when they may lose an insolvent firm during restructuring. On the negative side, actions by aggressive private equity owners to boost their financial return, such as leveraging up a firm to pay large dividends, could drain needed liquidity from PE-owned firms and put these firms at a higher risk of default.<sup>2</sup>

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<sup>1</sup> For early empirical studies, see Kaplan (1989, 1991), Smith (1990), and Lichtenberger and Siegel (1987), which documented significant gains in profitability, productivity, and financial performance for firms after being acquired in LBOs. Guo et al (2011) and Lerner et al (forthcoming) provide more recent evidence on performance of buyouts. See also Cumming et al (2007) and Kaplan and Strömberg (2009) for recent reviews of the academic studies of the private equity market.

<sup>2</sup> See “Profits for Buyout Firms as Company Debt Soared,” *New York Times* (October 4, 2009). Moody’s Investor Service now explicitly ties its credit ratings of private equity-backed companies to a sponsor’s “track record” for engaging in leverage-increasing activities within its portfolio companies, including the issuance of dividends to itself shortly after the LBO, an aggressive acquisition strategy by the portfolio company, and a dependence on quick IPO

Our analysis of the role of PE sponsors in financially distressed firms proceeds in two steps. First, we examine whether PE-backed firms are more likely to become distressed than other firms with similar operational and financial characteristics. Second, we investigate how PE-backed companies that become distressed manage through the process of resolving distress.

To conduct our analysis, we follow a set of 2,156 “leveraged loan” borrowers over the period January 1997 through April 2010, tracking when PE sponsors enter and exit as owners of these firms, and recording when firms default. Borrowers in this market are highly levered, high credit risk firms, and typically pay large spreads on the loans they receive.<sup>3</sup> Virtually all LBO financing occurs through the leveraged market, and most PE-backed firms continue to rely on this market for follow-on debt financings. Non PE-backed firms that borrow in the leveraged loan market have credit profiles that are similar to highly leveraged PE-backed companies, making them ideal candidates for the control sample in our paper. Among the 2,156 firms in our sample, about half (1,062) are PE-backed at some point during the sample period.

We find that PE-backed firms have a higher observed default frequency than non PE-backed firms, 5.1% versus 3.4% on average over our sample period. However, once we control for differences in firm characteristics through a default prediction model similar to Shumway (2001), we find that these differences are driven by the higher leverage of the PE-backed firms. Controlling for the credit rating at the time of the last financing, PE-backing has no impact on the probability of default. Moreover, we find no evidence that recapitalizations used to pay dividends or develop acquisition programs affect default probabilities. Thus, on balance, PE-

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“flips” to exit the stock. See “Private Equity: Tracking the Sponsors,” *Special Comment, Moody’s Global Corporate Finance* (January 2008).

<sup>3</sup> The definition of what constitutes a “large” spread varies across sources, ranging from 150 basis points above LIBOR (pre-2002 definition provided by Standard & Poor’s) to 250 basis points above LIBOR (definition followed by Bloomberg). For more specifics on the leveraged loan market, see Yago and McCarthy (2004).

backed firms are no more (or less) likely to default than other firms with similar financial characteristics.

To assess the impact of PE owners on defaulted firms, we focus on four observable measures: the restructuring type (in versus out of court), restructuring outcome (ability to reorganize as an ongoing independent concern), time in restructuring, and recovery rates. Conditional on default, PE-backed firms are more likely to remain independent firms after default, rather than be sold to another company or liquidated piecemeal. Interestingly, this result is driven by PE-backed firms being more likely to survive when they are only financially rather than economically distressed. Moreover, PE-backed reorganizations are resolved more quickly than non PE-backed firms. The differences in time-to-resolution are both statistically and economically significant, with PE-backed firms completing reorganizations four months (27%) earlier than control firms, holding other risk characteristics constant. This result is partially explained by a higher frequency of pre-packaged bankruptcies among PE-backed firms. Within the PE-backed defaults, we also find evidence that firms backed by PE sponsors with more financial and reputational capital are more likely to restructure out of court, resolve their financial distress quicker, and are more likely remain independent after financial distress is resolved.

We also find that PE investors play an important role as acquirers of bankrupt assets. Even though only a small minority of pre-default owners retains control of companies, new PE investors often come in as acquirers of bankrupt firms. In total, about 20% of all bankruptcies end up with a PE fund as the controlling shareholder.

The bulk of the results post-default suggest the PE-sponsors help facilitate efficient restructurings and thus lower the cost of financial distress. Recovery rates provide a measure of

the success of a distress-related restructuring by estimating how much value creditors recover from the restructuring relative to the promised value of their claims. We find that recovery rates to creditors are in fact lower when the company is PE-backed. This is primarily driven by a lower recovery to bonds for the PE-backed defaults, while bank loan recovery rates are more similar across the PE- and non-PE-backed groups. These results mirror those of Kaplan and Stein (1993) who show that junk bond investors bear the majority of the credit losses after the late 1980's buyout boom.

In the light of the positive efficiency results on restructuring outcomes and time in default, we believe that there are two likely explanations for these lower recoveries. First, PE-backed firms enter default with higher debt levels (consistent with their lower asset to debt ratios in bankruptcy). Second, PE-backed firms could be more successful in restructuring their debt in default via concessions from bondholders.

Our paper provides new insights into an important aspect of private equity investments, as the increased number of defaulted LBOs has put PE firms in a central role in distressed markets. There has been surprisingly little emphasis in the academic literature on the potential downside of PE-backed LBOs, namely that high leverage increases greatly the potential for financial distress. The two notable exceptions are Kaplan and Stein (1993), who provide evidence that private equity markets use excessive amounts of leverage during boom times, and Andrade and Kaplan (1998) who show for an earlier sample of buyouts that the value gains from the buyout outweigh subsequent costs of financial distress. In contrast, our paper focuses on the growing role of the private equity industry in these restructurings. The costs of financial distress due to excessive leverage in PE-backed firms could offset the economic gains from active

ownership and governance. Our paper is also related to recent papers examining the role of activist investors in distressed restructurings (Li et al, 2011).

The rest of the paper is organized as follows. Section II discusses the methods and sources for creating the full sample of PE-backed and control firms, as well as the defaults-specific dataset of restructurings. Sections III and IV present our results. Section V summarizes our findings and describes future work related to PE actions in distressed companies.

## **II. Data**

### *II.a. Sample description*

Our sample is constructed to meet two objectives. First, we need to track a comprehensive and unbiased sample of PE-backed firms through time, observing whether they become financially distressed as well as the actions taken to restructure when distressed. Second, our analysis requires a set of “control” firms that are not controlled by a private equity fund. Collecting data on PE-backed firms is a challenge because private equity funds are not required to disclose financial information about the privately-owned firms in their portfolios.

To produce this sample, we start with lists from *Reuters LPC Dealscan* and *Dealogic* of firms borrowing in the leveraged loan market between January 1997 and April 2010. From this group, we keep only those firms that receive a non investment grade Moody’s issuer rating at some point during the sample period. This produces a sample of 2,156 firms, which we refer to hereafter as our “full sample”. Firms enter our panel when we first observe a leveraged financing in Dealscan or Dealogic, or a leveraged loan rating from Moodys.<sup>4</sup> Firms leave our panel when they default or are acquired; non-PE owned firms also leave the panel if they do not

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<sup>4</sup> We begin our sample period in 1997 when Moodys began to rate loans; see Sufi (2007) for a description of this process.

subsequently maintain a non-investment grade rating from Moodys. Firms are, on average, in our panel for 7 of the 14 years in our panel, yielding an unbalanced panel of 12,737 firm-year observations.

We restrict our analysis to rated leveraged loan issuers for several reasons. Even when these levered firms are private and not filing 10-K statements, Moody's still follows the firms and identifies defaults. There is also substantial information, particularly upon default, for firms in the leveraged loan market from Deal Pipeline, Debtwire, and other news sources. Further, we use the Moody's issuer ratings in our regressions to control for credit-related differences, even for the portion our sample where financial statements are unavailable. The Moody's rating also allows us to link these firms to Moody's *Ultimate Recovery Database*, which contains estimates of recovery rates on all outstanding debt for a subset of our defaulted firms.

We next identify when firms in our sample are PE-backed. Although *Dealscan* and *Dealogic* both indicate when a PE sponsor is involved in the financing of a company, these classifications only reference points in time at which firms issue new debt. Therefore we hand-collect the time series of ownership information using sources including *Capital IQ*, *Dealogic's Sponsor Analytics* database, *TheDeal Pipeline's* auction, M&A, and bankruptcy databases, SEC *Edgar* archives, and websites of PE funds and sample firms themselves. We record the dates at which a PE sponsor enters as a controlling owner of a sample firm, exit dates and types, and other information about PE actions for their portfolio firms.<sup>5</sup> To be classified as PE owned, ownership must be through a fund managed by a private equity firm. That is, the firm must buy and hold the company for purposes of control using equity capital raised in a limited liability fund, financed by outside investors. We exclude from this list hedge funds, investment management companies, financial institutions, nonfinancial corporations, and individual and

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<sup>5</sup> We also search for PE ownership in the 7 years prior to the January 1997 start of our panel.



family holdings *if* these institutions are not holding the ownership stake within a private equity fund structure.

To our full sample, we link information on past financings, financial characteristics, and credit ratings. We obtain information on loan financings during our sample period from *Dealscan* and *Dealogic* including the date and amount, and loan purpose. These sources also provide a measure of size – firm sales – at the time of each financing. Additional financial characteristics, including measures of size, leverage, and profitability firms are obtained as available from Compustat or from Moodys Financial Metrics database (for years 2004 through 2010). For a substantial portion of our sample not included on these databases, we hand collect financial data from 10-Ks. For the remaining firms not filing 10-Ks in a given year, we rely on industry-level medians for measures of profitability, using Fama-French industry groups calculated from COMPUSTAT data.

To identify defaults among PE-backed and control firms, we use Moody’s *Default Risk Service (DRS)* database. Moody’s *DRS* defines a default to be: (a) a missed interest or principal payment on a debt obligation, (b) a filing of a court-led bankruptcy, or (c) the execution of an out-of-court “distressed exchange.”<sup>6</sup> To the Moody’s recorded defaults, we add a small number of additional defaults identified from the sources described above.<sup>7</sup>

Table 1, panel A, provides descriptive statistics for our full sample of 2,156 firms, of which 991 (46%) are PE-backed at some point during the sample period. A total of 549 firms, or

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<sup>6</sup> A distressed exchange involves exchanging debt for another security of lower priority (such as equity), open market purchases of debt by the borrower at a substantial discount to the face value of the debt, or any other exchange that appears to allow the borrower to avoid default. See Moody’s Corporate Risk Default Service (2007).

<sup>7</sup> We identify less than 50 defaults not included in Moody’s database because the firm’s rating is withdrawn prior to default – this indicates it is unlikely we have failed to identify defaults within our sample, even when firms are private. We also examine listings of firms that have “distress warnings” from Deal Pipeline or are listed as “pre-restructuring” by Debtwire and find few firms we have not already identified as ultimately defaulting – this indicates that few firms become financially distressed but do not ultimately default. Our default prediction model results are unchanged when we include these additional distressed observations as defaults.

roughly a quarter of the sample, experience a default at some point between 1997 and 2010. The total number of default events is higher (632 defaults) because some firms experience more than one default in our time period. PE-backed firms account for 46% of the defaults, nearly the same as the proportion of PE-backed firms in the full sample. Hence, at this admittedly rough level, PE-backed firms seem no more or less likely to default when compared to non-PE-backed firms also borrowing in the leveraged loan market.

Table 1, panel B, shows default frequencies for the PE-backed subsample based on the year of the original buyout, indicating the percentage of firms that default within seven years of the buyout date. LBO default rates vary substantially depending on the year of the deal. Default rates are particularly low for LBOs undertaken in 2008 and 2009, presumably because these firms have not had enough time to experience a default. Excluding these two years, default rates vary from 12.3% for LBOs undertaken in 2001 to 31.6% for deals undertaken in 1997. Interestingly, despite the concern about the buyouts undertaken in the latest "LBO-boom", the default rates for these vintages are significantly lower than for those undertaken during the smaller boom of the late 1990's. Note that our hazard model for explaining defaults in Section II.b. allows for time varying covariates, such as the length of time since the previous leveraged financing.

### *II.b. Analysis of default probabilities*

Characteristics of our panel used to explain defaults are shown in Table 2. Panel A summarizes the default history of our non-PE (never PE owned), PE owned (PE owned in the current year), and PE exited (not currently PE owned, but former PE owner exited within the prior five years). Specifically, for each year of our sample, we observe whether a sample firm

defaults the following year. For example, 5.1% of non-PE-backed firms in our panel in 2007 default in the subsequent year.

One immediate observation is that over the entire sample period, PE-backed firms appear to default at a higher rate (5.1%) compared to non-PE backed firms (3.4%). The table also shows that in the years following the financial crisis, both types of firms experience an explosion in defaults, with default rates reaching 14.2% and 18.4% for the PE- and non-PE-backed subsamples, respectively. Over the period 2007-2010Q1, roughly 25% of all firms in our leveraged loan sample default on their debt; a default-rate unmatched by any other period during our sample. The table also shows that default rates are substantially lower among formerly PE-backed firms, with an average yearly default rate of 2.4%. This is not surprising, given that the PE-exited group consists largely of cases where the PE has exited through an IPO, and likely includes the firms that were most successful under PE ownership.<sup>8</sup>

Panel B of Table 2 compares other aspects of the financing history across our panel. One important variable is the amount of leverage that these firms take on, which is reflected in the firm's credit rating. We recode Moody's credit ratings to a numerical variable ranging from 1 ("Aaa") to 27 ("C"). The PE-owned firms are lower credit quality by about two rating notches; averaged over all years, the PE-owned firms have an average credit rating slightly above 20 (B2), and non-PE firms having an average rating slightly above 18 (B). We also see that credit quality trends down during our sample period, particularly for non-PE firms. Interestingly, the subsample of PE-exited firms also have lower credit quality, especially in the later years of our panel. This mirrors the findings in Cao and Lerner (2009) and Kaplan (1991) who show that

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<sup>8</sup> After one PE exits via a secondary buyout, the firm remains in our panel as a PE-backed firm. When a PE exits via a strategic acquisition or default, the firm leaves our panel in that year. Thus, the only remaining PE-exited firms in our panel are reverse LBOs.

reverse-LBOs have higher leverage than their peers. In subsequent regressions, we also examine leverage directly for the subsample of firms with data available from 10-Ks.

We also document when firms undertake any recapitalizations or acquisition financings, as indicated in Dealscan or Dealogic. We broadly define a recapitalization as any loan where the proceeds are used to refinance existing loans and/or to pay dividends to shareholders (our regressions also more narrowly consider only “dividend recaps”, which specify dividend payments as a use of proceeds). An acquisition financing is a loan where some portion of the proceeds finances an acquisition of another company. PE-funds have been criticized for an excessive use of various recapitalizations, especially dividend recaps, since these transactions are thought to contribute to future distress.<sup>9</sup> Indeed, we find that both types of financings are more frequent for PE-backed firms. These financings also peak during the boom years of the late 1990s and the years leading up to the financial crisis.

To test the impact of PE ownership on default probabilities, we estimate a discrete time hazard model using the methodology of Shumway (2001). This approach is similar to a panel logit model, and permits our covariates explaining default to be time varying. We use the dummy variable *PE-owned* to indicate firms owned by a PE fund in a given year. We also allow for historical PE-ownership to have an effect by including the second dummy variable, *PE-exited*, indicating observations where a PE-fund has exited within the last five years.

In default prediction models it is obviously important to control for firm financial performance. To include as many observations as possible, we use industry characteristics at the Fama-French 49-industry level as a substitute for individual firm performance. Specifically, we include the industry median sales growth and change in EBITDA/Sales as controls, calculated

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<sup>9</sup> See e.g. "Private equity ownership damages ratings," Reuters, March 1 2007, available at <http://www.reuters.com/article/2007/03/01/private-equity-ratings-idUSL0143972820070301>.

using COMPUSTAT firms in the same 4-digit SIC code and year. To control for differences in leverage, we use the credit rating of the firm at the time of the last reported leveraged loan financing, as discussed above. Finally, we also include dummy variables for whether the firm has undertaken a recapitalization or an acquisition financing within the last 5 years, as well as year fixed effects to control for changing macroeconomic conditions over time.

The hazard model estimates are shown in Table 3. The first two specifications indicate that PE-backed firms have a significantly higher default probability compared to non-PE-backed firms. Once we control for credit rating at the time of the last financing, these differences disappear. Thus, observed differences in default rates are driven by higher credit risk among the PE-backed companies. We also find that default probabilities decrease significantly after the PE fund has exited the investment. This is consistent with these firms being particularly well performing and thus being able to handle a higher debt level compared to other firms. Among the other control variables, decreasing industry profitability is a significant predictor of default, as would be expected. In contrast, we find no evidence that recapitalizations or acquisition financings affect the likelihood of default, even when we do not control for credit rating.

We are also interested in whether the characteristics of the PE fund affect the likelihood of default. In particular, PE investors with more cash available in their fund may have a larger ability to avoid financial distress by infusing new equity in the company. Also, PE funds with more reputational capital, e.g. older or larger funds, may have a different incentive to avoid financial distress in their portfolio companies. Demiroglu and James (2008) and Ivashina and Kovner (2008) find that more reputable PE firms receive better loan terms in the LBOs that they sponsor. Presumably, this should reflect lenders' expectations of lower default costs with more reputable sponsors. We therefore estimate the hazard model for the subsample of PE-backed

firms, and include the size of the PE fund as a control variables (regressions using PE age produce similar results). The last two columns of Table 3 shows the results for the subset of firms with PE characteristics data available from Prequin; we do not find any PE characteristics to be statistically significant for predicting default.

To summarize, we find a somewhat higher incidence of default among PE-backed companies. This is driven by the lower credit rating (reflecting higher leverage) of the LBO financings compared to the non-PE firms. Controlling for the difference in credit quality, however, PE-backed firms are no more likely to default. Whether this suggests that PEs contribute to defaults is open to interpretation. Holding leverage constant, the presence of a PE does not contribute to defaults. On the other hand, PE transactions are associated with higher leverage, increasing the likelihood of default. Finally, although recapitalizations are indeed more common for PE-backed firms, they seem to have no impact on default probabilities.

### ***III. Resolution of financial distress***

#### **III.a. Default sample description**

For firms that experience default at some time during our sample period, we code additional information on how the firm restructures to resolve its financial distress. Moody's DRS dataset contains rudimentary information about the restructuring which may include the initial default date, whether the firm resolved its distress out of court or through a bankruptcy filing, the bankruptcy filing date in cases that a court filing occurs, whether the bankruptcy filing was "prepackaged", a rough indication of whether a bankrupt firm exits as a reorganized independent company, is acquired by another company, or is liquidated, and the resolution date of the restructuring.

We build extensively on the Moody's *DRS* information using the additional sources noted above. For each defaulted firm, we record the type of restructuring (distressed exchange, other out of court restructuring, prepackaged or prearranged Chapter 11 filing, or other Chapter 11 filing<sup>10</sup>). We also record the outcome of the restructuring (reorganize as an independent company, change of control to a financial buyer, sale to a strategic buyer, or piecemeal controls the firm upon the resolution of distress, including whether it is the owner prior to the default.<sup>11</sup>

Table 4 compares PE- and non-PE defaults across a number of pre-default characteristics. In this and subsequent tables, variables are measured relative to the date of default (so year -1 is the fiscal year end preceding the default). We are able to find at least partial financial information for 431 of our 577 defaults using the combination of COMPUSTAT, Moodys, and 10-K filings from Edgar. Interestingly, as many as 48% of PE-backed defaults are listed on COMPUSTAT in the two years prior to default, which likely indicates these firms have more dispersed ownership of publicly registered securities. The median default occurs 21 months since the last leveraged loan financing, and median PE-backed firm defaults two months later than the non-PE firms, a relatively small but statistically significant difference.

Interestingly, PE-backed firms are significantly more likely to file for bankruptcy in Delaware (61% of filings) compared to non-PE (36% of filings). Legal scholars have argued that the choice to file in Delaware is strategic. Ayotte and Skeel (2004) argue that this is because the Delaware bankruptcy court is more efficient; others such as LoPucki and Kalin (2001) and

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<sup>10</sup> Prepackaged bankruptcies differ from prearranged bankruptcies by already having the "Plan of Reorganization" approved by most of the creditors in the case. This means the judge can move quickly through documents and motions to confirm the bankruptcy restructuring in a short period of time. See, for example, "Prenegotiated and Prepackaged Plans of Reorganization", *Kirkland & Ellis LLP Overview of Client Representation Experience*, available at <http://www.kirkland.com/sitecontent.cfm?contentID=218&section=5&subitemid=586&itemid=767>.

<sup>11</sup> We group PE-exited firms, where the PE exits before the onset of default, as non-PE-backed for this part of our analysis. There are only 15 defaults of former PE-backed companies, which exit between 63 and 8 months before the default (and only two exits within a year of the default). Reclassifying these as PE-backed would not affect our results in any material way.

LoPucki and Doherty (2002) argue that the choice of venue reflects Delaware's preferential treatment of owners, which they describe as result of a "race to the bottom".

A notable difference between the PE and non-PE subsamples is the size of the company. Using information from the last available financial statement within two years of default (for the subsample where we have financial information), PE-backed companies have average (median) sales of \$1.1 billion (\$487 million) compared to \$3.1 billion (\$830 million) for non-PE-backed firms.

We then consider whether PE and non-PE defaults differ in terms of their economic viability. While we are restricted by the limited financial information for private firms, we can get a sense of economic performance by examining characteristics of firms in the same in the same Fama-French 49 industry (similar to Axelson et al, 2009) in the default year. For two measures of operating performance, industry sales growth and the industry change in operating margin (operating income divided by sales) over the prior year, we find no significant differences between PE-backed and non-PE-backed companies at default. For the subsample with financial data available we find that PE-backed defaults have somewhat higher EBITDA/Sales ratios, and a higher fraction of PE-backed companies have positive EBITDA in the last financial statement before default (84% vs. 79%), although none of these differences are statistically significant.

We also collect data on the debt structure of the defaulted firms before and at default. Previous literature (e.g. Gilson et al (1990); Asquith et al (1989)) argues that complex debt structures and holdout problems on dispersely held debt can hamper the ability of defaulted firms to restructure. To measure complexity we use a dummy for whether the defaulted firms have



bonds outstanding (based on Moody's DRS and URD databases). The PE-backed firms have a somewhat lower frequency of having bonds outstanding (31% vs. 36%).

Table 4 also shows the frequency of recapitalizations in the 3-year period preceding default, many of which specify that the proceeds are used to pay out a dividend or buy back shares.<sup>12</sup> Similar to in the full sample, such recapitalizations are indeed more common preceding PE-backed defaults, although the overall frequency is quite low: 5.1% of our PE-backed defaults had a dividend recapitalization within 3 years of default, compared to 1.2% for the non-PE-backed defaults.

To summarize, we find a number of differences between the PE and non-PE backed firms, which necessitates controlling for these characteristics in our analysis of default outcomes.

### *III.b. Default outcomes*

As noted above, we measure the outcomes of the default in four ways: the restructuring type (in versus out of court), restructuring outcome (ability to reorganize independently), time in restructuring, and recovery rates. Descriptive information for these outcomes is provided in Table 5.

#### *III.b.1. Restructuring types*

Panel A shows the restructuring types for the sample of 577 default events, of which 235 involve PE-backed firms.<sup>13</sup> 74% of default observations are Chapter 11 bankruptcies and 26% are out-of-court restructurings. Among the bankruptcies, we distinguish between pre-packaged bankruptcies (19% of defaults) and other Chapter 11 filings (55% of defaults). Out-of-court restructurings that are unsuccessful and subsequently file for Chapter 11 are characterized as

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<sup>12</sup> Some financings may be used to pay dividends even when not explicitly stated as a use of proceeds; thus our frequency of dividend recaps is likely a lower bound on the extent of this activity. The frequency of all recapitalizations is likely an upper bound for this activity.

<sup>13</sup> In this draft we include only the 577 default events identified from Moody's DRS database.

bankruptcies. Among the out-of-court restructurings, distressed exchanges are the most common (17% of defaults), while other out-of-court workouts are relatively rare (8% of defaults). Strikingly, pre-packs account for 28% of defaults for the PE subsample compared to 14% of defaults for the non-PE subsample. In other words, PE-backed firms are more likely to negotiate a preliminary reorganization plan with their creditors before filing for bankruptcy compared to other firms. Pre-packaged bankruptcies have been shown to be a way to speed up the bankruptcy process by reducing the risk of creditors holding up the reorganization plan, and can also be beneficial for tax purposes (see e.g. McConnell and Servaes (1991)). Also, pre-packaged bankruptcies have been shown to be more common in Delaware, consistent with the fact that PE-backed firms are more likely to file in Delaware (see e.g. LoPucki and Doherty (2002)).

In addition, PE-backed firms are somewhat more likely to restructure out of court (28% vs. 24% of defaults). To the extent that distress costs are lower for firms that achieve out of court restructurings, this suggests more efficient restructurings for the PE-backed firms.

### *III.b.2. Restructuring outcomes*

Table 5, Panel B, shows descriptive statistics on the ultimate outcome of the distressed restructuring. In 64% of all defaults, the company successfully reorganizes as an independent going concern through a bankruptcy or out-of-court restructuring; in 6% of the cases the company is sold as a going concern to a financial buyer and continues to operate as an independent company; in 9% of the cases the company ends up being sold to a strategic acquirer, ceasing to operate as an independent company; and in 14% of cases the firm is liquidated. For the remaining 7% of the defaults (42 observations), the case is still ongoing as of June 2010. Comparing the various outcomes across PE status, the most notable difference is that 11% of PE-backed firms are liquidated, while 16% of non-PE cases end in liquidation.

Table 5, Panel C, addresses a related aspect of PE involvement in default, namely as acquirers of bankrupt firms. For firms that emerge from Chapter 11, either by reorganizing independently or being acquired by a financial buyer, we examine the identity of a controlling owner at emergence, if any. Most often, equity in the restructured firm ends up in the hands of pre-bankruptcy creditors – either banks (20% of cases), hedge funds (10% of cases), or other creditors of unknown identity (36% of cases). Pre-bankruptcy equity holders retain control in a minority of cases; these include the pre-bankruptcy PE owner (5% of cases), pre-petition shareholders (1% of cases), or management (2% of cases). Interestingly, though, this shows that pre-petition owners are much more likely to remain in control after Chapter 11 when they are a PE-fund. It is worth pointing out that it is extremely unlikely that a pre-petition equity-holder keeps control without infusing new equity into the company, and these results show that PE-owners are significantly more likely to do this. The more important role played by PE investors, however, is as new owners coming in to acquire firms in bankruptcy. In 26% of all bankruptcy reorganizations, PE funds end up controlling the firm after bankruptcy, though these PE investors are usually different from the pre-bankruptcy owner.<sup>14</sup> Hence, while there is a greater likelihood of PE-backed firms ending up in distress, other PE investors often play a significant role in restructuring the bankrupt firms.

### *III.b.3. Time in restructuring*

The time a company spends in default provides another measure of the efficiency of the distress resolution process. Given the costs of remaining in financial distress – both direct costs such as fees and restructuring expenses, and indirect costs related to the company’s operations – quicker resolution should be associated with higher efficiency. Table 5 Panel D shows that the

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<sup>14</sup> Note that in their role as distressed debt investors, PE firms do not fund these investments using the same financing structure we use to define PE-backed firms elsewhere in this paper.

median restructuring time for all default events is 11 months (12 months conditional on filing for bankruptcy). These measures are censored, however, since many recent defaults are not yet resolved. Excluding the post-2006 defaults, the median firm spends 13 months in default (14 months conditional on bankruptcy). Comparing PE- versus non-PE-backed defaults, PE-backed firms are significantly quicker resolving their distress, and have average (median) default times that are 4.9 months (3 months) shorter than other defaults. This is robust to the censoring problem, since PE-backed firms have shorter default times for all sub-periods in the sample.

#### *III.b.4. Recovery rates*

To consider the efficiency of distress resolution at the overall firm level, it is also important to consider the restructuring outcome from the perspective of the firm's creditors. In order to do this we use Moody's data on creditor recoveries. Moody's provides recovery rates for all outstanding debt classes for a subsample of their reported defaults, regardless of whether these claims are rated or publicly traded. The data also allows us to observe recoveries separately on the firm's bank loans and bonds.

Panel E of Table 5 shows univariate statistics on Moody's discounted recovery rates for bank loans and bonds, both for the overall firm and for bonds and bank loans individually.<sup>15</sup> For the full sample, overall average recovery rates are 53%. As we would expect based on their seniority, recoveries are higher for bank loans than for bonds (85% versus 34%). Recoveries are the highest when the firm is reorganized as an independent company (57%) and lowest when the firm is liquidated (33%). Unlike the positive effect of PEs on the restructuring outcome or time in default, PE-backed defaults are associated with a 6% lower recovery rates to creditors overall.

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<sup>15</sup> See Zhang (2009) for a description of the firm wide recovery rates. While the recoveries do not consider distributions to equity, recoveries to equity in the vast majority of bankruptcies are close to zero.

This is particularly pronounced for bond recoveries, with 13% lower recovery rates for PE-backed versus non-PE-backed defaults.

## **V. Multivariate analysis of default outcomes**

Although the univariate differences between PE- and non-PE-backed defaults are informative, they do not control for other differences in firm characteristics, many of which were shown to be significant in Table 4.

In Table 6, we test whether defaulting PE-backed firms are more likely to file for bankruptcy than restructure out of court, using probit regressions that control for various pre-default characteristics. In regressions (1) and (2) the coefficient for PE-backing is insignificant, similar to what was found in the univariate analysis. The one significant factor affecting the probability of bankruptcy is whether the firms have bonds outstanding, which suggests that it is more difficult for firms with complex debt to restructure out of court.

Even though PE-backing does not seem to be important in itself, however, the ability to restructure out of court may differ across PE investors. To examine this, regressions (3) and (4) restrict the analysis to the PE-backed subsample, which allows us to include PE fund characteristics in the regression. We find that firms backed by larger PE-funds (relative to the size of the firm's debt) and funds that were raised more recently (indicating that they are more likely to have undrawn capital left in the fund) are significantly less likely to file for bankruptcy. This gives support to the hypothesis that the ability of PE-funds to infuse more capital into a distressed firm helps these firms avoid bankruptcy.

From the univariate analysis we saw that the largest difference between PE- and non-PE-backed firms was whether they negotiated the terms of the bankruptcy before filing. Regressions

(5) and (6) include only bankruptcy events, and estimate the probability of a non-prepackaged bankruptcy. These results confirm that pre-packed bankruptcies are significantly more likely for PE-backed firms. In unreported regressions we show that this result still holds when we control for whether the firm files in Delaware or not.

Table 7 uses probit regressions to explain the restructuring outcome, controlling for various firm and industry characteristics. Since liquidations and strategic sales are often hard to distinguish economically, we focus on whether the company remains independent after default, i.e. whether the company reorganizes successfully or is sold to a financial buyer. For the full sample of defaults, the likelihood of remaining an independent company is significantly higher for PE-backed firms. Distinguishing the effect of PE-backing on profitable versus unprofitable firms (regression (3)) provides a clearer picture. In particular, for profitable firms (with  $EBITDA > 0$ ), the presence of a PE investor significantly increases the likelihood of the firm remaining independent, while for unprofitable firms the PE-backing has a negative and insignificant effect. Hence, the results suggest that PE-backed firms have a greater likelihood of successfully restructuring as an independent company when their underlying operations are economically healthy. In other words, the bankruptcy screening mechanism seems to work efficiently when PE-investors are present, with profitable firms being saved and unprofitable firms being acquired or liquidated.

Restricting the analysis to the subsample of PE-backed firms again allows us to consider differences in PE characteristics. We find that older PE sponsors, presumably with higher reputation capital, are associated with a higher likelihood of survival. In contrast, when the firm is backed by a *fund* that was raised longer ago, which indicates that the sponsor is restricted in the amount of capital left in the fund to support the company, the likelihood of survival is lower.

Hence, when the PE sponsor has more reputational and financial capital, the default outcome is more likely to result in the firm remaining independent rather than being sold or liquidated.

The efficiency of the restructuring is also reflected in the time needed to resolve default. Table 8 reports OLS regressions where the dependent variable is the number of months in default, and largely confirms the differences between PE and non-PE firms shown in the univariate analysis. The PE-owned dummy is largely statistically significant across specifications with a coefficient ranging from -2 to -4.5 months. Similar to the earlier results, the increased efficiency is particularly pronounced among firms that are profitable going into default (regression (4)). Other factors affecting the time in default are the size of the firm, which increases default time, and whether the firm has bonds outstanding, which surprisingly decreases default time. This latter result does not seem to be driven by distressed exchanges, since it holds for the bankruptcy subsample as well (regression (3)), and suggests that while complexity makes out of court restructuring more difficult it does not slow the overall resolution process.

In unreported results, we also include a dummy for whether the firm files for a prepackaged bankruptcy in the regression. Although prepackaged bankruptcies are significantly quicker than other bankruptcies, the negative coefficient on PE-backing is still significant, suggesting that this result is not simply driven by the higher incidence of pre-packs for PE-backed firms. Together with our earlier results on restructuring outcome, the default time results suggest that PE investors facilitate the resolution of financial distress.

The last two regressions ((5) and (6)) consider whether PE fund financial and reputational capital improve the speed of default resolution. We find some indication that PE fund size (relative to the amount of debt) is negatively related to the time in default, although the coefficient is not statistically significant in all specifications.

Our final set of regressions considers the relationship between PE ownership and recovery rates. The univariate analysis suggests lower recovery rates for PE-backed firms, which is not (necessarily) consistent with more efficient default resolution. Table 9 shows that these results carry through in the multivariate analysis as well. PE-backed firms have bond recovery rates that are up to 17% lower than non-PE-backed firms, while the differences for bank recovery rates are smaller and not always statistically significant. Somewhat surprisingly, the negative effect of PE-backing on recoveries is larger for firms with positive EBITDA (regressions (3) and (7)). One potential explanation could be that PE-backed firms enter default with larger debt levels (consistent with their lower asset to debt ratios in bankruptcy). Still, when we control for leverage using the Debt to Sales ratio at the last financing, the negative effect of PE-backing is still present, and leverage is insignificant.

Hence, the reason for the lower recovery rates for PE-backed firms remains somewhat of a puzzle. It does not seem to be driven by PE-backed firms being in worse economic shape, nor by differences in indebtedness across the subsamples. One remaining possibility is that PE-backed firms are more successful in gaining concessions from creditors, and in particular from bondholders. One reason for such concessions could be that these defaults may be more likely to have the new owners, who may or may not be the old PE fund, contribute new equity into the firm in the restructuring. We are currently in the process of collecting data that will hopefully shed more light on the dynamics behind these recovery rates.

## **V. Conclusions**

Our results can be summarized as follows. First, we show that PE-owned firms default with greater frequency than non PE-backed firms, but that this difference is driven by the PE-



owned firms having a lower credit rating at the time of the buyout financing. Controlling for the differences in debt rating at the time of the granting of the loan, there is no difference in default probability for PE-backed firms compared to other firms. Second, conditional on default, PE-owned firms are more likely to remain independent firms after default, rather than be sold to another company or liquidated piecemeal. This result is driven by PE-owned firms being more likely to survive when they are only financially rather than economically distressed. Moreover, PE-owned firms reorganize more, and bankruptcies are more likely to be prenegotiated. These results suggest that PE-backing improves the screening process in bankruptcy, increasing the likelihood that economically viable firms are successfully reorganized. The willingness of PE-sponsors to facilitate the restructuring seems to be affected by their reputation as well as the amount of equity capital available to support the distressed firm. We also find that PE investors play an important role as acquirers of bankrupt assets.

These results point in the direction of PE-funds facilitating the restructuring process, making the outcome of default more efficient. In contrast, recovery rates to creditors are lower when the company is PE-owned. This is driven by a lower recovery to bonds for the PE-backed defaults, while bank loan recovery rates are more similar across the PE- and non-PE-backed groups. These results are consistent with the findings of Kaplan and Stein (1993) who show that junk bond investors bore the majority of the credit losses after the late 1980's buyout boom.

Subsequent versions of this paper will deepen our analysis along several dimensions. In particular, we are in the process of collecting more data on pre-default capital structures and on equity infusions into the companies. In light of the positive efficiency results on restructuring outcome and time in default, we believe that the likely explanation for lower recovery rates is that PE-owned firms are more successful in restructuring their debt and gaining concessions

from bondholders, perhaps by owners contributing more new equity into the firm in the restructuring. Our additional data will enable us to address this explanation.

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**Table 1: Descriptive statistics for leveraged loan sample**

Panel A considers the full sample of 2,156 firms with leveraged loan financing. Firms enter the sample if a leveraged loan is observed in Dealscan, Dealogic, or the firm has a non-investment grade loan rating in Moody's DRS database. Credit rating is coded as a numerical variable between 1 (AAA-rating) and 27 (C-rating), with: "Aaa" 1, "Aa" 2, "Aa1" 3, "Aa2" 4, "Aa3" 5, "A" 6, "A1" 7, "A2" 8, "A3" 9, "Baa" 10, "Baa1" 11, "Baa2" 12, "Baa3" 13, "Ba" 14, "Ba1" 15, "Ba2" 16, "Ba3" 17, "B" 18, "B1" 19, "B2" 20, "B3" 21, "Caa" 22, "Caa1" 23, "Caa2" 24, "Caa3" 25, "Ca" 26, and "C" 27. Panel B considers the subsample of leveraged loan borrowers consists of firms that are PE owned at any time between 1997 and 2009. We classify firms as PE owned when a PE firm buys and controls the company using equity capital raised in a limited liability fund, financed by outside investors. Ownership and default information is determined from Capital IQ, Dealogic's Sponsor Analytics database, Deal Pipeline, SEC Edgar, and other news sources.

*Panel A: Leverage Loan Panel*

	#	%
Firms in leveraged loan sample	2,156	100.0%
Firms ever Private Equity (PE) owned	991	46.0%
Firms default between 1997 and 2010	549	25.5%
	Mean	Median
Credit rating at financing	19.5	20
Number of years firm is in panel	7.1	7
Total number of defaults	632	100.0%
PE owned within 7 yrs prior to default	292	46.2%

*Panel B: PE owned subsample*

<u>Year of PE entry</u>	<u># of PE entries</u>	<u># that default within 7 yrs of entry</u>	<u>% defaults</u>
1996 or earlier*	171	27	15.8%
1997	76	24	31.6%
1998	105	25	23.8%
1999	100	22	22.0%
2000	76	10	13.2%
2001	57	7	12.3%
2002	66	11	16.7%
2003	107	18	16.8%
2004	124	27	21.8%
2005	111	17	15.3%
2006	133	26	19.5%
2007	114	15	13.2%
2008	35	3	8.6%
2009	24	0	0.0%
Total	1,299	232	17.9%

\*includes firms that are PE owned at the start of our panel in 1997

**Table 2: Default frequencies and other characteristics by year**

Sample consists of 2,160 firms with leveraged loan financing. Firms enter the sample if a leveraged loan is observed in Dealscan, Dealogic, or the firm has a non-investment grade loan rating in Moody's DRS database. Firms exit the sample in the year following default, acquisition, or in the case of non-PE backed firms if they no longer have a non-investment grade rating from Moodys. *PE exited* firms were PE owned within the prior 5 years. Defaults include out of court reorganizations and bankruptcy filings identified by Moodys or reported in news services. Credit rating is coded as a numerical variable between 1 (AAA-rating) and 27 (C-rating), with: "Aaa" 1, "Aa" 2, "Aa1" 3, "Aa2" 4, "Aa3" 5, "A" 6, "A1" 7, "A2" 8, "A3" 9, "Baa" 10, "Baa1" 11, "Baa2" 12, "Baa3" 13, "Ba" 14, "Ba1" 15, "Ba2" 16, "Ba3" 17, "B" 18, "B1" 19, "B2" 20, "B3" 21, "Caa" 22, "Caa1" 23, "Caa2" 24, "Caa3" 25, "Ca" 26, and "C" 27.

*Panel A: Defaults by year*

Default year	Non- PE		PE-owned		PE exited		Total % that default
	# firms in sample	% that default	# firms in sample	% that default	# firms in sample	% that default	
1997	746	1.1%	183	1.1%	50	2.0%	1.1%
1998	873	2.5%	259	4.6%	58	6.9%	3.2%
1999	850	4.2%	316	6.3%	59	0.0%	4.6%
2000	815	5.2%	333	9.3%	60	3.3%	6.2%
2001	775	4.4%	320	6.6%	69	0.0%	4.7%
2002	739	2.7%	330	4.2%	66	4.5%	3.3%
2003	674	1.8%	362	3.3%	81	1.2%	2.2%
2004	620	1.6%	403	2.0%	113	0.9%	1.7%
2005	570	1.1%	418	2.4%	153	0.0%	1.4%
2006	491	0.4%	440	0.9%	184	0.0%	0.5%
2007	391	5.1%	454	7.3%	213	2.3%	5.5%
2008	294	18.4%	416	14.2%	180	7.8%	14.3%
2009	87	2.3%	341	2.6%	143	2.8%	2.6%
All years	7,925	3.4%	4,575	5.1%	1,429	2.4%	3.9%

Panel B: Other characteristics by year

Default year	Non PE			PE owned			PE exited		
	Mean rating at last financing	% with recap in last 5 yrs	% with acquisition financing in last 5 yrs	Mean rating at last financing	% with recap in last 5 yrs	% with acquisition financing in last 5 yrs	Mean rating at last financing	% with recap in last 5 yrs	% with acquisition financing in last 5 yrs
1997	17.4	13.0%	39.9%	19.6	15.8%	37.3%	19.3	30.0%	40.0%
1998	17.5	10.5%	43.8%	20.0	15.4%	45.3%	18.5	27.6%	63.8%
1999	17.6	9.3%	44.9%	20.0	15.8%	47.0%	18.8	16.9%	66.1%
2000	17.6	8.2%	46.1%	20.0	14.0%	50.6%	19.0	11.7%	65.0%
2001	17.7	6.8%	45.0%	20.0	12.4%	42.8%	19.1	10.1%	58.0%
2002	18.0	5.3%	42.1%	20.2	8.6%	43.1%	19.8	10.6%	51.5%
2003	18.2	4.3%	37.4%	20.3	8.6%	32.7%	19.8	7.4%	48.1%
2004	18.4	4.2%	34.8%	20.5	13.7%	37.1%	20.1	16.8%	46.0%
2005	18.5	5.4%	36.0%	20.8	22.4%	43.2%	20.4	20.3%	49.7%
2006	18.6	8.8%	39.7%	20.7	22.8%	55.2%	20.6	27.2%	57.6%
2007	19.0	11.0%	43.5%	20.7	23.2%	64.3%	20.7	34.7%	62.0%
2008	19.5	9.5%	43.5%	20.7	22.8%	62.7%	20.5	34.4%	65.6%
2009	19.1	9.2%	43.7%	20.5	19.8%	56.1%	20.6	27.3%	55.9%



**Table 3: Determinants of defaults for the leveraged loan sample**

This table shows the results from the estimation of a discrete time hazard model for the probability of default, controlling for firm rating, industry performance, and characteristics. Standard errors are adjusted as in Shumway (2001). Panel is based on 2,156 firms with leveraged loan financing, followed from 1997 to 2010. Firms enter the panel if a leveraged loan is observed in Dealscan, Dealogic, or the firm has a non-investment grade loan rating in Moody's DRS database. Credit rating is coded as a numerical variable between 1 (AAA-rating) and 27 (C-rating). The median rating of 20 corresponds to "B2". Chi-square statistics are reported in parentheses and are statistically significant at the 1% (\*\*\*) , 5% (\*\*), and 10% (\*) levels.

	All firms			PE owned or exited only	
	(1)	(2)	(3)	(4)	(5)
Intercept	-1.78 *** (24.80)	-3.34 *** (209.57)	-9.82 *** (65.26)	-9.95 *** (15.54)	-10.04 *** (16.08)
PE owned	0.43 ** (3.24)	0.44 ** (3.66)	0.12 (0.20)		
PE exited	-0.90 ** (3.52)	-0.84 ** (3.15)	-1.08 ** (4.43)	-1.18 * (2.41)	-1.16 * (2.30)
Median industry change in sales	-2.75 (1.72)	-0.71 (0.16)	-0.90 (0.20)	-1.21 (0.08)	-0.91 (0.04)
Median industry change in EBITDA/sales	-10.59 (1.40)	-18.12 ** (5.00)	-19.52 ** (3.82)	-10.03 (0.19)	-10.44 (0.21)
Recap in past 5 years	0.01 (0.00)	0.09 (0.07)	0.01 (0.00)	-0.16 (0.07)	-1.23 (0.94)
Acquisition financing in last 5 years	-0.01 (0.00)	0.04 (0.03)	-0.03 (0.02)	-0.14 (0.09)	-0.16 (0.12)
S&P 500 return		-2.29 *** (19.55)	-2.06 *** (13.37)	-2.07 (1.47)	-2.00 (1.42)
Rating at last financing			0.35 *** (36.55)	0.36 *** (9.78)	0.37 *** (10.17)
PE size				0.00 (0.01)	0.00 (0.01)
Year dummies	Yes	Yes	Yes	Yes	Yes
N	12,737	12,737	7,885	2,635	2,635

**Table 4: Defaulted firm characteristics**

Descriptive statistics for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 235 companies that were owned by private equity funds at the time of default (PE-backed) and 342 companies that were not (non-PE-backed). Differences between the PE- and non-PE-backed subsamples are statistically significant using a rank-sum test at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.

		Non PE-backed	PE-backed	Total	
Firm is on Compustat	N	342	235	577	
	Mean	0.693	0.477	0.605	***
	Median	1	0	1	
No. months since last leveraged loan financing	N	311	212	523	
	Mean	24.669	25.976	25.199	**
	Median	20	22	21	
Delaware bankruptcy	N	191	143	334	
	Mean	0.356	0.615	0.467	***
	Median	0	1	0	
Sales, last financial statement	N	268	163	431	
	Mean	3072.37	1101.865	2327.144	***
	Median	830.006	487.64	735.236	
Industry sales growth, year of default	N	341	235	576	
	Mean	0.058	0.05	0.054	
	Median	0.058	0.055	0.058	
Industry operating margin change, year of default	N	341	235	576	
	Mean	-0.002	-0.005	-0.004	
	Median	-0.002	-0.003	-0.003	
EBITDA/Sales, last financial statement	N	268	163	431	
	Mean	0.061	0.081	0.069	
	Median	0.06	0.08	0.066	
Sales growth, last financial statement	N	255	147	402	
	Mean	0.128	0.129	0.129	
	Median	0	0.003	0.001	
EBITDA>0, last financial statement	N	269	163	432	
	Mean	0.788	0.84	0.808	
	Median	1	1	1	
Bonds outstanding	N	342	235	577	
	Mean	0.365	0.311	0.343	
	Median	0	0	0	
Total debt at bankruptcy filing	N	171	110	281	
	Mean	3627.039	1002.771	2599.745	***
	Median	708.4	481.93	592.816	
Assets/Debt at bankruptcy filing	N	171	110	281	
	Mean	1.102	0.762	0.969	***
	Median	1	0.782	0.951	
D/EBITDA>9, last financial statement	N	268	163	431	
	Mean	0.5	0.509	0.503	
	Median	0.5	1	1	
Dividend recap within 3 years of default	N	342	235	577	
	Mean	0.012	0.051	0.028	***
	Median	0	0	0	
Any recapitalization within 3 years of default	N	342	235	577	
	Mean	0.032	0.098	0.059	***
	Median	0	0	0	

**Table 5: Restructuring types, outcomes, and recovery rates**

Default types and outcomes for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 235 companies that were owned by private equity funds at the time of default (PE-backed) and 342 companies that were not (non-PE-backed). The recovery rates are discounted creditor recovery rates according to Moody's for a sample of 204 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 75 companies that were owned by private equity funds (PE-backed) at the time of default and 129 companies that were not (non-PE-backed). Differences between the PE- and non-PE-backed subsamples are statistically significant using a rank-sum test at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.

*Panel A: Restructuring type*

		Chapter 11 (excluding pre-packed)	Pre-packed bankruptcy	Distressed exchange	Other out-of- court	Total
Whole sample	N	316	112	100	49	577
	% of defaults	55%	19%	17%	8%	
PE-backed	N	105	65	44	21	235
	% of defaults	45%	28%	19%	9%	
Non-PE-backed	N	211	47	56	28	342
	% of defaults	62%	14%	16%	8%	

*Panel B: Restructuring outcome*

		Acquired by financial buyer	Acquired by strategic buyer	Independent company	Liquidated	Ongoing
Whole sample	N	32	52	370	81	42
	% of defaults	6%	9%	64%	14%	7%
PE-backed	N	17	21	157	26	14
	% of defaults	7%	9%	67%	11%	6%
Non-PE-backed	N	15	31	213	55	28
	% of defaults	4%	9%	62%	16%	8%

*Panel C: Post-bankruptcy ownership in cases company remains independent or is acquired by a financial buyer*

		Creditors of unknown identity	Bank lenders	Hedge fund	New PE investor	Old PE investor	Management	Old non-PE shareholders	Total
Whole sample	N	77	43	21	57	10	5	3	216
	% of bankruptcies	36%	20%	10%	26%	5%	2%	1%	100%
PE-backed	N	30	20	12	28	9	1	0	100
	% of bankruptcies	30%	20%	12%	28%	9%	1%	0%	100%
Non-PE-backed	N	47	23	9	30	0	4	3	116
	% of bankruptcies	41%	20%	8%	25%	0%	3%	3%	100%

*Panel D: Number of months in default*

	Time period	Mean	Median	N
Whole sample	1997-2006	15.6	13	331
	2007-2008	9.1	9	56
	2009-2010	5.5	6	66
	1997-2010	13.3	11	453
PE-backed	1997-2006	12.6	11	123
	2007-2008	7.6	6	29
	2009-2010	4.6	5	33
	1997-2010	10.4	8	185
Non-PE-backed	1997-2006	17.3	14	208
	2007-2008	10.7	11	27
	2009-2010	6.5	6	33
	1997-2010	15.3	12	268

Panel E: Creditor recovery rates

	<u>Overall</u>			<u>Bonds</u>			<u>Bank debt</u>		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
<u>Whole sample</u>									
Acquired by financial buyer	10	0.44	0.49	9	0.11	0.13	10	0.68	0.78
Acquired by strategic buyer	26	0.47	0.54	25	0.23	0.15	24	0.83	1
Independent company	146	0.57	0.58	143	0.4	0.32	141	0.89	1
Liquidated	22	0.33	0.3	21	0.1	0.05	19	0.69	0.81
Total	204	0.53	0.53	198	0.34	0.24	194	0.85	1
<u>PE-backed</u>									
Acquired by financial buyer	5	0.35	0.45	5	0.08	0.02	5	0.64	0.89
Acquired by strategic buyer	7	0.52	0.57	7	0.28	0.09	7	0.91	1
Independent company	55	0.52	0.49	53	0.3	0.25	54	0.86	1
Liquidated	8	0.31	0.25	8	0.03	0.01	8	0.48	0.38
Total	75	0.49	0.47	73	0.25	0.2	74	0.81	1
<u>Non-PE-backed</u>									
Acquired by financial buyer	5	0.54	0.56	4	0.16	0.19	5	0.71	0.78
Acquired by strategic buyer	19	0.46	0.52	18	0.21	0.16	17	0.79	1
Independent company	91	0.6	0.6	90	0.46	0.46	87	0.91	1
Liquidated	14	0.34	0.32	13	0.14	0.07	11	0.85	1
Total	129	0.55	0.57	125	0.38	0.29	120	0.88	1
<u>Diff. PE vs non-PE</u>									
Acquired by financial buyer		-0.19	-0.11 *		-0.08	-0.17		-0.07	0.11
Acquired by strategic buyer		0.06	0.05		0.07	-0.07		0.12	0
Independent company		-0.08	-0.11 **		-0.16	-0.21 ***		-0.05	0
Liquidated		-0.03	-0.07		-0.11	-0.06 **		-0.37	-0.62***
Total		-0.06	-0.1 *		-0.13	-0.09 ***		-0.07	0**

**Table 6: Determinants of company filing for bankruptcy after default**

Probit regressions of the likelihood of the firm ending up in bankruptcy rather than resolving distress out of court (specifications (1) through (4)) and the likelihood of a bankruptcy not being a pre-packed filing (specifications (5) and (6)) for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. Tables shows marginal effects and t-statistics, which are statistically significant at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels using standard errors clustered by default year. (In specifications (3) and (4), all PE-backed firms with bonds outstanding filed for bankruptcy; hence the 16 observations with bonds outstanding were dropped.)

VARIABLES	(1) Default results in bankruptcy filing	(2) Default results in bankruptcy filing	(3) Default results in bankruptcy filing (PE-backed and Preqin-data only)	(4) Default results in bankruptcy filing (PE-backed only)	(5) Non-prepack bankruptcy (Bankruptcies only)	(6) Non-prepack bankruptcy (Bankruptcies only)
PE-backed	-0.005	0.038			-0.194***	-0.167***
	-0.117	0.694			-5.270	-2.871
Industry sales	-0.113	-0.173	2.200***	2.197***	0.106	-0.113
growth, year of default	-0.352	-0.352	2.293	3.419	0.423	-0.329
Log Firm Sales		0.018	0.069	-0.020		0.006
		1.093	0.697	-0.471		0.269
Firm EBITDA>0		0.014	0.150	0.093		-0.084
		0.270	0.909	0.845		-1.081
Bonds outstanding	0.164***	0.179***			-0.190***	-0.171**
	5.217	4.820			-2.591	-2.245
Publicly traded	-0.025	0.066	-0.158		-0.055	-0.037
	-0.677	1.479	-0.917		-1.469	-1.022
No. months since last financing	-0.001	-0.002	-0.003	-0.001	0.001	0.000
	-1.100	-1.357	-0.445	-0.232	0.352	0.029
Any recap within 3 years of default	-0.040	-0.030	-0.118	-0.038	0.036	0.094
	-0.667	-0.278	-0.438	-0.255	0.607	1.319
PE sponsor age at default (years)			-0.018	-0.012		
			-1.028	-1.108		
Size of LBO fund / Firm debt (at last financials)			-0.005**	-0.005*		
			-2.424	-1.883		
PE fund age at default (years)			0.086***	0.079***		
			5.224	7.217		
Has Preqin PE- fund data				-0.122		
				-0.649		
GDP growth, default year			0.086			
			1.628			
Last 12 months default frequency (Moody's)			1.320			
			0.457			
Year fixed-effects	Yes	Yes	No	Yes	Yes	Yes
Pseudo-R2	0.104	0.122	0.405	0.296	0.142	0.132
Observations	510	381	42	136	390	288

**Table 7: Determinants of defaulted firm surviving as an independent company**

Probit regressions of the likelihood of the firm being reorganized or acquired by a financial buyer for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. Tables shows marginal effects and t-statistics, which are statistically significant at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels using standard errors clustered by default year.

VARIABLES	(1) Company survives as independent	(2) Company survives as independent	(3) Company survives as independent	(4) Company survives as independent PE-backed and Preqindata only	(5) Company survives as independent PE-backed only
PE-backed	0.106** 2.122	0.090** 2.076			
PE-backed*(EBITDA>0)			0.111*** 4.657		
PE-backed*(EBITDA<0)			-0.013 -0.086		
Industry sales growth	0.440** 2.019	0.651* 1.774	0.633* 1.711	0.985 1.150	0.343 0.728
Log Firm Sales		-0.011 -0.995	-0.014 -1.209	0.037 0.782	0.012 0.464
EBITDA>0		0.164*** 2.809	0.119 1.499	0.351** 2.189	0.271* 1.724
Bonds outstanding	0.192** 2.456	0.161* 1.801	0.162* 1.754	-0.233 -1.514	
Publicly traded	0.050 1.395	-0.017 -0.341	-0.024 -0.471	-0.180 -1.524	
Months since last financing	0.001 0.528	0.003* 1.748	0.003* 1.726	0.005 0.986	0.000 0.049
Recapitalization within last 3 years	0.010 0.107	0.005 0.041	0.012 0.090	-0.346 -1.473	0.018 0.087
GDP growth				0.010 0.335	
Trailing 12 month Moody's default rates				-0.122 -0.080	
PE firm age at default				0.014** 2.028	0.015** 2.044
Size of PE fund / Firm debt				0.001 0.170	0.003 0.876
Years since LBO fund was raised				-0.026* -1.651	-0.023 -1.475
Has Preqin PE-fund data					-0.170 -1.269
Year FE's	Yes	Yes	Yes	No	Yes
Pseudo R-squared	0.07	0.11	0.12	0.21	0.13
Observations	522	391	391	60	135

**Table 8: Determinants of the time spent in default**

OLS regressions of number of months in default on PE-backing and other control variables for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. Coefficients (with t-statistics below, calculated using standard errors clustered by default year) are statistically significant at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.

VARIABLES	(1) Months in default	(2) Months in default	(3) Months in default bankruptcies only	(4) Months in default	(5) Months in default PE-backed only	(6) Months in default PE-backed only
PE-backed	-3.627**	-2.172	-4.584**			
	-3.035	-1.490	-2.592			
PE-backed* (EBITDA>0)				-3.366**		
				-2.489		
PE-backed* (EBITDA<0)				4.529		
				1.242		
Industry sales growth, year of default	0.071	-2.568	-7.370	-1.401	-15.346	-9.265
Log Firm Sales	0.009	-0.255	-0.454	-0.145	-0.977	-0.755
		1.147*	1.244	1.283*	0.785	0.228
		2.107	1.537	2.088	0.364	0.273
EBITDA>0		2.378	3.135	4.690*	-1.762	-2.929
		0.999	0.998	1.910	-0.186	-0.644
Bonds outstanding	-2.806**	-3.046*	-4.831***	-3.031**	-6.205	-2.011
	-2.247	-2.095	-3.621	-2.294	-1.753	-0.858
Publicly traded	0.249	1.919	2.130	2.223	-0.791	2.967
	0.209	0.958	0.494	1.086	-0.288	1.530
No. months since last financing	-0.108**	-0.066	-0.050	-0.067	-0.103	-0.029
	-2.235	-1.636	-0.934	-1.582	-0.930	-0.396
Any recap within 3 years of default	-2.596	-2.149	-2.043	-2.199	2.161	1.898
	-1.004	-0.664	-0.625	-0.680	0.200	0.396
Delaware incorporation			0.473			
			0.381			
GDP growth, year of default					2.363***	
					3.930	
Last 12 months default frequency					-18.409	
					-0.298	
PE sponsor age at default, years					-0.105	0.012
					-1.026	0.074
Size of LBO fund / firm debt					-0.080**	-0.026
					-2.721	-0.447
PE fund age at default, years					-0.103	-0.510
					-0.108	-0.659
Has PE-fund data						2.832
						0.532
Time FE's	Yes	Yes	Yes	Yes	No	Yes
Observations	403	306	210	306	45	115
R-squared	0.197	0.183	0.254	0.195	0.308	0.223



**Table 9: Determinants of creditor recovery rates in default**

OLS regressions of recovery rates to bank loans and bonds on PE-backing and other control variables for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. Recovery rates are discounted recovery rates from Moody's. Coefficients (standard errors clustered by default year) are statistically significant using a rank-sum test at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Bank recovery rate	Bank recovery rate	Bank recovery rate	Bank recovery rate	Bonds recovery rate	Bonds recovery rate	Bonds recovery rate	Bonds recovery rate
PE-backed	-0.040	-0.062*		-0.072**	-0.132**	-0.164***		-0.177***
	-1.421	-2.177		-2.469	-2.977	-4.267		-3.983
PE-backed* (EBITDA>0)			-0.051*				-0.172***	
PE-backed* (EBITDA<0)			-0.150*				-0.088	
			-1.947				-1.008	
Industry sales growth	0.056	-0.028	-0.046	-0.009	0.462***	0.446*	0.459*	0.452**
	0.246	-0.134	-0.218	-0.043	4.102	2.186	2.216	2.438
Ln(Sales)		0.004	0.004	-0.008		-0.009	-0.009	-0.024*
		0.150	0.155	-0.268		-0.902	-0.839	-1.893
EBITDA>0		-0.055	-0.085*	-0.061		0.037	0.058	0.030
		-1.181	-2.133	-1.196		0.354	0.565	0.296
Bonds outstanding	0.353**	0.382*	0.376*	0.389*				
	2.823	2.158	2.099	2.140				
Publicly traded	-0.023	-0.089**	-0.093**	-0.096**	0.038	0.002	0.004	-0.002
	-0.477	-2.280	-2.363	-2.738	0.587	0.025	0.062	-0.038
GDP growth	0.006	0.044*	0.043*	0.047*	0.011	0.032	0.033	0.034
	0.151	1.925	1.890	2.090	0.404	0.915	0.930	0.979
Trailing 12 month default rates	-3.008	-1.652	-1.509	-0.713	0.370	-0.360	-0.442	0.458
	-0.970	-0.455	-0.436	-0.198	0.142	-0.092	-0.110	0.110
Months since last financing	-0.000	0.000	0.000	0.000	-0.001	-0.000	-0.000	-0.001
	-0.086	0.281	0.274	0.150	-0.775	-0.290	-0.272	-0.416
Recap in last three yrs	-0.147	-0.133	-0.130	-0.118	-0.065	-0.037	-0.044	-0.022
	-1.515	-1.018	-1.091	-0.911	-1.551	-0.920	-1.056	-0.516
Debt/Sales, last financing				-0.024				-0.026
				-1.746				-1.706
Constant	0.556*	0.630**	0.663**	0.712**	0.217	0.249	0.228	0.372*
	2.042	2.511	2.531	2.552	1.489	1.222	1.112	1.933
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	174	143	143	143	177	146	146	146
R-squared	0.174	0.254	0.258	0.263	0.331	0.359	0.360	0.367