

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 2,160 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. 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. Recovery rates to junior creditors, however, are lower for PE-backed firms.

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I. Introduction

Leveraged buyouts (LBOs) by private equity funds have played a dominant role in corporate finance for more than two decades, especially during the LBO “boom” years of the late 1980s and mid-2000s. By the end of 2006, private equity sponsors were engaged in transactions totaling more than \$800 billion per year, concurrently raising new capital equivalent to 1.5% of the total value of the U.S. stock market.¹ Recent LBO activity has been equally robust outside the U.S. Overall, the private equity industry has become a key financial sector for channeling resources to growing firms.

Academic studies of LBO behavior have mirrored the growth in the private equity market. In the wake of the 1980’s LBO boom, Jensen (1989) argued that the LBO organizational form, which combines high leverage, concentrated ownership, and high-powered incentives, is an efficient corporate governance structure for firms. This hypothesis was supported in empirical work studying the 1980’s buyouts, such as Kaplan (1989, 1991), Smith (1990), and Lichtenberger and Siegel (1987), which document significant gains in profitability, productivity, and financial performance for firms acquired in leveraged transactions. As the private equity market grew dramatically in the late 1990’s and 2000’s, subsequent work (such as Acharya and Kehoe (2008), Davis et al (2008, 2009), Guo et al. (2009), and Lerner et al (forthcoming)) investigated the economic impact of LBOs on firm performance using more recent data. By and large, these recent studies corroborate the positive view of the earlier ones, finding that LBOs have a positive effect on firm performance.² Guo et al. (2009), however, show that the large returns to U.S. public to private buyouts leading up to the financial crisis can be attributed as

¹ See Kaplan and Strömberg (2009).

² See e.g. Cumming, Siegel, and Wright (2007) and Kaplan and Strömberg (2009) for recent reviews of the academic studies of the private equity market.

much to tax benefits of increased leverage and overall increases in market valuation multiples as they can to operating gains.

While Jensen's (1989) original work emphasizes the positive effects of high leverage, the gains from leverage may be erased if it leads to costly financial distress. The bust in the LBO market in the early 1990's left a large fraction of LBOs in financial distress and bankruptcy.³ Kaplan and Stein (1993) showed that the LBO market became overheated in the late 1980's due to the cheap access to junk bond financing, leading to higher deal prices and excessive leverage. Using LBO data from 1980 to 2008, Axelson et al (2010) show that leverage and pricing levels in buyouts are driven by debt market conditions. "Cheap" credit markets, such as those observed in 2005 and 2006, lead to increased leverage in LBOs.⁴ Ljungqvist et al (2007) also show that the availability of funds for investment by private equity firms is associated with an increased investment rate, perhaps in lower quality deals. The easy credit markets, increased investment by PE sponsors, and increased use of leverage quickly ended following the first quarter of 2007, leaving concerns that the economic downturn would lead to a wave of defaults by PE backed firms.

Thus, in considering whether distress costs offset the economic gains from to active ownership and governance, private equity sponsors now play a major role as they manage financial distress of their portfolio companies. Indeed, following the recent downturn in credit markets, 190 companies with significant private equity backing defaulted on their debt during

³ Andrade and Kaplan (1998) study 31 1980s era buyouts that later become financially distressed and show that value increases from the buyout transaction net of costs of subsequent financial distress are still on average positive.

⁴ Axelson et al (2009) provide a model arguing that this pattern is driven by agency conflicts between the private equity fund and its investors, where the compensation contract of private equity fund partners give them an incentive to overinvest in LBO deals. When credit markets are "hot" and credit is easily available, the overinvestment problem will be exacerbated, leading to boom-bust patterns in the LBO market.

2008 and 263 in 2009.⁵ While private equity-backed defaults have declined so far in 2010, analysts expect a potentially large increase in defaults again as large amounts of PE-backed debt come due.⁶ So far, the academic literature has been largely silent on how private equity sponsors are likely to affect the process for managing financial distress.⁷ This paper attempts to fill that gap by studying the defaults and restructurings of private equity-backed firms that become financially distressed during the period January 1997 to April 2010. Our main goal is to discern how the involvement of private equity sponsors influences the outcome of these restructurings.

To conduct our analysis, we follow 2,161 “leveraged loan” borrowers rated by Moody’s over the period 1997 to 2010. Leveraged loan borrowers are below-investment-grade firms that issue debt in private markets, usually as syndicated loans or private placements of notes and bonds. Using a variety of sources, we track private equity entry and exit from these firms over our sample period. Among the 2,160 firms in our sample, approximately half (1,062) are PE-backed at some point during this period. We focus on the universe of leveraged borrowers for two important reasons. First, by definition, companies owned by PE firms are private, making the availability of information on the performance of these firms limited at best. By focusing on rated borrowers,⁸ we are able to track defaults and for some firms obtain more detailed financial information. Second, in comparing the defaults of PE vs. non-PE backed companies, our sample allows us to compare firms that have similar operational and credit-risk characteristics.

⁵ The default totals are collected by Thomas (2010) and reflect all payment defaults and Chapter 11 filings by companies with significant private equity backing, including smaller companies. For examples of the extensive press coverage given to private equity financial distress, see “Belly up to the Bar,” *The Deal* (January 23, 2009), “Gloomy Start to Year in U.S. with Business Failures Up and Deal Volumes Down,” *Dow Jones Online Financial News* (April 20, 2009).

⁶ See “\$640 Billion and 640 Days Later,” *Special Comment, Moody’s Global Corporate Finance* (November 2009)>

⁷ Exceptions are Demiroglu and James (2010), who examine the influence of private equity investor reputation on a variety of dimensions, including the likelihood that a portfolio company files for bankruptcy; and Wilson et al (2010), who study defaults among UK private companies and find that private equity sponsored LBOs are less likely to default compared to LBOs without a private equity fund sponsor.

⁸ We do not require that firms maintain a rating over the entire sample period; thus, many firms in our sample do not have a Moody’s loan rating for the full time they are PE owned.

Our analysis proceeds in two steps. First, we compare the default frequencies of PE-backed firms to the default frequencies of our control leveraged firms. The popular press often characterizes observed actions by PE sponsors, such as paying themselves large dividends via leveraged recapitalizations, as draining needed liquidity from PE-backed firms and putting the companies at increased risk of default.⁹ At the same time, based on Jensen (1989), if PE sponsors are skilled investors they may be able to turn around lagging companies. Their levered ownership positions give PE sponsors strong incentives to avoid financial distress. We examine these arguments directly by examining whether PE-backed firms more or less likely to default.

Specifically, we study default frequencies as well as whether certain actions taken by the PE sponsors, such as dividend recapitalizations, aggressive acquisition programs, and quick IPO “flips”, increase the likelihood of default.¹⁰ PE-backed firms default with greater frequency than the non PE-backed, control firms. The average annual default rate for PE-backed firms is 5.1%, compared with an annual default rate of 1.6% among the control firms in our sample. We also find higher default rates (average annual rate of 3%) for non-PE backed firms that were previously owned by PE sponsors within the last five years. We also study (not yet reported) how characteristics of the PE sponsors themselves are related to default likelihood, including the style and return performance of the sponsor, sponsor reputation, the size of the last fund raised, the timing of the last fund raised, and the age of the PE sponsor.¹¹

⁹ See “Profits for Buyout Firms as Company Debt Soared,” *New York Times* (October 4, 2009)

¹⁰ 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 “flips” to exit the stock. See “Private Equity: Tracking the Sponsors,” *Special Comment, Moody’s Global Corporate Finance* (January 2008).

¹¹ Specifically, we use a discrete time hazard model (see Shumway (1999)) for the probability of default, controlling for firm rating and using industry performance to proxy for firm specific financial ratios typically used in this literature, and including variables related to PE ownership and actions. These results will be available shortly from the authors.

Second, we focus on the subset of borrowers that in fact become financially distressed, and examine the outcomes of these restructurings by comparing the restructuring type (out of court versus bankruptcy restructurings), time in distress, and recovery rates for PE vs. non-PE backed defaults. As in the regressions for the probability of default, we investigate whether characteristics of the buyout and PE sponsor influence the restructuring.

At first glance, there may be little reason to believe that PE-backed restructurings will differ substantially from restructurings by non PE-backed firms. Since distressed firms are typically insolvent, the pre-default owners have no residual claim and should have little or no say in the restructuring. Yet private equity investors could have a strong influence on the viability of a company by providing additional equity capital in the early stages of distress, and by redoubling efforts to improve the operations of the firm. LBO funds may have an incentive to inject equity in a portfolio company in order to preserve their reputational capital with their lenders. The PE sponsor may assure that the defaulted firm is “prepped” for a smooth transition to new owners since its reputational capital also depends on how it treats other stakeholders in portfolio firms, including current management and employees. At the same time, PE sponsors may take actions to preserve the option value of their equity claim, potentially to the detriment of other claimants, or make take actions to increase their distributions prior to default, implying lower recovery rates if the firm subsequently fails.

Conditional on default, we show that PE-backed firms are more likely to successfully reorganize as independent companies after default, rather than be sold to another firm 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, while firms with unprofitable operations are more likely to be sold or liquidated when they are PE-backed. The

economically healthier firms are also more likely to resolve default in an out-of-court restructuring than in bankruptcy. Moreover, in court 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 characteristics constant.

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

These results all point in the direction of PE-funds facilitating the restructuring process, making the outcome of default more efficient. In contrast, we find that recovery rates to creditors are lower when the company is PE-backed. This is driven by lower recoveries to bonds for the PE-backed defaults, while bank loan recovery rates are not significantly different 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. Our finding may be due to the fact that PE-backed firms enter default with higher leverage, usually in the form of junior debt such as bonds.

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 default-specific dataset of restructurings. Section III presents our results, while Section IV describes ongoing work and concludes.

II. Data

II.a. Full sample of PE-backed and control firms

We have two goals in mind when collecting the data for this paper. 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 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. Many candidate control firms that are not PE-backed are also privately held and provide few financial disclosures.

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. Borrowers in this market are highly levered, high credit risk firms, and typically pay large spreads on the loans they receive.¹² 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.

From the original *Dealscan* and *Dealogic* lists, we keep only those firms that receive a non investment grade Moody’s issuer rating during the sample period. The Moody’s issuer rating assesses the ability of borrowers to honor senior unsecured debt obligations. They are assigned to all borrowers whose bank, bond, or other debt issues are rated by Moody’s. A firm “joins” our full sample panel when we observe its first leveraged financing in *Dealscan* or

¹² 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).

Dealogic, or we observe a leveraged loan rating from Moodys.¹³ A firm leaves our full sample either when it defaults or is acquired; non-PE owned firms also leave our sample if they do not subsequently maintain a non-investment grade rating from Moodys. Our sample consists of an unbalanced panel of 2,160 firms (which we refer to hereafter as our “full sample”).

We restrict our analysis to rated firms for several reasons. First, we use the Moody’s issuer ratings in our regressions to control for credit-related differences across our sample firms. Second, Moody’s DRS database provides a consistent record of issuer rating histories and defaults, allowing us to identify the subset of sample firms that become financially distressed, as well as information on the resolution of distress. Finally, having a Moody’s rating allows us to link these firms to Moody’s *Ultimate Recovery Database*, which contains estimates of recovery rates on all outstanding debt of the defaulted firm.¹⁴ The 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.

To divide our full sample according to whether the firms are PE-backed, we match information on private equity ownership to firms in our sample. Both *Dealscan* and *Dealogic* provide guidance on which leveraged borrowers are PE-backed by labeling leveraged loans as “sponsored” when a PE sponsor is involved in the financing of a company. We use these sponsor classifications as an initial indication of PE-backing. However, these classifications only reference points in time at which firms issue new debt. Therefore we hand collect the time series of ownership information for all of our firms during the sample period, 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

¹³ We begin our sample period in 1997 when Moodys began to rate loans; see Sufi (2007) for a description of this process.

¹⁴ See Zhang (2009) for analysis of firm-wide recovery rates.

themselves. We record the dates at which a PE sponsor enters as a controlling owner of a sample firm, exit dates, and other information about PE actions for portfolio firms.

We require that the following conditions are met for a firm to be classified as PE owned. First, 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 family holdings *if* these institutions are not holding the ownership stake within a private equity fund structure. Second, the PE fund must hold at least a 20% stake in the sample firm; PE funds that hold a stake of 20% or more but then drop significantly below that threshold are coded as an exit. We recognize that PE ownership may influence the firm even after the PE fund exit and therefore follow firms with significant ownership stakes up to seven years prior to the start of our sample in January 1997. These searches yield an unbalanced panel of PE-backed and control firms over the period January 1997 to December 2009. Of the 2,160 firms in our full sample, 1,062 (49%) are PE-backed at some point during the sample period.

To our full sample, we link information on past financings, financial characteristics, and credit ratings. We obtain information on past financings from *Dealscan*, including the date and amount, and purpose of all debt financings over the sample period. *Dealscan* also provides a measure of size – firm sales – at the time of each financing. Additional financial characteristics, including measures of size, leverage, and profitability for public firms are obtained when available from Moodys Financial Metrics database (for years 2004 through 2010) or *Compustat*. Because detailed financial characteristics are unavailable for a substantial proportion of our

sample, we rely on industry-level medians for measures of size, leverage, and profitability using Fama-French industry groups.

II.b. Defaults in the full sample

To compare default frequencies among PE-backed and control firms, and to explore impact of PE ownership on the resolution of financial distress, we rely on defaults reported in Moody's *Default Risk Service (DRS)*. 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."¹⁵ To the Moody's recorded defaults, we add a small number of additional defaults (from the sources above) that are not picked up by Moody's when a sample firm's rating is withdrawn prior to default.

Table 1 summarizes the annual default frequencies of the firms in the full sample, sorted by whether they were PE-backed in the year of the default, PE-backed within the last five years prior to default, or non PE-backed. The pattern that emerges across all the years is that PE-backed firms have a higher default frequency than the non PE-backed, control firms. Annual PE-backed default rates range between 0.8% (2007) and 15.1% (2009), while control-firm defaults range between 0.3% (2007) and 5.4% (2009). Annual PE-backed defaults exceed control defaults in every year in our sample, though both sets of firms experience their peak default rates in the same years, 2001 and 2008. Table 1 also shows that default rates are higher in firms in which a PE sponsor has exited within the prior five years. Former PE firm defaults average 3.0% per year through the sample period and peak at 10.5% in 2008. Approximately

¹⁵ 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). Some market participants assert that Moody's inclusion of debt repurchases at discounts overstates financial default frequencies since healthy companies could, given the opportunity, retire debt by repurchasing that debt when it is trading at a discount. Such repurchases have been especially prevalent among PE-backed companies (Thomas (2010)).

one-quarter (25.4%) of all PE-backed and former PE firms present in our sample in 2008 experience a default.¹⁶

III. Resolving financial distress

III.a. Default sample description

Our analysis of the full sample yields a subsample of both PE and non-PE backed firms that default at some time during our sample period. For these firms, we code additional information on how the firm restructures to resolve its financial distress. Moody's DRS dataset contains rudimentary information about the restructuring including, the original 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. Often, the Moody's information is missing or incomplete.

We build extensively on the Moody's *DRS* information by using *TheDeal Pipeline's* bankruptcy database, *Edgar*, and online news sources to obtain additional information about the restructuring. For each defaulted firm, we record the type of restructuring -- when it was missing from Moody's -- and expand to code all pre-arranged Chapter 11 filings, a distinction that that is overlooked in the Moody's data. Like prepackaged filings, prearranged Chapter 11 filings have a substantial proportion of the restructuring terms negotiated by the creditors and debtor in

¹⁶ Using a discrete time hazard model (Shumway (1999)), we calculate the probability of default as a function of firm characteristics. These characteristics include: 1) credit rating, 2) financial ratios used in prior research on default frequencies, as available, 3) current industry performance, available for all sample firms, 4) macroeconomic conditions or year dummies, and 5) ownership characteristics. For the subset of PE owned firms, we further include information on the financing history of the firm. Results will be available from the authors shortly.

advance of filing in court, making the Chapter 11 case move quickly.¹⁷ We then code the outcome of the restructuring into one of four categories: (1) reorganize as an independent company, (2) sell firm as a going concern to a financial buyer, (3) sell firm as a going concern to a strategic buyer, or (4) liquidate assets piecemeal. We identify the name of the investor, institution or party that gains control of the firm upon the resolution of distress, including whether it is the owner prior to the default.¹⁸

Table 2 compares PE- and non-PE defaults across a number of pre-default characteristics. A challenge in our analysis is finding financial information for companies since many of them are private at the time of default. This means that have consistent financial information for only 44% of the defaults. Although most of these are in our non-PE subsample, as many as 29% of PE-backed defaults are publicly traded at the default date. The majority of these companies are “reverse LBOs” (see Cao and Lerner (2009)) where the LBO has undergone an initial private offering, but the PE fund still owns a substantial stake (greater than 20%) in the company.

The first notable difference between the PE and non-PE subsamples is the size of the company. Using information from the time of the last bank loan financing (obtained from Dealscan) PE-backed companies have average (median) sales of \$1.7 billion (\$450 million) compared to \$2.9 billion (\$680 million) for non-PE-backed firms. These figures are only a rough measure of the size at default, since the last bank financing occurred on average roughly two years before the default date. Still, the size difference is confirmed for the subsample of

¹⁷ 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, “Pre-negotiated and Prepackaged Plans of Reorganization”, *Kirkland & Ellis LLP Overview of Client Representation Experience*, available at <http://www.kirkland.com/sitecontent.cfm?contentID=218§ion=5&subitemid=586&itemid=767>.

¹⁸ Since we are interested in the impact of a PE-investor on the default resolution, we characterize companies where the PE-fund exits before the onset of default as non-PE-backed. There are 15 defaults of former PE-backed companies that exit between 63 and 8 months before the default, of which only two exit within a year of the default. Reclassifying these as PE-backed would not affect or results in any material way.

publicly traded firms where we have Compustat data, where PE-backed firms have average (median) sales of \$2.7 billion (\$678 million) compared to \$3.8 billion (\$902 million) for non-PE-backed firms according to the last financial statement before default. The size difference also appears for the subsample of bankruptcies where we have information on assets and liabilities at the bankruptcy filing. PE-backed firms have average (median) assets of \$837 million (\$318 million) and average (median) liabilities of \$1 billion (\$482 million). For the non-PE-backed subsample the corresponding average (median) asset levels are \$3.2 billion (\$742 million) with liabilities of \$3.6 billion (\$708 million).

We then consider whether PE and non-PE defaults differ in terms of economic distress. Though we are restricted by the limited financial information for private firms, we can get some sense of economic performance by examining characteristics of firms in the same Fama-French 49 industry (similar to Axelson et al, 2009) in the default year. For two measures of operating performance, sales growth and the change in operating margins (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, however, we do find significant differences. In particular, PE-backed defaults have higher EBITDA/Sales ratios, and a higher fraction of PE-backed companies have positive EBITDA in the last financial statement before default (90% vs. 78%).

We also consider whether PE- and non-PE-backed firms default at different times across the economic cycle. Here, the evidence suggests that PE-backed firms are more likely to default as a result of a general economic downturn, based on the fact that the PE-backed subsample defaults in times of lower GDP growth and higher BBB-AAA bond spreads.

To summarize, although the PE-backed companies are in industries with similar economic performance as non-PE-backed ones, and PE-backed firms are more likely to be in distress due to a general economic downturn, the non-PE-backed firms are more likely to be individually economically distressed. This is consistent with the argument in Andrade and Kaplan (1998) that LBOs are more likely to default because of high leverage rather than underlying economic viability.

We also collect data on the debt structure of the defaulted firms before and at default. Previous literature (e.g. Gilson et al (1990)) argues that the complex debt structures can hamper the ability of defaulted firms to restructure their debt. We use two measures of debt complexity: the number of tranches in the latest bank loan deal (from Dealscan) and a dummy for whether the defaulted firms have bonds outstanding that are rated by Moody's. The PE-backed firms have a somewhat higher number of bank loan tranches (average 3.3 vs. 2.8), but a lower likelihood of having Moody's-rated bonds outstanding (31% vs. 36%).

Finally, we look at whether the defaulted firms undertook a recapitalization of their debt in the 3-year period preceding default in order to pay out a dividend or buy back shares. PE-funds have been criticized for an excessive use of such dividend recapitalizations, and it has been argued that these transactions contribute to future distress. We confirm that such recapitalizations are indeed more common preceding PE-backed defaults, although the overall frequency is quite low: 4.7% of our PE-backed defaults had a dividend recapitalization within 3 years of default, compared to 1.2% for the non-PE-backed defaults.

Table 3 shows the type of defaults that occur in our sample over the 1997-2010 period, as well as the proportion of defaulted firms that is PE-backed. The default sample consists of 577 defaults, of which 236 involve PE-backed firms. Unlike the analysis in Table 1 where firms exit

the sample once they default, this part of our analysis includes a small number of multiple default events for a single firm. As would be expected, more defaults occur in the recession period of 2000-2002 (195 defaults) and post-crisis period of 2008-2010 (197 defaults). The fraction of defaults that is PE-backed increases over time; for the 2008-2010 period, approximately 50% of all defaults involve PE-backed companies.

74% of default observations are Chapter 11 bankruptcies and 26% are out-of-court restructurings. Among the bankruptcies, we distinguish between pre-packed bankruptcies, where a reorganization plan has been negotiated before filing (19% of defaults) and other Chapter 11 filings (55% of defaults). We characterize out-of-court restructurings that are unsuccessful and eventually end up in bankruptcy as bankruptcies. Among the out-of-court restructurings, distressed exchanges are the most common type (17% of defaults), while other out-of-court workouts are relatively rare (8% of defaults).

Comparing PE-backed to other defaults, the most striking difference is a significantly higher fraction of pre-negotiated bankruptcies. Pre-packs account for 28% of defaults for the PE subsample compared to 14% of defaults for the non-PE subsample. In addition, PE-backed firms are somewhat more likely to restructure out of court (28% vs. 24% of defaults). This suggests that PE-backed firms are more active in negotiating with their creditors out of court before resorting to a bankruptcy filing.

III.b. Restructuring outcomes

i. In versus out of court restructurings

In Table 4, we test whether the PE-backed defaults are more likely to file for bankruptcy rather than restructure out of court, using probit regressions that control for various pre-default

characteristics. In regression (1), without controlling for individual firm economic performance, the coefficient for PE-backing is insignificant, and the probability of bankruptcy seems largely driven by firm size, with larger firms being less likely to restructure out of court. Restricting the analysis to the Compustat subsample (2), which enables us to control for the degree of economic distress in the company, we find that PE-backed firms are significantly less likely to file for bankruptcy. Interestingly, when we split the sample depending on whether the firm has positive or negative EBITDA at the last pre-default financial statement (regressions (5) and (6)), we find that this result is only present in the firms that have positive profits, i.e. the ones that are not economically distressed. For firms with negative profits, PE-backed firms are more likely to file for bankruptcy (though the sample size becomes quite small). In other words, the presence of a PE owner is associated with a greater likelihood of reorganizing out of court when the underlying firm is economically healthy. In addition, there is some support to the complexity argument, with firms with public bonds outstanding being significantly more likely to file for bankruptcy.

ii. Ultimate default outcome

We turn to the ultimate outcome of the default restructuring in Table 5. We distinguish between the four different restructuring outcomes (described above). In 64% of all defaults, the company reorganizes successfully in bankruptcy or out-of-court; 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 only significant univariate difference in the overall sample is that PE-backed firms are less likely to be liquidated (11% for PE vs. 16% for non-PE).

Table 6 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, including the observations without financial data (regression (1)), the likelihood of remaining an independent company is significantly higher for PE-backed firms, with a marginal effect of approximately 0.10. When we control for individual firm conditions (regression (2)), the PE coefficient is no longer significant, and a major driver of the firm remaining independent is that it has positive EBITDA. Distinguishing profitable and unprofitable firms (regressions (7) and (8)), however, provides a clearer picture. In particular, for profitable firms, the presence of a PE investor significantly increases the likelihood of the firm remaining independent, with a marginal effect of 0.15. 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 with PE-investors present, with profitable firms being saved and unprofitable firms being acquired or liquidated.

Table 7 addresses another 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 identify of a controlling owner, if any. The most common case is that the equity is controlled by a pre-bankruptcy creditors – either by the

banks (20% of cases), a hedge fund (10% of cases), or a creditor 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, control is taken by a PE investor after bankruptcy, though different from the pre-bankruptcy owner. 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. Time in default

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 in forms of advisors fees and indirect in terms of the negative effects of liquidity constraints on the company’s operations – quicker resolution should be associated with higher efficiency. The univariate analysis in Table 8 shows that the median time in default 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, with PE-backed firms having shorter default times for all sub-periods in the sample.

Table 9 confirms this result in a multivariate regression analysis, where the PE-dummy is consistently significant with a coefficient between -3 and -5 months. Similar to the earlier results, the increased efficiency is particularly pronounced among firms that are profitable going into default. Other factors affecting the time in default are the size of the firm (which increases default time), the number of bank loan tranches (which increases default time), and having 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. Together with the earlier results on restructuring outcome, the default time results yield additional support to PE investors facilitating the resolution of financial distress.

iv. Recovery rates

To consider the efficiency of distress resolution at the overall firm level, it is useful to look at 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.

Univariate descriptive statistics on Moody's discounted recovery rates for bank loans and bonds is provided in Table 10, both for the overall firm and for bonds and bank loans

individually.¹⁹ 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 PE on the restructuring outcome or time in default, PE-backed defaults are associated with a 6% lower recovery rates to creditors overall. This is particularly pronounced for bond recoveries, with 13% lower recovery rates for PE-backed versus non-PE-backed defaults.

Table 11 shows that this result carries through in the multivariate analysis. PE-backed firms have bond recovery rates that are up to 13% lower than non-PE-backed firms, while the bank recovery rates are not significantly different. A likely explanation for this finding is that PE-backed firms enter default with larger debt levels (consistent with their lower asset to debt ratios in bankruptcy). Alternatively, PE-backed firms may be more successful in gaining concessions from bondholders, perhaps by contributing new equity into the firm in the restructuring.

IV. Conclusions and next steps

Our results at this stage in our analysis can be summarized as follows. First, we show that PE-backed firms default with greater frequency than non PE-backed control firms. Second, conditional on default, PE-backed firms are more likely to remain independent firms after default compared with similar non PE-backed firms, rather than be sold to another company or liquidated piecemeal. This result is driven by PE-backed firms being more likely to survive when they are only financially rather than economically distressed, while firms with unprofitable

¹⁹ 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.

operations are more likely to be sold or liquidated when they are PE-backed. Moreover, PE-backed reorganizations are resolved more quickly than for non PE-backed firms. These results suggest that PE-backing improves the screening process in bankruptcy, increasing the likelihood that economically viable firms are successfully reorganized. 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-backed. This is driven by a lower recovery to bonds for the PE-backed defaults, while bank loan recovery rates are not significantly different 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. We are in the process of collecting more data on pre-default capital structures. In light of the positive efficiency results on restructuring outcome and time in default, we believe there are two likely explanations for the lower creditor recoveries. First, PE-backed firms may enter default with greater debt levels, largely consisting of junior debt such as bonds. Second, PE-backed firms may be more successful in restructuring their debt and gaining concessions from bondholders, perhaps by contributing more new equity into the firm in the restructuring. Our additional data should enable us to address these two potential explanations.

Further, we have collected data on the characteristics of the private equity funds in our sample. If PE-backing makes the resolution of financial distress more efficient, we would like to understand why. One possibility is that the presence of a well-capitalized deep-pocketed

shareholder, who can put in more equity in the company if necessary, mitigates the debt overhang problem and facilitates the renegotiation with creditors. If this is true, then PE funds with more capital available in their fund should have a more efficient restructuring outcome. Another possibility is that the reputational capital of the PE sponsor helps in renegotiating with creditors. In this case, more reputable PE sponsors should be associated with more efficient restructuring outcomes. This additional information will be incorporated both into our hazard models predicting default, as well as our analysis of restructuring outcomes for defaulted firms.

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Table 1
Default frequencies

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.

Default year	Non PE		PE owned		PE exited		Total default frequency
	# in sample	% defaults	# in sample	% defaults	# in sample	% defaults	
1998	1,801	0.5%	170	1.2%	48	2.1%	0.6%
1999	1,710	1.2%	240	5.0%	54	7.4%	1.8%
2000	1,618	2.2%	304	6.6%	55	0.0%	2.8%
2001	1,552	2.6%	323	9.6%	51	3.9%	3.8%
2002	1,483	2.3%	321	6.2%	59	0.0%	2.9%
2003	1,406	1.4%	322	3.7%	55	5.5%	2.0%
2004	1,316	1.0%	338	3.0%	68	1.5%	1.4%
2005	1,218	0.8%	371	2.2%	98	1.0%	1.1%
2006	1,138	0.5%	382	2.4%	127	0.0%	0.9%
2007	1,057	0.3%	399	0.8%	149	0.0%	0.4%
2008	990	2.1%	395	8.1%	164	3.0%	3.7%
2009	975	5.4%	383	15.1%	136	10.3%	8.4%
2010Q1	965	0.2%	335	2.7%	98	4.1%	1.1%
All years	17,229	1.6%	4,283	5.3%	1,162	3.0%	2.3%

Table 2: Defaulted company characteristics

Descriptive statistics for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 236 companies that were owned by private equity funds at the time of default (PE-backed) and 341 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.

		PE-backed	Non-PE-backed	Total
Company public at default	N	235	342	577
	Mean	0.294	0.547	0.444 ***
	Median	0	1	0
EBITDA/Sales t-1 (Compustat)	N	69	186	255
	Mean	0.093	0.057	0.067 **
	Median	0.08	0.058	0.062
EBITDA>0, Compustat	N	69	187	256
	Mean	0.899	0.781	0.812 **
	Median	1	1	1
Sales (t-1), Compustat	N	69	189	258
	Mean	2681.398	3842.318	3531.839 *
	Median	677.886	902.183	819.052
Sales growth (Compustat)	N	67	186	253
	Mean	0.011	0.081	0.063
	Median	-0.046	-0.019	-0.03
Sales at last financing (Dealscan)	N	178	260	438
	Mean	1659.238	2925.511	2410.907 ***
	Median	450.192	680.758	518.444
Industry sales growth (default year)	N	235	341	576
	Mean	0.051	0.059	0.056
	Median	0.058	0.059	0.059
Industry ch. in operating margin (def. yr)	N	235	341	576
	Mean	-0.005	-0.003	-0.004
	Median	-0.003	-0.002	-0.002
GDP growth	N	235	339	574
	Mean	0.881	1.396	1.185
	Median	1.5	1.875	1.825 **
AAA-BBB spread	N	235	339	574
	Mean	1.412	1.289	1.339
	Median	1.18	1.01	1.11 **
Trailing S&P500 return	N	232	335	567
	Mean	-0.1	-0.071	-0.082
	Median	-0.121	-0.061	-0.08
Months since last bank loan (Dealscan)	N	200	297	497
	Mean	25.675	25.785	25.74 ***
	Median	24	20	22
Recapitalization in last 3 years	N	235	342	577
	Mean	0.051	0.006	0.024 ***
	Median	0	0	0
Dividend or share buyback in last 3 years	N	235	342	577
	Mean	0.047	0.012	0.026 ***
	Median	0	0	0
Bonds outstanding at default	N	235	342	577
	Mean	0.311	0.365	0.343
	Median	1	1	1

Number of tranches in last bank loan	N	204	300	504
	Mean	3.328	2.77	2.996 ***
	Median	2	1	2
Assets/Liabilities at Ch. 11 filing	N	110	171	281
	Mean	0.762	1.102	0.969 ***
	Median	0.782	1	0.951
Liabilities at Ch. 11 filing	N	110	171	281
	Mean	1002.771	3627.039	2599.745 ***
	Median	481.93	708.4	592.816
Assets at Ch.11 filing	N	110	171	281
	Mean	837.206	3174.328	2259.441 ***
	Median	318.039	742	523

Table 3: Defaults by year

Type of defaults for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 236 companies that were owned by private equity funds at the time of default (PE-backed) and 341 companies that were not (non-PE-backed).

By year	Chapter 11	Pre-packed	Distressed exchange	Other out-of-court	Total	% PE-backed
1997	2	2	1	1	6	17%
1998	9	3	1	0	13	23%
1999	28	8	5	1	42	38%
2000	44	8	2	6	60	28%
2001	55	7	6	10	78	41%
2002	31	11	8	7	57	39%
2003	26	6	3	4	39	46%
2004	17	4	5	3	29	38%
2005	13	6	3	2	24	42%
2006	9	4	2	0	15	33%
2007	8	7	2	0	17	47%
2008	36	13	8	1	58	50%
2009	34	29	49	12	124	45%
2010	4	4	5	2	15	53%
Total	316	112	100	49	577	41%
% of bankruptcies	55%	19%	17%	8%		
By type						
PE-backed	106	65	44	21	236	
% of bankruptcies	45%	28%	19%	9%		
Non-PE-backed	210	47	56	28	341	
% of bankruptcies	62%	14%	16%	8%		
KW-test of difference in % PE across restructuring types (with ties)						
Chi-squared (3 df)	21.117					
P-value	0.0001					

Table 4: 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 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.

	(1)	(2)	(3)	(4)	(5) EBITDA>0	(6) EBITDA<0
VARIABLES						
PE-backed	0.007	-0.132**	-0.006	-0.157**	-0.165**	0.106**
	0.133	-2.202	-0.101	-2.480	-2.291	2.442
Ln Sales at last financing	0.031**		0.026**			
	2.558		2.230			
Industry sales growth	0.089	-0.343	0.036	-0.436	0.021	-1.614**
	0.200	-0.620	0.073	-0.628	0.059	-2.437
Industry change in operating margins	-0.877	0.280	-1.015	-0.113	3.587	2.404**
	-0.638	0.097	-0.625	-0.034	1.075	2.460
months since last financing			-0.001	-0.002*		
			-1.269	-1.818		
Any recap within last 3 years			0.106	0.083		
			1.211	0.629		
More than five tranches, last financing			-0.063	0.056		
			-0.684	0.585		
Publicly traded bonds at default			0.185***	0.151***	0.199**	0.306***
			4.569	2.713	2.169	3.221
Ln Sales year before default			-0.020			
			-0.730			
Compustat EBITDA positive, t-1		0.042***		0.041***	0.021	0.115***
		3.461		2.921	1.475	2.681
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	425	247	413	211	198	37

Table 5: Default outcomes by type of default

Type of outcomes for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 236 companies that were owned by private equity funds at the time of default (PE-backed) and 341 companies that were not (non-PE-backed). Differences in default outcomes between the PE- and non-PE-backed subsamples are statistically significant using a rank-sum test at the 10% (*), 5% (**), and 1% (***) levels.

	<u>All defaults</u>					<u>Excluding ongoing</u>				
	Acquired by financial buyer	Acquired by strategic buyer	Independent company	Liquidated	Ongoing	Acquired by financial buyer	Acquired by strategic buyer	Independent company	Liquidated	Ongoing
N Total	32	52	370	81	42	32	52	370	81	42
<i>Whole sample</i>										
Bankruptcy (N=428)	7%	12%	53%	19%	10%	7%	13%	59%	21%	10%
Out of court (N=149)	3%	1%	97%	0%	0%	3%	1%	97%	0%	0%
Total	6%	9%	64%	14%	7%	6%	10%	69%	15%	7%
<i>PE-backed</i>										
Bankruptcy (N=170)	8%	12%	57%	15%	8%	8%	13%	62%	17%	8%
Out of court (N=65)	6%	2%	92%	0%	0%	6%	2%	92%	0%	0%
Total	7%	9%	67%	11%	6%	8%	10%	71%	12%	6%
<i>Non-PE-backed</i>										
Bankruptcy (N=258)	6%	12%	50%	21%	11%	7%	13%	56%	24%	11%
Out of court (N=84)	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%
Total	4%	9%	62%	16%	8%	5%	10%	68%	18%	8%
<i>Diff PE vs non</i>										
Bankruptcy	2%	0%	7%	-6%	-3%	2%	-1%	6%	-7%*	-3%
Out of court	6%**	2%	-8%**	0%	0%	6%	2%	-8%	0%	0%
Total	3%	0%	5%	-5%*	-2%	3%	0%	3%	-6%*	-2%

Table 6: Determinants of company remaining as an independent company after default

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.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Bankruptcy only		EBITDA>0	EBITDA<0
PE-backed	0.097**	0.131	0.110*	0.099	0.135*	0.058	0.153**	-0.505*
	2.262	1.636	1.917	0.984	1.691	0.406	2.301	-1.648
Ln Sales at last financing	-0.002		0.005		0.051			
	-0.175		0.328		1.133			
Industry sales growth	0.569**	0.243	0.705*	0.465	2.430***	2.788**	0.366	2.907
	2.062	0.558	1.867	0.918	3.773	2.018	0.485	1.504
Industry change in operating margins	0.320	2.142	-0.358	1.587	-12.004**	-15.949***	1.197	-0.138
	0.188	0.647	-0.187	0.453	-2.572	-2.656	0.455	-0.019
months since last financing			0.003*	0.004*	0.002	0.000		
			1.760	1.689	0.542	0.088		
Any recap within last 3 years			-0.072	0.130				
			-0.576	0.629				
More than five tranches, last financing			-0.014	-0.101				
			-0.314	-1.338				
Bonds outstanding			0.188***	0.209*	0.369***	0.445***		
			2.704	1.918	2.988	3.646		
Publicly traded at default			0.010					
			0.268					
Ln Sales year before default		-0.005		-0.017		-0.060	-0.020	-0.015
		-0.224		-0.634		-0.883	-0.704	-0.179
EBITDA positive, t-1		0.228**		0.215**		0.324*		
		2.079		2.109		1.889		
Log Debt at filing					-0.004	0.086		
					-0.085	1.560		
Assets / Liabilities at filing					-0.241**	-0.282**		
					-2.524	-2.540		
Delaware filing					0.092	-0.060		
					1.272	-0.630		
Year fixed effects								
Observations	437	255	431	223	328	178	192	42

Table 7: Controlling owner after bankruptcy

Type of controlling owner after bankruptcy for a sample of 216 U.S. companies that filed for Chapter 11 bankruptcy between 1997 and 2010 and emerged as an independently reorganized company or where acquired by a financial buyer.

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

Table 8: Time in default

Number of months in default for a sample of 577 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 236 companies that were owned by private equity funds at the time of default (PE-backed) and 341 companies that were not (non-PE-backed). Differences in default times 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: Whole Sample**Panel B: Bankruptcies only*

All observations

period	N	Mean	Median
1997-2006	331	15.6	13.0
2007-2008	56	9.1	9.0
2009-2010	66	5.5	6.0
Total	453	13.3	11.0

period	N	Mean	Median
1997-2006	288	17.4	14.0
2007-2008	53	9.5	9.0
2009-2010	53	6.5	6.0
Total	394	14.9	12.0

PE-backed

period	N	Mean	Median
1997-2006	123	12.6	11.0
2007-2008	29	7.6	6.0
2009-2010	33	4.6	5.0
Total	185	10.4	8.0

period	N	Mean	Median
1997-2006	107	14.1	13.0
2007-2008	27	8.0	7.0
2009-2010	27	5.4	6.0
Total	161	11.6	9.0

Non-PE-backed

period	N	Mean	Median
1997-2006	208	17.3	14.0
2007-2008	27	10.7	11.0
2009-2010	33	6.5	6.0
Total	268	15.3	12.0

period	N	Mean	Median
1997-2006	181	19.4	16.0
2007-2008	26	10.9	11.5
2009-2010	26	7.6	7.5
Total	233	17.2	13.0

Diff PE vs non

period	Mean	Median	
1997-2006	-4.66	-3	**
2007-2008	-3.12	-5	**
2009-2010	-1.9	-1	*
Total	-4.89	-4	***

period	Mean	Median	
1997-2006	-5.4	-3.0	***
2007-2008	-2.9	-4.5	**
2009-2010	-2.2	-1.5	*
Total	-5.6	-4.0	***

Table 9: 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 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)	(9)	(10)
						Bankruptcies only			EBITDA>0	EBITDA<0
PE-backed	-2.986**	-4.068***	-3.050**	-3.906**	-3.637***	-3.007**	-3.134*	-5.077*	-4.608**	7.773
	-2.507	-3.809	-2.321	-2.451	-3.044	-2.347	-1.888	-1.827	-2.999	0.684
Ln Sales at last financing	1.311**		1.127*		1.184*		0.826			
	2.367		2.124		2.107		0.622			
Industry sales growth	11.113	8.718	9.248	18.193	5.785	11.464	-13.418	-6.300	3.770	6.305
	0.969	0.887	0.775	1.398	0.459	0.707	-1.160	-0.378	0.300	0.067
Industry change in operating margins	-75.978*	-29.626	-70.289	-96.200	-79.262	-123.528**	72.088	-169.357	-62.531	79.115
	-1.876	-0.989	-1.383	-1.462	-1.614	-2.864	1.510	-1.239	-1.405	0.275
months since last financing			-0.052	-0.043	-0.029	0.008	-0.028	0.042	-0.043	0.268
			-1.640	-1.104	-0.937	0.154	-0.569	0.511	-1.098	0.613
Any recap within last 3 years			-2.964	-4.467						
			-1.231	-1.039						
More than five tranches, last financing			3.505*	7.736**						
			2.040	2.525						
Bonds outstanding			-3.276**	-6.288***	-4.254**	-7.822***	-6.614**	-12.410***	-5.653***	-10.310
			-2.199	-3.981	-2.636	-5.884	-2.496	-4.032	-3.056	-1.303
Publicly traded at default			0.215							
			0.167							
Ln Sales year before default		1.796**		2.203**		2.303***		2.258	2.016**	3.968
		2.211		2.857		3.042		1.611	2.565	0.957
Compustat EBITDA positive, t-1		-2.976		-2.494		-2.134		-0.215		
		-0.901		-0.827		-0.527		-0.050		
Log Debt at filing							0.007	-1.550		
							0.007	-0.943		
Assets / Liabilities at filing							1.303***	0.901**		
							4.290	2.263		
Delaware filing							0.778	-0.480		
							0.401	-0.153		
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	354	206	348	182	309	163	166	91	146	36
R-squared	0.171	0.219	0.185	0.276	0.187	0.269	0.372	0.517	0.272	0.436

Table 10: Creditor recovery rates

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 in recovery rates between the PE- and non-PE-backed subsamples are statistically significant using a rank-sum test at the 10% (*), 5% (**), and 1% (***) levels.

	<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 11: 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.

VARIABLES	(1) Banks	(2) Banks	(3) Banks	(4) Banks Bankr. only	(5) Bonds	(6) Bonds	(7) Bonds	(8) Bonds Bankr. only
PE-backed	-0.036	-0.020	-0.040	-0.053	-0.130**	-0.115**	-0.067	-0.100*
	-0.905	-0.721	-1.017	-0.716	-2.739	-2.570	-1.004	-2.078
Ln Sales year before default			-0.013				0.012	
			-0.553				0.652	
Industry sales growth	-0.088	0.025	-0.294	-0.891	0.470	0.563	0.493	1.887***
	-0.244	0.069	-0.632	-1.610	1.146	1.197	0.927	3.269
Industry change in operating margins	1.114	0.952	2.817**	1.800	0.328	0.176	1.354	-7.107***
	1.564	1.195	2.529	0.979	0.171	0.090	0.587	-3.302
Compustat EBITDA positive, t-1			-0.003				-0.031	
			-0.087				-0.323	
months since last financing		0.000	0.001	-0.001		-0.000	0.001	-0.001
		0.247	1.085	-1.051		-0.098	0.648	-0.547
Any recap within last 3 years		-0.164**	-0.216			-0.039	-0.066	
		-2.238	-0.909			-0.998	-0.730	
More than five tranches, last financing		-0.074**	-0.177**			-0.014	-0.141	
		-2.541	-2.659			-0.168	-1.196	
Bonds outstanding		0.338**	0.347*					
		2.789	2.112					
Ln Sales at last financing	-0.011	-0.001		-0.001	0.006	0.002		0.008
	-1.078	-0.060		-0.055	0.586	0.209		0.404
Publicly traded at default		-0.009				0.077		
		-0.371				1.607		
Log Debt at filing				-0.038				0.042**
				-1.023				2.723
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	170	167	95	83	171	168	98	82
R-squared	0.097	0.191	0.289	0.257	0.334	0.353	0.491	0.462