Private Equity and the Resolution of Financial Distress*

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Abstract

We explore the financial distress costs of private equity-backed firms by examining the default likelihood and restructuring behavior of 2,156 firms that obtained leveraged loan financing between 1997 and 2010. We show that PE-backed firms are no more likely to default during this period than other firms with similar leverage characteristics. When private equity-backed firms do become financially distressed, they are more likely to restructure out of court, take less time to complete a restructuring, and are more likely to survive as an independent going concern, compared to financially distressed peers that are not backed by a private equity investor. Private equity investors also frequently remain in control of their firm following the restructuring, an occurrence that is rare among non private equity owners. Private equity investors appear not to exacerbate the likelihood of financial distress and, when a default occurs, resolve the distress fairly efficiently.

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 to include the discipline of high leverage, concentrated ownership structure, and monitoring by private equity (PE) sponsors.[1] Relatively less attention has been given to the potential downside of these transactions, namely that high leverage increases the risk that PE portfolio firms become financially distressed.

The main goal of the paper is to discern how private equity owners influence both the risk of debt default and the resolution of financial distress. The impact that PE ownership has on the risk and severity of distress is unclear. On the one hand, actions by aggressive private equity owners to boost their financial return, such as leveraging up a firm to pay large dividends or to pursue acquisition programs, could drain needed liquidity from PE-owned firms and put these firms at a higher risk of default.[2] Some observers have accused PE backers of walking away, or even slowing down a restructuring of the firm, leaving little value in the company.[3] On the other hand, PE investors could play a positive role in avoiding defaults, and when defaults occur, in resolving financial distress efficiently. Jensen (1989) argues that PE owners have strong incentives to manage their firms efficiently and profitably, lowering the chance of financial

[1] 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.

[2] The theoretical model of Axelson et al (2009) shows that PE-funds have an incentive to lever up their portfolio companies due to agency problems between the fund and its investors. The empirical study by Axelson et al (forthcoming) provides evidence suggesting that PE-funds use excessive leverage, especially during ”hot” debt markets, which drives up transaction prices and lowers fund returns.

[3] For example, see “Profits for Buyout Firms as Company Debt Soared ,” *New York Times* (October 4, 2009) and “Private Equity Profits Called into Question”, *Financial Times* (January 23, 2012) . Political figures have picked up on this view and characterized PE sponsors as “locusts”, “vulture capitalists”, “looters”, and “vampires.”.See “Attracting Private Equity Becomes a National Sport in Europe”, *New York Times* (June 29, 2007), “Newt Gingrich Accuses Mitt Romney of ‘Looting’ during Bain Tenure”, *Washington Post* (January 10, 202), and “Taking a Whack at Romney’s Private Equity Past,” *BusinessWeek* (May 17, 2012)

distress. PE sponsors often have reserve funds that can be used to recapitalize a portfolio company that is in distress. Further, even when the PE sponsor's equity stake is "out of the money" in an insolvent firm, reputational concerns could propel the PE sponsor to not walk away, and instead assure that distress is resolved efficiently.[4]

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 default on their debt obligations than other firms with similar operational and financial characteristics. Second, we investigate how PE-backed companies that become financially distressed manage through the process of resolving their distress.

To conduct our analysis, we follow a set of 2,156 "leveraged loan" borrowers from the beginning of 1997 through April 2010, tracking when PE investors enter and exit as owners of these firms, and recording when these firms default. Borrowers in this market are highly leveraged, below investment-grade-credit firms that typically pay large spreads on the loans they receive. Virtually all LBO financing (except for the smallest deals) occurs through the leveraged loan 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 share many similarities to PE-backed companies. We exploit these similarities and treat non PE-backed firms as controls against which we can distinguish how PE ownership affects firm behavior, while controlling for characteristics common to highly leveraged firms in general. Among the 2,156 firms in our sample, about half (991) are PE-backed at some point during the sample period; the remaining firms constitute our control sample.

[4] There are several reasons why PE-firms may be concerned about their reputation. Demiroglu and James (2010) show that more reputable PE-firms pay lower loan rates and are able to obtain higher leverage in their buyout deals. Ivashina and Kovner (2011) show that PE-firms with long-term bank relationships obtain deal related financing at lower interest rates and with more favorable covenants than PE firms without a strong bank connection. Defaults leading to large creditor losses could damage the reputational capital built up by a PE firm.

We find that PE-backed firms have a higher observed annual default frequency than non PE-backed firms during our sample period (average 5.1% versus 3.4%). However, we also find that, within the set of leveraged loan borrowers, PE-backed firms carry more leverage than non PE-backed firms. Once we control for firm leverage through a default prediction model similar to the one developed by Shumway (2001), we find that differences in default probability between the two groups disappear. Moreover, while PE-backed firms are more likely than their non PE-backed peers to engage in leverage-increasing dividend recapitalizations and acquisition programs, the incidence of a dividend recapitalization or acquisition program has no influence on the likelihood of observing a default. Thus, PE owners are no more (or less) likely to become financially distressed than non PE owners with similar levels of debt, and leverage-increasing actions like dividend recapitalizations and active acquisitions -- popularly characterized by the media as evidence of "asset stripping" by PE owners -- appear to have no impact on the chance that a firm becomes financially distressed.

To assess how PE-backed firms manage the resolution of financial distress, we compare restructurings of defaulted PE-backed firms to that of their non PE-backed peers. We first show that financially distressed PE-backed firms restructure more often in consensual agreements outside of bankruptcy court, compared to distressed non PE-backed firms, which rely more heavily on in-court proceedings. When they do file for bankruptcy, PE-backed firms are more likely to reorganize through a pre-negotiated Ch. 11 plan than non PE-backed peers, who more often file traditional "free fall" Chapter 11 plans.

We next show that PE-backed restructurings resolve more quickly than non PE-backed restructurings. The median PE-backed firm in financial distress moves through its restructuring 4.4 months – or about 36% -- faster than a distressed non PE-backed firm. Differences in the

speed of the restructuring are not surprising given that the bulk of PE-backed defaults are resolved mostly out of court, either through consensual agreements or prearranged/prepackaged Chapter 11 plans agreements. However, we show that even among traditional free-fall Chapter 11 reorganizations, PE-backed firms restructure roughly three months (25%) more quickly than non PE-backed firms.

We also investigate restructuring outcomes as a function of PE ownership. In contrast to popular media characterizations that PE owners drain companies of value before leaving them bankrupt, we find that PE-backed firms are more likely than non PE-backed firms to exit a restructuring as an independent and viable going concern; non PE-backed firms are more likely to be liquidated piecemeal. We show that these results are not driven by the high incidence of PE-backed out-of-court restructurings, which nearly always result in a continuation of the firm. A restructuring is approximately 9% less likely to result in a liquidation or sale to a strategic buyer when a firm is PE-backed, whether the restructuring is in-court or out-of-court. Moreover, PE-backed firms are more likely to exit a distressed restructuring with the original owners – the PE firm – still in control of the firm. PE owners retain control of their distressed firms in 18% of the restructurings, while non PE owners retain control in only 4% of cases.

Overall, our analysis comparing PE-backed and non PE-backed firms in financial distress suggest that PE-backed firms resolve distress more easily, quickly and at a lower cost than similarly leveraged firms that are not backed by PE owners, and that PE-backed firms are more likely to survive the restructuring as an independent going concern. These findings are robust to a variety of regression controls, including time and industry fixed effects, as well of firm-level measures of leverage prior to financial distress, concentration of equity ownership, and severity of economic distress at the time of a default.

Lastly, we examine creditor recovery rates, measured at the point that the firm exits its restructuring. Recovery rates provide a measure, albeit imperfect, of the success of a distress-related restructuring by estimating how much value creditors recover from the restructuring relative to the original value of their claims. We find that, without further controls, recovery rates to creditors of PE-backed firms appear lower than those to non PE-backed firms. Mean recovery rates on PE-backed credits are 54% of original face value, compared to 58% for non PE-backed firms. However, these differences disappear once we control for firm characteristics and year and industry fixed effects; we detect no measurable difference in recovery rates between PE-backed and non PE-backed firms.

As a follow-on result, we find that PE investors play an important role in the transfer of assets of distressed companies. We show that PE investors are frequent acquirers of control of companies coming out of a successful Chapter 11 restructuring, independent of whether the firm was PE-backed or not prior to default. Approximately 35% of all firms filing for Chapter 11 in our sample exit Chapter 11 with a PE investor as the controlling owner of the company. Thus, PE investors appear not only to facilitate efficient restructurings of firms they owned prior to financial distress, but compete effectively to control the rehabilitation of distressed firms.

Prior to our work, 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. 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. Our paper differs from the two earlier studies by examining in a large sample on how PE investors impact the risk of

financial distress, and how PE owners influence the resolution of portfolio firms that become financially distressed.[5]

Our paper is also connected to recent papers that extend our understanding of the value of private equity investors within a competitive economy. These papers include Guo, Hotchkiss, and Song (2009) and Cohn, Mills, and Towery (2012), who examine the operating performance of PE-backed firms during the late 1990s and early 2000s, Harford and Kolasinski (2012), who study wealth creation by PE-backed firms following the exit of the PE owner, Lerner, Sørensen, and Strömberg (2010), who investigate the relation between PE investment and long-term investment, and Davis et al (2011), who study the impact of private equity investment on employment.[6] Among these papers, only Harford and Kolasinski (2012) include any analysis of PE-backed firms in financial distress. Consistent with our findings, they show that a PE sponsor's reliance on dividend recapitalizations has no impact on the probability of a PE-backed firm default. Their distress-related analysis stops there, and unlike our paper, includes no comparison of PE vs. non-PE backed default rates.

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. Full sample

[5] Another related paper is Asquith, Gertner, and Scharfstein (1994), who examine how highly-leveraged firms resolve financial distress. Although their sample of junk-bond issuers most likely includes a large fraction of PE-backed firms, they do not analyze the impact of PE-ownership on distress resolution in their paper.
[6] See Kaplan and Strömberg (2009) for an overview of much of this research.

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 owned 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. Borrowers in this market are financed with significant amounts of debt and are identified typically by the large spreads they pay on the loans they receive. The definition of what constitutes a leveraged loan spread varies across sources, but applies generally to spreads higher than 200 to 250 basis points above LIBOR (For more specifics on the leveraged loan market, see Yago and McCarthy (2004)). Within the leveraged loan sample, we track only those firms that receive a non investment grade Moody's issuer rating at some point during the sample period. Also, it is worth pointing out that using leveraged loans leads to a bias towards larger borrowers, since smaller loans are less likely to be syndicated.

Linking the leveraged loan data to Moody's produces a sample of 2,156 firms, which we refer to hereafter as our "full sample". Firms enter our panel when we first observe them raising debt financing from the leveraged loan market, or when we observe a below investment-grade loan rating for the first time.[7] Firms leave our panel when they default or are acquired by another firm, or when their credit rating rises above investment-grade. Firms are in our panel for

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

an average of seven years, yielding an unbalanced panel of 12,737 firm-year observations over the period 1997 to April 2010.

We restrict our analysis to Moody's rated issuers for several reasons. First, Moody's provides firm-level information and tracks its rated borrowers, whether they are publicly or privately owned. This enables us to follow a large sample of public and private firms, both PE-backed and non PE-backed. Second, Moody's produces a consistent measure of what constitutes an event of default that we can utilize across the entire sample. Moody's continues to follow firms after a default, and produces information about the restructuring. Third, we use the Moody's issuer ratings in our regressions to control for credit-related differences, including for the portion of our sample in which financial statements are unavailable. Finally, the Moody's rating allows us to link our sample to Moody's *Default & Recovery Database (DRD),* which contains basic information on how a default is resolved, as well as estimates of creditor recovery rates on the debt of defaulted firms.

II.b. Identifying PE-backed firms

From our full sample of leverage borrowers, we identify the subset of firms that are PE-backed. We define a firm to be "PE-backed" ("PE sponsored") when it is acquired through a leveraged buyout and held in a managed private equity fund for purposes of active control. A private equity fund is a limited liability partnership managed by a general partner who raises outside funding from a set of limited partners. Any leveraged borrower in our sample that does fit into the above criteria is labeled as "non PE-backed". Non PE-backed firms include public corporations with no controlling shareholder, as well as public and private companies that may be controlled by non PE investors, including hedge funds, investment management companies,

financial institutions, and other corporations. Controlling interests held by individuals and families are also considered non PE-backed.

We track PE-backing in a firm from the time the PE fund acquires the firm through the time the fund exits via an IPO, secondary sale, sale to a strategic firm, default, or some other path that relinquishes control. We piece together the time series of ownership information using a variety of sources, including *Capital IQ*, *Dealogic's Sponsor Analytics* database, *TheDeal Pipeline*'s Auction, M&A, and Bankruptcy databases, SEC *Edgar* archives, and the websites of the PE funds and sample firms. We record the dates at which a PE sponsor enters as a controlling owner of a sample firm, exit dates and type of exit, and other information about PE actions during ownership of the firm.[8]

To each firm in our full sample, we also 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 originate date, 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 are obtained from Compustat or Moodys Financial Metrics database (for years 2004 through 2010). For an additional portion of our sample that is not included in these databases, we hand collect financial data from SEC 10-Ks. For the remaining firms not filing 10-Ks in a given year, we rely on industry-level medians for measures of sales performance and profitability, using Fama-French industry groups calculated from COMPUSTAT data.

To identify defaults our full sample panel, we use Moody's *DRD*, which defines a default to be: (a) a missed interest or principal payment on a debt obligation, (b) a filing of a court-led

[8] We also search for PE ownership in the 7 years prior to the January 1997 start of our panel.

bankruptcy, or (c) the execution of an out-of-court "distressed exchange."[9] We include a small number of additional defaults that were missed by Moody's but identified from the sources described above.[10]

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 roughly a quarter of the sample, experience a default at some point between 1997 and 2010. The total number default events, 632, is higher than the number of defaulting firms because some firms experience more than one default during our sample 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 that also borrow in the leveraged loan market.

Panel B of Table 1 shows default frequencies for the PE-backed subsample based on the year of the original buyout, by calculating the proportion of buyouts within a given year that default within seven years of the buyout date. Note, therefore, that default frequencies for the years 2005 to 2009 are censored, since we do not observe firm behavior for the full seven years following default. LBO default rates vary substantially over the uncensored time period, ranging 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 2002-2004 are significantly than for those undertaken during the smaller boom of the late 1990's,

[9] A distressed ehxchange 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).
[10] 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.

and appear to remain relatively low for the period following 2004, although censoring clearly impacts the estimates in 2008 and 2009.

III. Likelihood of financial distress

Panel B of Table 1 suggests that defaults among PE-backed firms are fairly common occurrences and can vary significantly through time. In this section, we investigate whether PE-backed firms are inherently more likely to become financially distressed than non PE-backed firms by examining more closely the likelihood of observing Moody's defaults in these two groups.

III.a. Default probabilities of PE- and non PE-backed firms

We use the first four columns of Panel A of Table 2 to compare the annual default frequencies of PE-backed firms and non PE-backed firms, where for the purposes of the table we identify non PE-backed firms to be firms in which no PE fund has had a controlling ownership stake for at least five years. As is clear from the table, the fraction of PE-backed firms in our sample is higher at the end of our sample, reflecting the growth in the private equity market over this period. The columns show that PE-backed firms default at a rate of 5.1% per year on average during the sample period, compared to a rate of 3.4% for non PE-backed firms. The differences in average default rates appear to arise mostly in the late 1990s and early 2000s, when PE-backed firms default at a rate that is two to four percentage points higher than non PE-backed firms. Differences in default rates in later years, including during the financial crisis years of 2007-2009, are relatively similar between the two categories.

Non PE-backed firms that have experienced a recent exit of a private equity owner could experience higher default rates if the PE owners tend to drain the firm of resources and liquidity.

The last two columns Panel A of Table 2 report default rates for firms that were not PE-backed at the time of default, but were previously owned by a PE fund within the prior five years of the default.[11] These "PE exited" firms in fact default at a much lower average rate, 2.4%, than either PE backed firms or non PE backed firms with no recent history of a PE owner. Consistent with the findings in Harford and Kolasinksi (2012), the low default rates suggest the PE owners leave a firm in relatively good shape upon exit.

Panel B of Table 2 compares other financial characteristics through time of the PE-backed, non PE-backed, and PE exited firms. The first column under each of the three firm samples reports the average credit rating for the sample, where each firm's credit rating is measured as of the date of its last financing relative to the year in which the average is estimated. To calculate and report the averages, we map Moody's credit ratings into a numerical score with a 1 corresponding to the highest credit rating (Aaa) and 27 to the lowest credit rating (C). As leveraged loan borrowers, all firms in our study are high credit risk firms. Yet, we observe variation in credit risk across PE-backed and non PE-backed firms. In particular, Panel B of Table 2 shows that PE-backed firms have a lower average credit rating than do non PE-backed firms. The PE-backed average score of 20.3 corresponds approximately to a B2 rating, compared with a score of 18.2, or B credit rating for non PE-backed firms. As with default frequencies, the differences in credit ratings between the two categories is largest during the earlier part of our sample period; the ratings of non PE-backed leveraged borrowers deteriorate steadily throughout the sample period and converge to the B2 rating of PE-backed borrowers by 2009. 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

[11] If a PE owner exits via a secondary buyout by a second PE, the firm remains in our panel as a PE-backed firmed. When a PE exits via a sale to a strategic firm or default, the firm leaves our panel in that year. Thus, the only remaining PE-exited firms in our panel are IPOs and reverse LBOs.

(1991) who show that 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.

Panel B of Table 2 also studies the frequency in which firms undertake any recapitalizations or acquisition financings, as monitored and reported by Dealscan and Dealogic. We broadly define a recapitalization as any loan where the proceeds are used to refinance existing loans, raise new money for acquisitions or other investments, or pay dividends to shareholders. (In the regressions discussed below, we also more narrowly consider dividend recapitalizations only, which specify dividend payments as a use of proceeds). PE-funds have been criticized for an excessive use of leverage-increasing recapitalizations, especially dividend recaps, because these transactions are thought to contribute to future distress.[12] Consistent with these anecdotes, Panel B of Table 2 indicates that PE-backed firms are more than twice as likely -- 16.6% versus 8.1% -- than non PE-backed firms to engage in levearage-increasing recapitalizations. These PE-backed financings were popular during the LBO boom of the late 1990s and increased in popularity through the first decade of the 2000s.

The statistics in Table 2 suggest that PE-backed firms default more frequently, are more likely to engage in leverage increasing transactions, and have lower credit ratings than their non PE-backed peers. But drawing inferences from these statistics alone is misleading because we do not control for potential variation in firm and other characteristics across the sample. In the next section, we estimate a default probability model that controls for this variation.

III.b. Default probability regressions

[12] 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.

We examine the impact of PE ownership on default probabilities within a regression framework by estimating a discrete time hazard model of default using the methodology of Shumway (2001). This approach is similar to a panel logit model, but allows for the explanatory covariates and the conditional likelihood of default to vary through time. The regressions exploit panel observations on the 2,156 observations in our full sample of leverage loan borrowers, tracking which firms default and following firm, industry, and macroeconomic variables related to the firms over the period 1997-2010. The primary variable of interest is whether or not a firm is (*PE-backed)* to indicate whether a firm is currently PE-backed and firms owned by a PE fund in a given year.

For the basic set of regressions, reported in the first four columns of Table 3, we control annually for a variety of other variables that could influence the likelihood of default. Past PE ownership could affect the likelihood of default if PE owners drain the firm of need resources and liquidity prior to filing. Thus, we include the dummy variable PE-exited, which equals one when a PE-fund has exited within the last five years. Since firms with poor operating performance are more likely to suffer a financial default, we include three measures of performance, firm-level earnings before interest, taxes, depreciation, and amortization to sales (EBITDA/Sales), calculated using data from Compustat and 10-K filings when available, and two industry-level measures of performance, median sales growth and change in industry EBITDA/Sales, both calculated using Compustat firms in the same 4-digit SIC code and year. To control for differences in leverage across the sample, we use employ a firm-level long term debt to asset ratios, calculated using Compustat and 10-K information when available, and as a substitute that is available for more firms in our sample, the credit rating of the firm at the time of the last reported loan financing. 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 results in the first four columns of Table 3 can be summarized as follows. If we exclude a control for the amount of leverage held by the firm as of the last financing, then the PE-backed variable enters the regression with a positive and statistically significant estimate. However, once we control for leverage, using either the credit rating or long term debt to assets of the firm, the economic and statistical significance of disappears. Thus, holding levels of leverage constant across the full sample, PE-backed firms are no more -- and no less -- likely to default than non-PE backed firms. The 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.

The regressions also provide insight into the impact of leverage-increasing recapitalizations and acquisition-related financings on financial distress. While such activities are often singled out as evidence that PE funds are engaging in "asset stripping", we find that the incidence with which firms engage in these activities does not influence the likelihood that a firm defaults on its financial obligations. Indeed, our results suggest that firms that raise acquisition financing are actually less likely to default that other leveraged borrowers, holding other control variables constant. Our findings on this dimension are consistent with Harford and Kolasinski (2012), who show that the incidence of PE-backed firms paying special or large dividends to the PE owners is not associated with an increased likelihood of filing for bankruptcy.

We are also interested in whether characteristics of the PE fund and sponsor affect the likelihood of default. PE investors with cash available in their fund may have an ability to avoid financial distress by infusing capital into company to preclude default. Also, PE sponsors with more reputational capital, e.g. larger private equity firms that have raised multiple funds, may have a stronger incentive to avoid financial distress in their portfolio companies. These private equity sponsors may also be more experienced with avoiding financial defaults in the first place. Demiroglu and James (2008) and Ivashina and Kovner (2011) 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.

To explore the impact of PE characteristics, we estimate the hazard model for the subsample of PE-backed firms only, and add two additional reputation variables, both constructed using information matched from the private equity data provider Preqin. First, we the age of the PE sponsor, measured in years since its raised its first fund. We hypothesize that older PE firms are may be more experienced and reputable at avoiding financial distress. As a second measure of sponsor reputation, we include a variable that counts the number of funds raised by the private equity sponsor controlling the PE-backed company. We find that both variables enter with a negative and significant coefficient, hinting that more reputable and experienced PE investors can reduce the likelihood of financial distress.

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. Although popular among PE-backed firms, we find no evidence that dividend recapitalizations impact default probabilities, suggesting that such endeavors do not lead to the sort of asset stripping puts PE-backed firms at increase financial risk. Finally, we provide evidence that firms backed by more experienced or reputable PE investors default less frequently than younger and less reputable PE-backed firms.

IV. Resolving financial distress

We now turn to comparing how PE-backed and non PE-backed firms that become financially distressed resolve their distress. To do this, we collect information related to the restructuring of the defaulted firm, including the characteristics of the restructuring, the time taken to restructure, and the outcome of the restructuring. We also creditor calculate recovery rates and track who controls the restructured firms as the time distress is resolved.

IV.a. Summary statistics on defaulted firms

We collect our restructuring data starting with information in Moody's *DRD*, which contains rudimentary information about restructuring efforts, including the initial default date and whether the firm resolved its distress out of court or through a bankruptcy filing. For firms that file for bankruptcy, Mood's *DRD* also records the bankruptcy filing date, whether the bankruptcy filing was negotiated as a "prepackaged" bankruptcy, whether the firm was liquidated, sold as going concern, or reorganized independently, and the resolution date of the restructuring.

We compile restructuring information beyond what is available in the Moody's *DRD* using *Deal Pipeline's* Bankruptcy Database, Ch.11 disclosure statements, SEC filings, and web-

based news searches. For each defaulted firm, we code whether the type of restructuring was an out-of-court "distressed" exchange of debt for equity, a non-exchange out of court restructuring, a pre-negotiated Chapter 11 filing, either "prepackaged" or "prearranged", or a traditional, "free-fall" bankruptcy filing. We describe in more detail the distinctions between pre-packaged, pre-arranged, and free-fall bankruptcies in Section IV.b. below.

We differentiate outcomes of the restructuring as follows. A firm is either: (1) reorganized as an independent company, (2) sold as a going concern to a financial buyer, (3) sold as a going concern to a strategic buyer, or (4) liquidated piecemeal.[13] For our regressions, we fold these four outcomes into two by treating a reorganization or sale to a financial buyer as cases in which the company remains an independent company, and a strategic buyer or piecemeal liquidation as cases in which the company ceases as an independent concern. For cases in which the company is reorganized or sold, we also record the identity of the controlling owners of the company at the end of the restructuring, including whether or not the controlling owners at exit were the original owners of the company.

Table 4 reports a number of pre-default characteristics for PE-backed and non PE-backed firms that default. The sample includes a total of 623 default events, including 248 PE-backed defaults and 375 non PE-backed defaults.

Panel A of Table 4 shows that nearly 23% of PE-backed firms that default are publicly listed companies, compared with 39% of the defaulting non PE-backed firms, implying that a nontrivial portion of the PE-backed firms in our sample are either controlled through PIPEs (private investments in public equity) or buyouts that have been taken public but where the PE

[13] 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.

fund has not yet exited. In the regressions to follow, we use whether a firm is publicly listed as a proxy for ownership concentration under the assumption that private firms – whether controlled by a PE sponsor or via another private owner – have higher ownership concentration than publicly traded firms. A large proportion of our defaulting sample firms also have public debt in their capital structure, including 73% of the PE-backed firms and 83% of the non PE-backed firms. The presence of public debt has been interpreted as a proxy for the presence of a more complex capital debt structure in previous literature (e.g. Gilson et al (1990); Asquith et al (1989)), which argues that complex debt structures and holdout problems related to dispersely held debt can hamper the ability of defaulted firms to restructure. More recently, Ivashina, et al. (2012) argue that coordination among public debt investors is made especially difficult by the lack of a central "book" identifying bondholders in a given issue.

Two financial characteristics stand out in Panel A of Table 4 as distinguishing defaulting PE-backed firms from the defaulting non PE-backed firms in our sample: size, and leverage. PE-backed firms are smaller than non PE-backed firms. Measured at the time of the firm's last financing, the average PE-backed firms had sales of $1.385 billion (median = $466 million) and assets of $2.740 billion (median = $503 million), compared with sales of $2.908 billion (median = $781 million) and assets of $3.787 billion (median = $731 million) for non PE-backed firms. Also, consistent with the differences in credit ratings reported in Table 2, PE-backed firms are also more highly leveraged than non PE-backed firms. The median PE-backed firm financed 74.8% of its assets with long-term debt, compared with 49.9% of the capital structure of the median non PE-backed firm. The differences in leverage are not as distinct when measured relative to EBITDA, but PE-backed firms are still more likely than non PE-backed firms to have excessive leverage-to-EBITDA ratios above 5.0x and 10.0x. Finally, in terms of profitability,

which we measure by EBITDA over sales at the last financial statement before default, PE-backed firms are slightly more profitable (median of 7% for PE compared to 5.6% for non-PE), although the difference is not statistically significant. In the regressions reported below, we control for the variation across our sample in profitability, size, and leverage, along with a host of other variables.

Two other characteristics from Panel A of Table 4 reinforce the statistics reported in Table 2: Defaulting PE-backed firms are more likely than their non PE-backed peers to engage in dividend recapitalizations (7.2% of PE-backed firms compared with 1.6% of non PE-backed firms) and leverage-increasing recapitalizations in general (14.2% vs. 6.2%).[14] Table 3 suggests that dividend and other recapitalizations do not impact default probabilities. However, a history of dividend recapitalizations may "drain" a firm of capital and resources important to restructuring, so it is still an open question as to whether a recapitalizations influence the resolution of financial distress.

Panel B of Table 4 shows that PE-backed defaults are more likely to occur during times of worsening macroeconomic conditions. PE-backed defaults happen during years of lower industry sales growth, lower GDP growth, and higher creadit spreads compared to other defaults. In our regressions, we control for year dummies throughout to account for such differences in macroeconomic conditions.

Interestingly, Panel C of Table 4 shows that PE-backed firms are significantly more likely to file for bankruptcy in Delaware (56.6% of filings) compared to non-PE (37.6% 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

[14] 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.

such as LoPucki and Kalin (2001) and 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".

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.

Finally, Panel D summarizes some characteristics related to the PE sponsor and buyout deal for the PE-backed part of the subsample. In order to measure whether the PE firm is likely to have funds available to support a distressed portfolio company, we would like to know whether there is still funds available in the particular fund that made the deal.[15] Since we do not have information to calculate this variable directly, we use as a proxy the time between buyout and default.[16] The idea is that if the default takes place long after the initial deal, the fund will be older, and hence less likely to have funds remaining for follow-on investments. The defaults in our sample occur on average 56 months (median = 47 months) after the initial buyout deal.

IV.b. Restructuring process and outcomes: Summary Statistics

As mentioned above, we focus on several dimensions of the restructuring process to compare how PE-backed and non PE-backed firms resolve financial distress. Table 5 reports for the different restructuring statistics comparisons using simple summary statistics.

Panel A of Table 5 reports frequency distributions across our sample for different *restructuring types*. Across the entire sample, 77% of default observations are restructured through Chapter 11 bankruptcy filings and 23% are out-of-court restructurings.[17] Out-of-court

[15] PE funds are typically restricted from doing follow-on investment using capital from a different fund from the one that undertook the original investment. This means that as a fund becomes fully invested, it will be harder to make additional capital infusions into existing portfolio companies. See Gompers and Lerner (1996)

[16] For the vast majority of our buyout deals, we do not know exactly which fund of the sponsor that undertook the buyout, let alone how much uninvested capital remains in the fund.

[17] Out-of-court restructurings that are unsuccessful and subsequently file for Chapter 11 are characterized in our study as bankruptcies.

restructurings are less expensive than court-administered restructurings, and typically move much more quickly to resolution. Among the out-of-court restructurings, distressed exchanges are the most common (15% of defaults), while other out-of-court workouts are relatively less common (8% of defaults).[18]

Across bankruptcy filings, we distinguish between pre-negotiated bankruptcies (19%) and traditional Chapter 11 filings, also known as "free fall" bankruptcies (58% of defaults). We define a pre-negotiated bankruptcy to be a filing by a company that has already developed and negotiated a bankruptcy plan of reorganization prior to filing for bankruptcy. Firms file a pre-negotiated bankruptcy when they are able to do much of their negotiations out of court, but require court approval or intervention on some dimension that is available through the bankruptcy process, e.g., in order to cancel executory contracts such as leases, sell assets free and clear of liens, or raise debtor-in-possession (DIP) financing. Court voting rules can also be used to exclude or even "cram down" a plan on hold out creditors. There are two types of pre-negotiated bankruptcy filing. "Pre-packaged" bankruptcies are pre-negotiated filings that have already tabulated enough votes from all creditor classes to approve the plan. "Pre-arranged plans" have a substantial bloc of creditors on board, but typically not enough to quickly approve the plan.[19] In either case, a pre-negotiated filing means that a judge can move quickly through documents and motions to confirm the bankruptcy restructuring in a short period of time.

Panel A of Table 5 shows that PE-backed firms are much more likely to restructure out of court or through a pre-negotiated Ch. 11 filing than non PE-backed firms, which typically follow

[18] It is likely that we are missing information on out-of-court restructurings that occur without Moody's coding the debt as being in default, and hence would not turn up in our default sample. Unfortunately, there are no public sources available for systematically tracking such renegotiations.

[19] For a more in-depth description of pre-negotiated bankruptcy filings, see, "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.

a traditional free-fall route into Chapter 11 bankruptcy. Fully 52% of PE-backed firms restructure out of court (28%) or through a pre-negotiated filing (24%), compared with only 36% of non PE-backed firms (20% out of court, 16% prenegotiated).

Panel B of Table 5 shows that PE-backed firms resolve their restructurings roughly 40% faster than do non PE-backed firms. The panel reports the mean and median number of months that a firm takes to complete its restructuring, starting at the time of the default is announced and concluding when: (1) a distressed exchange or other out of court restructuring is completed, or (2) when a firm exits Chapter 11. PE-backed firms conclude their restructurings, on average, in 9.9 months (median = 7.7 months), compared with 16.6 months (median = 12.1 months) for firms that are not backed by a PE sponsor. This relationship holds across time in our sample, including during the 2007-09 financial crisis period. Given that PE-backed firms are more apt to restructure out of court or through a pre-negotiated Ch. 11 filing, it is perhaps not surprising that PE-backed restructurings are resolved more quickly than non PE-backed restructurings. However, we show in regressions below that this pattern persists for the subset of free-fall Ch. 11 filings; PE-backed firms continue to resolve their distress more quickly than non PE-backed firms.

To the extent that distress costs are lower for firms that achieve out of court restructurings and that resolve distress more quickly, Panels A and B suggests more efficient restructurings for PE-backed firms.

Panel C of Table 5 presents descriptive statistics on the outcome of the distressed restructuring. Across the entire sample, 69% of all defaults – resolved in and out of court – reorganize successfully as an independent going concern. Another 18% of the defaulted firms are sold to an acquirer; 6% of these firms are sold to an independent financial buyer, while 12%

are folded into a larger concern through a sale to a strategic buyer. In 13% of the defaults, the company is liquidated piecemeal. The only stand out difference in Panel C between PE-backed and non PE-backed restructuring outcomes is the relative frequency of reorganizations to liquidations. PE-backed firms reorganize at a higher rate (74% vs. 66%) and liquidate piecemeal at a lower rate (9% vs. 15%) than non PE-backed firms. That is, PE-backed firms are more likely to survive than non PE-backed firms to survive their default as a viable going concern.

Panel D of Table 5 examines the identities of the controlling owners of equity in restructured firms that exit a restructuring as an independent going concern, either through a reorganization or sale to a financial buyer. Ownership in a reorganized firm is transferred to the most junior set of claimholders that are still "in the money", given the estimated value of the bankrupt entity. These so-called "fulcrum" claimholders receive a majority of the new equity in a reorganized entity, either through an out-of-court, debt-for-equity exchange or via a court-led replacement of old equity with new shares. Oftentimes the claimholders are sophisticated investors who acquired the claims through secondary markets for distressed debt claims. Claimholders, including the original equityholders, that are "out of the money" at the time of the restructuring, can become the fulcrum security holders by paying off senior claimants and injecting new capital into the restructured firm.

Panel D of Table 5 indicates that private equity funds are significant players in the restructuring of financially distressed firms, independent of the private equity owners of defaulting firms. New private equity investors – that is PE investors that are not already owners of a defaulted firm -- take control of 19% of all defaulted firms in our sample, including a roughly equal proportion of firms that were and were not previously backed by PE firms. The typical PE investor that takes control of a defaulted firm by acquiring the firm outright out of

bankruptcy or by buying fulcrum debt claims. These firms also often specialize in the turnaround of financially distressed firms (Hotchkiss and Mooradian (1996)). Panel D also shows that banks (20% of the cases) and hedge funds (11% of cases) are also important controlling equity holders of firms that exit from financial distress. In 38% of the cases, we are unable to observe the identity of the controlling interest at exit.

The other notable statistic in Panel D of Table 5 is the proportion of original private equity owners that *remain* in control of their portfolio firm at the resolution of financial distress. Fully 18% of PE-backed firms exit a restructuring with the original PE owners still in control of the firm. By comparison, only 4% of the original controlling owners of non PE-backed firms remain in control of the firm as it exits its restructuring. Because the original equity of PE investors is wiped out at least as often in a default as the equity of non PE-backed firms (see Panel E of Table 5 and discussion below), it must be the case that private equity owners are more likely to: (1) Provide new capital into the defaulted firm to "buy" their way back into the capital structure, and (2) acquire claims in the fulcrum debt security so as to maintain control of the firm. In either case, the fact that PE owners work to retain control of their portfolio firms through financial distress indicates suggests that the owners have a positive view of the firms' turnaround potential.

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 all of the firm's creditors. In order to do this we use Moody's *DRD* information on creditor recoveries, defined to be the estimated percentage of pre-default face value that creditors recover through the restructuring. 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.[20] For the full sample, overall average recovery rates are 52% of the pre-default face value of debt. As we would expect based on their seniority, recoveries are higher for bank loans than for bonds (84% versus 33%). Recoveries are the highest when the firm is reorganized as an independent company (56%) and lowest when the firm is liquidated (35%) or acquired by a financial buyer (34%).

Unlike the positive effect of PEs on the restructuring outcome or time in default, Panel E of Table 5 suggests that PE-backed defaults are associated with a 6% lower recovery rates to creditors overall. This is particularly pronounced for bond recoveries in sales to financial buyers, where recovery rates are 17 percentage points lower for creditors of PE-backed firms, and reorganizations, where bond recoveries are 10% lower for PE-backed firms, compared to non PE-backed firms.

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 in which the dependent variable

[20] See Zhang (2009) for a description of 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.

is a one when a firm files for Ch.11 (either through a pre-negotiated or free fall filing) and zero when a firm restructures out of court. The regressions control for a variety of pre-default characteristics, including many of the variables reported in Table 4, as well as year and industry fixed effects. As discussed above, detailed firm-specific financial information is available only for a subset of our sample. We incorporate this information into our regressions without excluding observations with missing data by including an indicator variable that flags the firms for which financial information is missing. Typically, these are firms that provide no disclosures to the SEC. Each regression also contains a dummy variable, PE-backed, that equals one when a firm is controlled by a PE sponsor at the time of default. Regressions (1) and (2) evaluate the PE-backed dummy relative to other firms characteristics, while regressions (3) and (4) include additional information specific to the PE sponsor or fund.

The PE-backed variable is negative and statistically across all specifications in Table 6, indicating that PE-backed firms are less likely to file for Ch. 11 bankruptcy – and more likely to restructure out of court – than their non PE-backed peers. The estimates in regressions (1) and (2) suggest that PE-backed firms are roughly 5% less likely to file for Ch. 11 than non PE-backed firms, holding the other characteristics constant.

Table 6 also indicates that firms with public debt outstanding, and firms with high leverage (that is, debt/assets), also restructure more frequently out of court, holding ownership type and other variables constant. This result may seem counterintuitive, since the traditional thinking is that capital structures with more debt and complex and dispersely held components should be harder to restructure (see, e.g., Gilson et al (1990); Asquith et al (1989)). However, high leverage levels could also create a “tripwire” that induces companies to restructure early, before deteriorating to a point from where resolving financial distress becomes more difficult

(Jensen 1986). Moreover, creditors willing to provide more complex forms of debt, including through public bond issuances, may be more adept at moving quickly through a restructuring, including out of court. The magnitudes of these effects are economically meaningful; a defaulted firm with public bonds outstanding has almost a 6% higher likelihood of restructuring out of court.

The ability to restructure out of court may differ across PE investors. To examine this, regressions (3) and (4) include additional variables specific to the PE sponsor or fund, including the time (in months) since the PE-backed firm was acquired, the amount of leverage in the company as of last financing relative to the size of the PE fund, whether the PE sponsor has existed for more than 10 years, and whether the firm engaged in dividend and other leverage-increasing recapitalizations. The time since the PE firm was acquired and the amount of leverage relative to fund size are proxies for how much uncommitted capital, or "dry powder" exists within the PE fund to provide capital support to the PE-backed firm. We posit that firms acquired longer in the past and firms that have large debt service relative to the size of the fund will be more capital constrained. We use the age of the PE sponsor as a proxy for reputation and skill in restructuring, with older firms being more experienced with working through resolving financial distress. Finally, as discussed earlier, the debt recapitalization variables may indicate a tendency to withdraw needed cash from the firm at a time when the firm is in need of liquidity.

Consistent with older funds being more capital constrained, we find that the probability of observing a PE-backed Ch. 11 filing increases with the time since the LBO occurred. The results in column (3) show that the likelihood of failing to resolve distress out of court increases by 0.2% per month, or 2.4% per year. This gives at least partial support to the hypothesis that the ability of PE-funds to infuse more capital into a distressed firm helps these firms avoid

bankruptcy. Our other measure of fund capital constraints, debt over fund size, is not significant, however, although it has the consistent sign. In specification (4) we try to control for capital infusions directly by including a dummy for whether there were equity infusions in the company before default. This variable is not significant, however.

In specification (4) we also include indicators for whether dividend recapitalizations or other similar recapitalizations affect the ability of an out-of-court restructuring, neither of which has any significant impact.

The efficiency of the restructuring is also reflected in the time needed to resolve default. Table 7 reports regressions where the dependent variable is the number of months a firm takes to restructure, starting from the time the firm defaults and ending at the time the firm completes an out of court restructuring or exits a Chapter 11 bankruptcy filing. The regressions largely confirm the differences between PE and non-PE firms shown in the Table 5, Panel B univariate analysis. The first two specifications all defaults, including out-of-court restructurings. For these regressions, we use a Tobit specification because Moody's identifies some out-of-court default resolutions as occurring on the same day the default is announced, which leads to some clustering of times-to-default around zero. The next three specifications restricts the sample to Ch. 11 bankruptcies only, and use OLS regressions.

The PE-owned dummy is highly statistically significant across all five specifications, indicating that PE-backed defaults are resolved three to four months faster than other defaults. As can be seen from the last three regressions, the shorter time in default is not driven solely by out-of-court restructurings or pre-negotiated Chapter 11 filings; PE-backed firms move more quickly through a free-fall Chapter 11 than non PE-backed firms. The other variable that consistently explains the length in bankruptcy is, not surprisingly, the size of the company.

There is some indication that more leveraged firms, and firms with public debt outstanding, also resolve their default quicker, although the coefficients are not consistently significant across specifications.

Unlike the bankruptcy versus out-of-court results, the time-since-buyout has no significant effect on time in default, and neither has the other PE fund characteristics. In unreported results we also control for whether recapitalizations or capital infusions were undertaken before default, neither of which has a significant impact on time spent in default either. 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 other measure of efficiency is whether the firm survives as a going concern following the resolution of financial distress. Table 8 uses probit regressions to explain the restructuring outcome, controlling for various firm and industry characteristics. Because 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.

Overall, the likelihood of remaining an independent company is higher for PE-backed firms, and statistically significant when we control for industry fixed effects. The point estimates indicate that PE-backed firms are more than 8% more likely to survive as independent companies, compared to other defaulting firms. Again, this result is not driven by out-of-court restructurings, which are typically reorganizations; the findings persist for Chapter 11 bankruptcies only.

Another important determinant of firm survival is, naturally, the economic health of the industry and the firm's underlying operations. Table 8 also shows that firms in distressed industries, which are defined as industries where the median operating margin and sales growth are negative, are around 10% less likely to survive, while firms whose own operations are unprofitable and declining are 20% less likely to survive. These effects are even larger in magnitude within the subsample of bankrupt firms (-25% and -37% survival probability, respectively).

Finally, we find evidence that high leverage before default is associated with more efficient resolution of financial distress. A 10% increase in the debt to asset ratio in the last financial statement before default increases the likelihood of survival by around 2.5% (and as much as 4% in the subsample of Chapter 11 filings). This gives additional support to Jensen's (1989) hypothesis that higher leverage enables an easier restructuring of the company, since the company will default earlier, before the underlying operations have had time to deteriorate drastically.

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. Finally, neither leveraged recapitalizations, equity infusions (unreported), or PE characteristics seem to have any significant impact on firm survival.

Our final set of regressions considers the relationship between PE ownership and recovery rates for the subsample of Chapter 11 reorganizations in which we have recovery data from Moody's *DRD*. The univariate analysis suggests lower recovery rates for PE-backed firms, which is not (necessarily) consistent with more efficient default resolution. Table 9 shows, however, that this result is no longer present when we control for other variables, such as the financial health of the industry. Hence, the lower recovery rates for PE-backed firms seem to be driven by the fact that distressed PE-backed firms are clustered industries with lower recovery rates. Interestingly, firms having undergone dividend recapitalizations before default actually have significantly higher recovery rates, quite contrary to the asset-stripping argument. Finally, pre-packaged bankruptcies are associated with higher recovery rates (around 10%), while Delaware bankruptcies on average have lower recoveries (around -9%).

The fact that we do not see higher recovery rates for PE-backed firms, despite a quicker and more efficient resolution, is somewhat puzzling. One possibility is that the efficiency gains do not accrue to the old debtholders because PE-backed firms are more successful in gaining concessions from creditors. 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 these issues.

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 leverage or 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, PE-owned firms spend a shorter time in financial distress, and are more likely to resolve distress out of court, or through a pre-negotiated bankruptcy. We find some evidence that ability (or willingness) of PE-sponsors to facilitate a restructuring out of court is to be related to whether they have fund capital available to support the distressed firm. Third, 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. Moreover, the original private equity owners often – in nearly 20% of the cases -- retain controlling ownership of the successfully restructured firms, a rate of ownership retention that is unusual among firms in financial distress. Finally, we also document that the PE industry plays an important role as acquirers of bankrupt assets, independent of whether the assets were originally owned by PE investors.

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 no higher when the company is PE-owned. In light of the positive efficiency results on restructuring outcome and time in default, we believe that the likely explanation is that the positive effects on recovery rates are offset by PE-owned firms being more successful in restructuring their debt and gaining concessions from creditors, perhaps by owners contributing more new equity into the firm in the restructuring. Our additional data will hopefully 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 consisting of firms that are PE-backed 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)-backed	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-backed within 7 yrs prior to default	292	46.2%

Panel B: PE-backed subsample

Year of PE entry	# of PE entries	# that default within 7 yrs of entry	% defaults
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-backed at the start of our panel in 1997

Table 2: Default frequencies and other characteristics by year

This table reports annual default frequencies for as sample of 2,160 firms that were borrowers in the leverage loan market during the period 1997-2010. 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. PE-backed firms are owned a private equity fund. Non PE-backed firms have had no private equity owners for at least five years prior the year of the default calculation. PE exited had a private equity fund owner that exited in the firm within the last five years. 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 all out-of-court reorganizations, distressed debt exchanges, 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

	Non PE-backed		PE-backed		PE-exited		Total
Default year	# firms in sample	% that default	# firms in sample	% that default	# firms in sample	% that default	% 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-backed			PE-backed			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%
Average	**18.2**	**8.1%**	**41.6%**	**20.3**	**16.6%**	**47.5%**	**19.8**	**21.2%**	**56.1%**
	18.2	**8.12%**	**41.57%**	**20.3**	**16.56%**	**47.49%**	**19.8**	**21.15%**	**56.10%**

Table 3: Default probability regressions for the full sample

This table shows the results from a discrete time hazard model of default probabilities. The panel of data consists of 2,156 firms that borrow in the leveraged loan market, 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. PE-backed is an indicator variable that takes a value of one when a firm is owned by a private equity fund. PE exited equals one when a firm is no longer owned by a private equity firm but had a private equity owner within the last five years. EBITDA/Sales is a firm specific measure of profitability using the reported ratio of earnings before interest, taxes, depreciation, and amortization to sales, as reported at the time of financing by Dealscan or Dealogic. Industry median sales growth and change in EBITDA/Sales as controls are calculated using COMPUSTAT firms in the same 4-digit SIC code and year. Recap in past 5 years takes the value of one if, according to Dealscan or Dealogic, a firm engaged in a leverage-increasing recapitalization of existing debt within the last five years of the point measured. Similarly, Acquisition financing in past 5 years records whether or not a firm raised new debt in the form of an acquisition line of credit, according to Dealscan or Dealogic. S&P 500 return calculates the annual year-end return on the S&P 500. Rating at last financing is a firm's Moody's credit rating, measured as of the most recent financing. The credit rating is coded as a mapping into a numerical variable between 1 (AAA-rating) and 27 (C-rating). Long term debt/Assets at last financing uses Compustat measures of long-term debt and book value of assets to calculate a leverage ratio in the year of the last financing. PE fund age and Number of PE funds raised are measured for only the PE backed sample and measure the vintage of the private equity fund that contains a PE-backed sample firm and the number of PE funds raised by the general partner of the fund owning the PE-backed firm, respectively. The age of the Standard errors are adjusted as in Shumway (2001). Chi-square statistics are reported in parentheses and are statistically significant at the 1% (***), 5% (**), and 10% (*) levels.

	Full Sample				Sample with Compustat info				PE-backed sample only			
Intercept	-3.07	***	-10.51	***	-10.79	***	-3.43	***	-11.05	***	-10.69	***
	(45.40)		(121.20)		(102.40)		(42.03)		(105.72)		(110.99)	
PE-backed	0.60	***	0.00		-0.01		0.14					
	(9.85)		(0.00)		(0.00)		(0.33)					
PE-exited	-0.49		-0.66	**	-0.86	*	-0.77	*	-0.79	***	-0.60	***
	(2.00)		(4.44)		(3.70)		(3.10)		(15.12)		(8.54)	
EBITDA/sales	0.00											
	(0.03)											
Median industry change in sales	-2.67	*	-2.11		-2.09		-1.46		-1.43		-1.34	
	(2.83)		(1.86)		(1.56)		(0.74)		(0.74)		(0.77)	
Median industry change in EBITDA/sales	-9.43		-10.79		-8.60		-9.52		-11.16		-10.95	
	(1.86)		(2.21)		(1.24)		(1.51)		(1.70)		(2.08)	
Recap in past 5 years	-0.11		-0.11		-0.15		-0.13		0.00		-0.17	
	(0.17)		(0.18)		(0.22)		(0.18)		(0.00)		(0.66)	
Acquisition financing in past 5 years	-0.11		-0.10		-0.35	*	-0.34	*	-0.09		-0.08	

	(0.37)		(0.29)		(2.93)		(2.90)		(0.29)		(0.24)	
S&P 500 return	-0.04	***	-0.03	***	-0.04	***	-0.04	**	-0.03	***	-0.03	***
	(8.84)		(12.31)		(7.29)		(6.39)		(19.33)		(18.18)	
Rating at last financing			0.38	***	0.39	***			0.41	***	0.40	***
			(83.03)		(79.07)				(73.77)		(83.13)	
Long term debt / assets at last financing							1.12	***				
							(14.88)					
PE age									-0.0005	***		
									(12.42)			
Number of funds raised by PE											-0.05	**
											(6.09)	
N	9,413		8,559		5,507		5,507		1,967		3,540	

Table 4: Defaulted firm characteristics

Descriptive statistics for a sample of 623 U.S. companies that defaulted on their debt between 1997 and 2010. The sample includes 248 companies that were owned by private equity funds at the time of default (PE-backed) and 375 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. Unless otherwise noted, financial characteristics are measured as of the last financing prior to default.

A: Firm Characteristics

		Non PE-backed at default	PE-backed at default	Total	
Public company	*N*	375	248	621	
	Mean	0.392	0.229	0.327	***
	Median	0	0	0	
Public bonds outstanding	*N*	375	248	621	
	Mean	0.831	0.731	0.791	***
	Median	1	1	1	
Number of bond issues	*N*	375	248	621	
	Mean	3.892	2.177	3.205	***
	Median	2	1	1	
EBITDA/Sales (winsorized),	*N*	308	180	488	
	Mean	0.056	0.055	0.056	
	Median	0.056	0.070	0.060	
EBITDA >0	*N*	309	180	489	
	Mean	0.786	0.806	0.793	
	Median	1	1	1	
Sales ($ in millions)	*N*	314	197	511	
	Mean	$2,908	$1,385	$2,320.	***
	Median	$781	$466	$643	
Revenue growth (winsorized)	*N*	303	172	475	
	Mean	0.107	0.056	0.089	
	Median	-0.012	-0.001	-0.009	
Long-term debt ($ in millions)	*N*	267	154	421	
	Mean	$1,868	$1,075	$1,578	
	Median	$358	$353	$358	
Total assets ($ in millions)	*N*	282	133	415	
	Mean	$3,787	$2,740	$3,451	***
	Median	$713	$503	$656	
Long-term debt/Assets (winsorized)	*N*	243	120	363	
	Mean	0.536	0.766	0.612	***
	Median	0.499	0.748	0.579	
Long-term debt/EBITDA>10	*N*	375	248	621	
	Mean	0.583	0.671	0.618	**
	Median	1	1	1	
Long-term debt/EBITDA>5	*N*	375	248	621	
	Mean	0.82	0.916	0.858	***
	Median	1	1	1	
Long-term debt/Sales (winsorized)	*N*	267	154	421	

	Mean	0.876	0.892	0.882	***
	Median	0.506	0.749	0.592	
Months since last loan financing	*N*	352	232	584	
	Mean	26.7	28.8	27.5	***
	Median	21.2	24.1	22.4	
Dividend recap within 5 yrs of default?	*N*	375	248	621	
	Mean	0.016	0.072	0.039	***
	Median	0	0	0	
Any recapitalization within 5 yrs of default?	*N*	375	248	621	
	Mean	0.062	0.145	0.095	***
	Median	0	0	0	

B: Industry and macro variables

		Non PE-backed at default	PE-backed at default	Total	
Industry sales growth, year of default	*N*	369	248	617	
	Mean	0.032	0.019	0.026	**
	Median	0.044	0.032	0.037	
Industry EBITDA/Sales, year of default	*N*	369	248	617	
	Mean	0.112	0.100	0.107	
	Median	0.095	0.093	0.093	
Change in industry EBITDA/Sales, year of default	*N*	369	248	617	
	Mean	-0.001	-0.002	-0.002	
	Median	-0.001	-0.001	-0.001	
GDP growth (%), year of default	*N*	369	248	617	
	Mean	1.463	0.724	1.166	***
	Median	1.827	1.093	1.827	
Market credit spread (%), year of default	*N*	366	238	604	
	Mean	1.225	1.375	1.284	**
	Median	1.11	1.11	1.11	
S&P500 return (%), year of default	*N*	372	249	621	
	Mean	3.49	2.85	3.234	
	Median	5.49	10.88	5.49	

C: Bankruptcy characteristics

		Non PE-backed at default	PE-backed at default	Total	
Total assets at bankruptcy filing ($ in millions)	*N*	197	131	328	
	Mean	$2,789	$776	$1,984	***
	Median	620.8	297.4	436.822	

Total liabilities at filing	*N*	197	132	329	
	Mean	$3,189	$906	$2,273	***
	Median	$632	$455	$512	
Liabilities/Assets at filing (winsorized)	*N*	196	131	327	
	Mean	1.605	2.049	1.783	***
	Median	1.001	1.281	1.088	
Delaware filing	*N*	263	175	438	
	Mean	0.376	0.566	0.452	***
	Median	0	1	0	

D: PE fund characteristics (PE-backed only)

Months since buyout	*N*	247
	Mean	56.5
	Median	47.5
Years since last BO fund raised	*N*	157
	Mean	3.2
	Median	2.9
Last BO fund raised more than 5 yrs	*N*	249
Before default	*Mean*	0.213
	Median	0
Ln total funds raised	*N*	216
	Mean	7.619
	Median	7.65
Debt / PE fund size	*N*	136
	Mean	0.47
	Median	0.19
Ln PE age	*N*	222
	Mean	2.51
	Median	2.639

Table 5: Restructuring types, outcomes, and recovery rates

Default types and outcomes for a sample of 623 U.S. companies that defaulted on their debt between 1997 and 2011. The sample includes 248 companies that were controlled by private equity funds at the time of default (PE-backed) and 375 companies that were not (non-PE-backed). Pre-negotiated banrkrupticies include both "pre-packaged" Ch. 11 filings (company files with a plan of reorganization in place and adequate creditor votes to approve the plan) and "pre-arranged" Ch. 11 filings (company files with a plan of reorganization in place but with an inadequate number of creditor votes to approve the plan). 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.

A: Restructuring type

		Chapter 11 (excluding pre-packed)	Pre-negotiated bankruptcy	Distressed change	Other out-of-court	Total
Whole sample	N	360	118	94	51	623
	% of defaults	58%	19%	15%	8%	
PE-backed	N	119	60	44	26	248
	% of defaults	48%	24%	18%	10%	
Non-PE-backed	N	241	58	50	25	375
	% of defaults	64%	16%	13%	7%	

Table 5 (continued)

B: Number of months in default

	Time period	Mean	Median		N
Whole sample	1997-2006	16.9	13.1		374
	2007-2009	8.8	7.7		193
	2010-2011	3.7	3.3		15
	1997-2011	13.9	10.4		581
PE-backed	1997-2006	12.0	9.6	***	132
	2007-2009	7.8	6.2	*	96
	2010-2011	2.7	1.9		9
	1997-2010	9.9	7.7	***	237
Non-PE-backed	1997-2006	19.6	14.2	***	242
	2007-2009	9.8	9.0	*	97
	2009-2010	5.3	4.1		6
	1997-2010	16.6	12.1	***	345

C: Restructuring outcome

		Reorganized	Sale to non-strategic buyer	Acquired by strategic buyer	Liquidated	Ongoing
Whole sample	N	430	36	76	79	2
	% of defaults	69%	6%	12%	13%	0%
PE-backed	N	184	14	29	22	0
	% of defaults	74%	6%	12%	9%	0%
Non-PE-backed	N	246	22	47	57	2
	% of defaults	66%	6%	13%	15%	1%

Table 5 (continued)

D: Controlling finacial owners in Ch. 1l bankruptcy exits

		Creditors of unknown identity	Bank lenders	Hedge fund	Original PE investor	Original non-PE shareholders	New PE investor	Manage-ment	Total
Whole sample	N	100	53	30	23	6	49	1	262
	% of bankruptcies	38%	20%	11%	9%	2%	19%	0%	100%
PE-backed	N	42	29	10	23	0	21	0	125
	% of bankruptcies	34%	23%	8%	18%	0%	17%	0%	100%
Non-PE-backed	N	58	24	20	0	6	28	1	137
	% of bankruptcies	42%	18%	15%	0%	4%	20%	1%	100%

Table 5 (continued)

E: Creditor recovery rates

	Overall			Bank			Bonds			
	N	Mean	Median	N	Mean	Median	N	Mean	Median	
Whole sample										
Reorganized	183	0.56	0.57	175	0.87	1.00	175	0.38	0.29	
Acquired by financial buyer	10	0.34	0.30	10	0.56	0.59	9	0.12	0.01	
Acquired by strategic buyer	42	0.50	0.53	40	0.83	1.00	41	0.26	0.18	
Liquidated	22	0.35	0.29	19	0.74	1.00	20	0.10	0.05	
Total	257	0.52	0.52	244	0.84	1.00	245	0.33	0.22	
PE-backed										
Reorganized	71	0.54	0.50	68	0.84	1.00	66	0.32	0.28	
Acquired by financial buyer	4	0.26	0.19	4	0.57	0.55	4	0.03	0.01	
Acquired by strategic buyer	15	0.53	0.57	15	0.87	1.00	14	0.25	0.15	
Liquidated	9	0.35	0.28	9	0.52	0.46	8	0.11	0.01	
Total	99	0.51	0.47	96	0.80	1.00	92	0.28	0.21	
Non-PE-backed										
Reorganized	112	0.58	0.59	107	0.90	1.00	109	0.42	0.35	
Acquired by financial buyer	6	0.39	0.39	6	0.56	0.59	5	0.20	0.15	
Acquired by strategic buyer	27	0.48	0.51	25	0.81	1.00	27	0.27	0.18	
Liquidated	13	0.35	0.33	10	0.95	1.00	12	0.10	0.07	
Total	158	0.53	0.53	148	0.87	1.00	153	0.36	0.24	
Diff. PE vs non-PE										
Reorganized		-0.04	-0.09		-0.06	0.00		-0.10	-0.07	*
Acquired by financial buyer		-0.13	-0.20		0.01	-0.03		-0.17	-0.14	
Acquired by strategic buyer		0.05	0.06		0.06	0.00		-0.02	-0.03	
Liquidated		-0.02	-0.05		-0.43	-0.66	***	0.01	-0.06	**
Total		-0.06	-0.06		-0.07	0.00	**	-0.08	-0.03	**

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 for a sample of 617 U.S. companies that defaulted on their debt between 1997 and 2010. "Industry economically distressed" is a dummy variable taking the value of one if both the industry median operating profit and sales growth were negative during the year of default. "Firm economically distressed" is a dummy variable taking the value of one if both the firm's EBITDA and sales growth were negative for the last financial statement before default. Industry fixed effects are at the Fama-French 49 industry level, with industries with fewer than 10 observations have been consolidated into coarser industries (FF30 or 18). 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)	(2)	(3)	(4)
PE controlled at default	-0.045**	-0.053**	-0.211***	-0.177**
	-2.424	-2.475	-3.768	-1.976
Publicly traded	-0.018	-0.029	-0.044	-0.014
	-0.343	-0.542	-0.820	-0.236
Public debt outstanding	-0.056*	-0.059**	-0.058*	-0.046
	-1.852	-1.994	-1.777	-0.732
Industry economically distressed year of default	-0.009	-0.041	-0.037	-0.074
	-0.197	-0.627	-0.597	-0.947
Log sales (0 if no fin info)	0.030**	0.027**	0.027**	0.014
	2.102	2.050	1.969	1.195
No sales data dummy	0.198***	0.187***	0.114	
	3.024	2.604	1.541	
Firm economically distressed at last financials	0.011	0.030	0.018	0.020
	0.188	0.475	0.256	0.279
No firm profit data dummy	-0.017	-0.010	-0.016	0.059
	-0.405	-0.139	-0.265	0.447
Debt / assets at last financials	-0.118**	-0.085	-0.123**	-0.180***
	-2.165	-1.359	-1.993	-2.896
No firm leverage data dummy	-0.022	-0.008	-0.161**	0.051
	-0.272	-0.102	-2.321	0.536
Months since PE acquired (0 if non-PE)			0.002***	0.002**
			5.360	2.002
Debt at last financials / PE funds size (0 if non-PE)			0.093	
			1.478	
No Debt / PE size info			0.215***	
			3.119	
PE sponsor older than 10 years (0 if non-PE)			0.018	
			0.332	
Any recapitalization within 3 years of default				0.052
				0.324
Dividend recapitalization within 3 years of default				-0.020
				-0.146
Infusion of equity before default				-0.019
				-0.444
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	No	Yes	Yes	Yes
Pseudo-R2	0,101	0,135	0,171	0,211
Observations	617	617	592	284

Table 7: 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 617 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.

	(1)	(2)	(3)	(4)	(5)
			Ch. 11 only	Ch. 11 only	Ch. 11 only
VARIABLES	Tobit	Tobit	OLS	OLS	OLS
PE controlled at default	-4.344***	-3.998***	-3.449**	-6.305***	-3.164**
	-3.820	-4.183	-2.846	-4.963	-2.637
Publicly traded at last fin bef default	-1.643*	-2.221**	-1.465	-0.997	-1.725
	-1.758	-2.451	-1.108	-0.684	-1.264
Public debt outstanding	-0.783	-0.813	-0.189	1.328	-0.069
	-0.531	-0.523	-0.086	0.676	-0.032
Industry economically distressed	0.714	-0.480	0.272	-1.518	-0.248
	0.383	-0.291	0.133	-1.057	-0.132
Log sales (0 if no fin info)	1.412***	1.410***	1.191**	1.231**	1.171**
	3.627	4.593	2.692	2.748	2.690
No sales data	8.962**	8.425**	6.357	5.328	6.084
	2.102	2.170	1.512	1.431	1.568
Firm econ distress at last financials	-0.559	-0.565	0.272	-0.700	0.686
	-0.215	-0.211	0.137	-0.426	0.358
No firm profit data	2.294	2.181	3.286	5.435**	2.576
	1.191	1.199	1.118	2.369	0.852
Debt / assets at last financials	-2.910	-2.551	-3.451	-4.414*	-0.964
	-1.364	-1.202	-1.447	-1.971	-0.440
No firm leverage info	-4.610*	-4.473*	-6.310**	-4.743	-4.623*
	-1.767	-1.747	-2.724	-1.237	-2.141
Months since PE acquired				0.022	
				1.496	
Debt at last financials / PE fund size				0.767	
				0.482	
No Debt / PE size info				-1.825	
				-0.536	
PE sponsor older than 10 years				0.489	
				0.370	
Delaware filing			-3.383*	-2.134	-2.657
			-1.942	-1.189	-1.581
S. Distr. of NY filing			3.045	3.749	3.753
			1.371	1.625	1.762
Pre-packaged bankruptcy					-5.892***
					-3.186
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	Yes	Yes	Yes	Yes
Observations	577	577	430	413	430
Pseudo/adj R2	0.025	0.03	0.207	0.215	0.229

Table 8: 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 617 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)
VARIABLES					Ch11 filings only
PE controlled at default	0.041	0.081***	0.107**	0.085*	0.090*
	1.281	3.172	2.108	1.756	1.718
Publicly traded at last fin bef default	0.025	0.027	0.033	0.026	-0.005
	0.557	0.661	0.808	0.625	-0.090
Public debt outstanding	0.032	0.071**	0.062**	0.073**	0.017
	0.989	2.125	2.086	2.145	0.381
Industry economically distressed	-0.101**	-0.116*	-0.100	-0.118*	-0.249***
	-2.122	-1.859	-1.476	-1.860	-3.208
Log sales (0 if no fin info)	0.006	0.012	0.014	0.012	0.033
	0.453	1.014	1.098	1.005	1.272
No sales data	0.012	0.042	0.071	0.042	0.212
	0.125	0.554	0.919	0.536	1.613
Firm economically distressed	-0.193***	-0.223***	-0.200***	-0.226***	-0.370***
	-2.925	-3.423	-3.249	-3.452	-4.203
No firm profit data	-0.119*	-0.137*	-0.152*	-0.138*	-0.262**
	-1.852	-1.816	-1.916	-1.764	-2.392
Debt / assets at last financials	0.279***	0.265***	0.273***	0.263***	0.407***
	5.838	4.809	5.067	4.705	3.708
No firm leverage info	0.206***	0.205***	0.249***	0.204***	0.262***
	4.649	4.173	4.786	4.096	2.835
Months since PE acquired (0 if non-PE)			-0.000	-0.000	
			-0.118	-0.090	
Debt at last financials / PE fund size			-0.105		
			-1.406		
No PE size info			-0.085		
			-1.528		
PE sponsor older than 10 years			-0.015		
			-0.228		
Dividend recap. within 3 yrs of default				0.057	
				0.513	
Delaware filing					0.046
					0.826
S. Distr. of NY filing					0.054
					0.372
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	Yes	Yes	Yes	Yes
Pseudo-R2	0,136				
Observations	617	617	592	615	434

Table 9: Determinants of creditor recovery rates in default

OLS regressions of bankruptcy recovery rates on PE-backing and other control variables for a sample of 203 U.S. companies that filed for Chapter 11 between 1997 and 2010. Recovery rates are discounted recovery rates from Moody's. Coefficients (standard errors clustered by default year) are statistically significant at the 10% (*), 5% (**), and 1% (***) levels.

VARIABLES	(1)	(2)	(3)	(4)	(5)
PE controlled at default	-0.025	-0.020	-0.015	0.069	-0.041
	-0.550	-0.459	-0.343	1.170	-0.561
Publicly traded at last fin bef default	-0.033	-0.036	-0.028	-0.048	-0.081*
	-1.149	-1.082	-0.832	-1.420	-1.934
Public debt outstanding	0.033	0.046	0.042	0.059	-0.031
	0.546	0.825	0.763	1.073	-0.301
Industry distress	-0.065**	-0.107***	-0.086***	-0.118***	-0.068
	-2.188	-3.326	-3.102	-4.560	-0.752
Log sales (0 if no fin info)	0.027*	0.028*	0.031*	0.029**	0.029
	2.061	1.911	2.163	2.502	0.946
No sales data	0.173	0.167	0.197*	0.116	
	1.543	1.519	1.787	1.123	
Firm econ distress at last financials	-0.013	-0.026	-0.025	0.004	-0.012
	-0.154	-0.246	-0.248	0.037	-0.088
No firm profit data	-0.034	-0.034	-0.019	-0.005	
	-0.330	-0.297	-0.167	-0.059	
Debt / assets at last financials	0.035	0.073	0.020	0.097	0.033
	0.430	1.006	0.295	1.271	0.374
No firm leverage info	0.028	0.070	0.020	0.055	0.075
	0.341	1.003	0.334	1.045	0.647
Months since PE acquired				-0.001	
				-1.267	
Debt at last financials / PE fund size				-0.117	
				-1.166	
No Debt / PE size info				0.025	
				0.224	
PE sponsor older than 10 years				0.024	
				0.272	
Any recap within 3 years of default					-0.053
					-0.814
Dividend recap within 3 years of default					0.672***
					3.153
Infusion of equity before default					0.007
					0.155
Pre-packaged bankruptcy			0.121**		
			2.926		
Delaware filing	-0.085*	-0.089*	-0.102**	-0.099*	-0.058
	-1.795	-1.810	-2.220	-2.022	-0.892
S. Distr. of NY filing	-0.001	0.015	0.002	0.008	-0.076
	-0.028	0.277	0.036	0.140	-1.082
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	Yes	Yes	Yes	Yes
Observations	203	202	202	197	125
Adjusted R-squared	0.127	0.113	0.147	0.114	0.155