Excessive Continuation and the Cost of Flexibility in Financial Distress*

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ABSTRACT

Using a sample of distressed firms worth more dead than alive, we find that most of them continue operations long after the optimal exit time. For the median firm, the failure to exit in a timely manner costs 8.7% in assets over three years. Excessive continuations are financed by reductions in working capital, and are facilitated by low current debt payments, high proportions of public bonds, and the absence of covenants prohibiting asset sales. Unlike bank covenants, bond covenants reduce wasteful continuations, but for many inefficient firms they may not be set tightly enough.

Keywords: Financial distress; Bankruptcy; Liquidation; Agency costs; Exit

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Introduction

Do failing businesses continue operations for too long? As demand falls and the firm's competitive advantage is eroded, there comes a time when the ailing firm should be optimally closed down and its capital released for alternative uses. Yet managers may be reluctant to disinvest and liquidate the firm if doing so is likely to result in the loss of perks and possibly their job. In many financially distressed firms, shareholders may also resist restructuring, as even a remote chance of recovery under the status quo is often better for them than bankruptcy. The failure of an unprofitable firm to reorganize in a timely manner hurts its creditors by reducing expected recovery rates, which may result in higher borrowing costs ex ante. Excessive continuation induces a wealth transfer from creditors to managers and shareholders, and provides is a stark example of the overinvestment (asset substitution) problem, which Jensen and Meckling (1976) identify as a potentially important agency cost of debt.[1] In this paper, we quantify the cost of the failure to exit in a timely manner, and find it to be an important contributor to total costs of financial distress.

We identify firms whose assets should be optimally released to alternative uses as those whose q ratio, conservatively estimated based on market prices of debt and equity, falls below one. Tobin's q is defined as the ratio of the market value of the firm's assets to their replacement costs, and summarizes the market's view of the firm's ability to create value for investors. The numerator of Tobin's q is the market value of the firm's assets under the "status quo" of being operated within the firm. Crucial to our estimation of the value of assets is the use of market prices of debt, which for highly-levered distressed firms typically is by far the largest claim on the assets, yet traded at deep discounts relative to book values. The denominator of the q ratio is the replacement cost of assets, defined as "the dollar outlay needed to purchase the current productive capacity of the firm at minimum cost and with the most modern technologies available" (Lindenberg and Ross (1981)). Thus, the replacement cost provides the lower limit on the price that outsiders should be expected to pay to acquire the firm's physical assets. When this price exceeds the market value of the firm

[1] The term "asset substitution" is often used to refer to the wealth transfer from creditors to equityholders induced by increases in the volatility of the firm's cash flows. While harmful to creditors, such risk shifting does not necessarily adversely affect the firm as a whole. More generally, asset substitution may involve adoption of value-destroying projects if they result in a similar wealth transfer. Operating the firm whose assets are more valuable in other uses is an example of such negative-value investment.

under the status quo, the firm's investors would be better off if the firm sold its assets to alternative users for their replacement costs. As Lewellen and Badrinath (1997) point out, "unless assets are used by a firm so as to create at least as much market value as the cost of reproducing them, the assets would be better employed elsewhere."

Based on this idea, we identify 371 highly-levered firms whose q ratio at some point falls below one,[2] under the expectation that these firms should optimally be shut down and their assets sold to competitors. These firms can transfer assets to alternative users either through an acquisition, or by filing for bankruptcy.[3] We find that three years after their q falls below one, 5.4% of the firms have been acquired, 20% have defaulted, another 21% are still in distress with q below one, and the remaining 54% have "recovered" in the sense that their q has risen above one. However, 25% of recovered firms become seriously distressed again within 18 months after recovery, indicating persistent problems. Thus, our evidence suggests that a large fraction of distressed firms continue inefficiently for many years. Even for q ratios substantially below 1, the proportion of continuations remains very high. For instance, among firms whose q falls below 0.8 (which corresponds to average market-to-book asset ratios as low as 51%), 47% neither file for bankruptcy nor are acquired within three years.

The failure of sample firms to exit results in a substantial destruction of value. We find that 80% of our sample firms underperform the industry median over the next three years. This underperformance is economically significant: The mean cumulative return on assets over three years for sample firms is –9.4%, compared with 7.4% for other firms in the industry. For the median firm in the sample, the difference in the cumulative return on assets over three years is –8.7%. These estimates quantify the cost of this type of asset substitution behavior. They amount to a substantial fraction of the total cost of financial distress (Andrade and Kaplan (1998); Davydenko, Strebulaev, and Zhao (2011)). For comparison, direct costs of bankruptcy are generally below 6% of assets (Warner (1977); Weiss (1990); Altman (1984); LoPucki and Doherty (2004)).

[2]To be conservative, we understate the case for reorganization even more by looking only at the replacement costs of firms' *tangible* assets, such as fixed and current assets, and excluding other assets such as goodwill, whose value for distressed firms may be difficult to ascertain. By doing so we bias ourselves against finding excessive continuations.

[3]Recent studies show that Chapter 11 of the U.S. Bankruptcy Code over the past decade has evolved into a mechanism for a quick sale of the firm's assets and the release of the capital for a better use (Baird and Rassmunsen (2003), Bris, Welch, and Zhu (2006), and Capkun and Weiss (2007)).

We also find that sample firms finance their money-losing operations at least partially by asset sales. By the time firms exits the distressed sample, their tangible assets, measured at replacement cost, are reduced on average by 9.3%. As sales of fixed assets by distressed firms outside of bankruptcy can often be challenged by creditors, these asset reductions come primarily from contractions in working capital. Such behavior reduces expected recovery rates for creditors, and may increase the cost of debt ex ante. A detailed study of the determinants of exit reveals that excessive continuations are facilitated by high asset liquidity, low current debt service, and a high proportion of public bonds in the capital structure. We find no evidence that managerial shareholding affects the probability of exit.

We also study the role of covenants in mitigating excessive continuations. We construct a database of various bond and loan covenants, and relate them to the probability of exit through bankruptcy or acquisition. We find that the only loan covenant that significantly increases the probability of exit is that restricting asset sales. This is consistent with the hypothesis that banks are willing to waive technical defaults, but do not allow borrowing firms to erode their collateral through assets sales. In contrast to loans, several types of bond covenants reduce the ability of the firm to continue past the optimal liquidation point. Of note, the presence of restrictions on leverage or net worth in bond indentures is positively associated with bankruptcy. At the same time, we find that these covenants may not be set tightly enough: While 77.3% of sample firms have such covenants, only 42.9% of those firms file for bankruptcy. With hindsight, for many of these firms the flexibility afforded by lax covenants appears to backfire for bondholders, as they have little power to force a timely reorganization and prevent the firm from destroying value in unprofitable operations.

To our knowledge, our paper is the first to systematically investigate the extent and the cost of the failure of inefficient firms to exit in a timely manner. Jensen (1993) argues that historically, firms' internal control systems have failed to bring about timely exit and downsizing. Grinblatt and Titman (1998) note that the exit decision is one of the most difficult decisions a firm must make, and that excessive continuations are likely in the presence of debt. Lambrecht and Myers (2007) model managers' incentives to exit, and find that when managers can appropriate cash flow and

investor intervention is costly, the firm is shut down too late. Décamps and Faure-Grimaud (2002) use a contingent-claim model to show that in the presence of debt, equityholders' exit decisions involve excessive continuation that reduces firm value. Davydenko (2010) documents that many highly levered firms that appear very distressed are able to avoid default and bankruptcy for years, but he does not investigate whether such delays are costly. Davydenko, Strebulaev, and Zhao (2011) and Taillard (2011) find that default and bankruptcy often result in an increase in firm value, suggesting that investors prefer them over the status quo of continued operations. Studies of bankruptcy filings convey a sense that most firms file "too late" (Jackson (1986)), but there is little systematic evidence of this effect in the literature. One exception is provided by Andrade and Kaplan (1998), who find that distressed highly-levered firms tend to delay restructuring or filing for bankruptcy "in a way that appears to be costly". Our paper quantifies the extent and the costs of such delays, and studies the role of various firm characteristics in facilitating exit for inefficient firms.

The remainder of the paper is organized as follows. Section I discusses related literature and our empirical hypotheses. Section II describes our data. Section III documents the ability of distressed firms to avoid or delay liquidation, and shows that excessive continuations are costly. Section IV uses regression analysis to determine firm characteristics that allow firms to avoid exit. Section V studies the role of covenants, and Section VI concludes.

I. Related Literature and Hypothesis Development

A. The exit decision

The exit of unprofitable firms is an integral part of the Schumpeterian "creative destruction" (Schumpeter (1942)). Jensen (1993) reviews changes in the worldwide economy between 1973 and 1993, and argues that, as the corporate landscape changed, corporate internal control systems failed to deal effectively with the requirement to exit. Theoretically, the decision to exit has been modeled within the real-option framework. Lambrecht and Myers (2007) present a model or takeovers and disinvestment in which managers can appropriate cash flows and investors' intervention is costly.

They show that managers of unlevered firms always liquidate too late even in the presence of golden parachutes, although the latter partially restore efficiency. They also find that the presence of debt mitigates the excessive continuation problem, essentially because it reduces the free cash flow that managers can expropriate (Jensen (1986)).[4]

A number of models of the exit decision of levered firms are found in contingent claims models of corporate debt. Using a continuous-time model, Décamps and Faure-Grimaud (2002) show that the option of keeping the firm alive is valued differently by equity- and debtholders, giving rise to inefficient continuations. As a result, equityholders may prefer excessive continuation even when liquidation proceeds are large enough for equity to receive a positive distribution. Mella-Barral (1999) shows that excessive continuation is likely when the ongoing debt service is low. By contrast, when the debt coupon is too high, the firm is liquidated too early, as equityholders become unwilling to keep their option alive by servicing the debt. Morellec (2001) studies how covenants and asset liquidity affect the liquidation and downsizing decision of levered firms.

On the empirical side, we know of no systematic study of the optimality of exit decisions for distressed firms.[5] DeAngelo, DeAngelo and Wruck (2002) provide a case study of L.A. Gear, a firm which, having been a top performer in the late 1980s, later experienced a sharp decline, but was able to continue money-losing operations for many years due to its liquid asset structure, long debt maturity, low ongoing debt payments, and the lack of restrictive bond covenants. The L.A. Gear case illustrates that manager of distressed firms may have significant discretion over the timing of reorganization, and the role of the creditors may in some cases be reduced to that of spectators witnessing the destruction of their value in unprofitable going concern operations. Consistent with this observation, Davydenko (2010) finds that a large proportion of firms that are so distressed that they appear below their theory-predicted "default boundary" in practice are able to avoid default or delay it for many years. Unlike our paper, these studies do not explicitly address the question of whether delays in the exit decision appeared suboptimal at the time without the benefit of hindsight.

[4]Vaysman (2006) studies compensation contracts that address managerial incentives related to investment and abandonment under asymmetric information.

[5]Sizeable literature studies empirical predictors of bankruptcy and mergers and acquisitions (see, for example, reviews by Siegfried and Evans (1994) and Caves (1998)). These studies, however, do not investigate whether the timing of reorganizations is optimal, and whether suboptimal continuations are typical for levered firms.

Our starting point is the recognition that when Tobin's q is below one, it is optimal to redeploy the assets elsewhere. We focus on two major means of reorganization involving a transfer of asset ownership to alternative users, namely, merger (or acquisition) and bankruptcy. We summarize the above discussion in the following hypothesis.

HYPOTHESIS 1. *Despite their q falling below one, highly-levered firms have incentives to delay reorganization or try to avoid it for extended periods of time. On average, these firms underperform relative to their industry peers after their q falls below one.*

Previous research argues that the ability of a firm to delay exit in distress should depend on asset liquidity, tangibility, and debt structure (Morellec (2001) and DeAngelo, DeAngelo and Wruck (2002)). In addition, we hypothesize that Tobin's q should also be a predictor of which firms are reorganized. Indeed, our sample consists entirely of firms with q ratio below one, which indicates that the market's estimate of the value on the firm's assets under the status quo is lower than the costs of the firm's productive capacity. Generally, low values of Tobin's q indicate market scepticism regarding the prospect of the firm under the current management, and therefore the probability of reorganization should be higher for low-q firms. This is consistent with the q-theory of mergers by Jovanovic and Rousseau (2002) and evidence in Servaes (1991), who studies a sample of mergers and acquisitions, and finds that typically low-q firms are acquired by high-q firms.

Managerial entrenchment and equity holding may also be an important determinant of the timing of reorganization. High equity ownership by managers may increase the likelihood in excessive continuation, since shareholders are likely to incur large losses in bankruptcy. But even managers who do not act to maximize the value of equity may prefer the status quo due to potential loss of managerial perks. Indeed, pre-distress managers are often replaced in distressed reorganizations (Gilson (1989, 1990). Shleifer and Vishny (1989) state that: "by making manager-specific investments, managers can reduce the probability of being replaced, extract higher wages and larger perquisites from shareholders, and obtain more latitude in determining corporate strategy." Hotchkiss (1995) shows that continued involvement of pre-bankruptcy management in the restructuring process is strongly associated with poor post-bankruptcy performance. Reorganization may expose managerial incompetence, so that managers may prefer waiting out and hoping for better

luck. Thus, entrenched entrenched managers that have more to lose may have a stronger incentive to avoid liquidation.

HYPOTHESIS 2. *Firms with high asset liquidity, low current debt payments, long debt maturities, and high degree of managerial entrenchment wait longer before reorganizing. Furthermore, the probability of exit is negatively correlated with q.*

B. The role of banks and debt covenants

We also study the role of banks and debt contract design in curbing the firm's ability to continue operations opportunistically when liquidation is the optimal outcome. Why do creditors fail to force reorganization when continuation results in value destruction for creditors. Does the lack of protective covenants exacerbate the problem?

Public bondholders may be unable to force reorganization because of coordination problems and the lack of covenants which, when violated, would allow them to trigger bankruptcy. Bulow and Shoven (1978) and Gertner and Scharfstein (1991) argue that public bondholders lack coordination and are subject to the hold-out problem. Moreover, unless the firm misses a bond payment or violates a bond covenant, creditors cannot force the firm into bankruptcy. Yet public bonds come with relatively few covenants compared with bank debt (Bradley and Roberts (2004)). The case study of L.A.Gear (DeAngelo, DeAngelo and Wruck (2002)) provides an example of a firm that replaced its bank debt, whose covenants it constantly violated, with covenant-free public bonds, and thus was able to continue money-losing operations for six years before it eventually collapsed. Sweeney (1994) and DeAngelo, DeAngelo, and Skinner (1994) find that a large majority of technical defaults (covenant violations) involve private debt rather than public bonds.

Jensen and Meckling (1976) and Smith and Warner (1979) point out that debt covenants can curb borrowing firm's opportunism and reduce agency costs of debt. Smith (1993) argues that banks' "dynamic flexible monitoring" involves setting covenant tightly enough to ensure an on-going ability to quickly lower their risk exposure should a troubled borrowers financial position deteriorates. Indeed, bank covenants are violated for about one-quarter to one-third of all loans, and most of these violations do not indicate distress (Dichev and Skinner (2002); Chava and

Roberts (2008)). These covenant violations typically result in renegotiation of bank debt rather than bankruptcy (Beneish and Press (1995)). Unlike public bondholders, who may have incentives but not the ability to liquidate the struggling firm to preserve value, banks may have the ability but no incentives to force bankruptcy, as they benefit from the ongoing relationship, but are less concerned about possible losses due to their superior monitoring abilities and senior status. Indeed, banks are most often paid in full in bankruptcy (Bris, Welch, and Zhu (2006)), and their recovery rates are significantly higher than those of public bondholders (Acharya, Bharath, and Srinivasan (2007)). Welch (1997) argues that "in the typical situation in large U.S. bankruptcies, the senior creditors are so deep-in-the-money that they would get fully satisfied even if liquidation drags on for years." Moreover, banks may be able to limit their risk further by reducing their exposure to the troubled firm, and by constraining the firm's managers. Stulz (1990) and Berger, Ofek and Yermack (1997) argue that managers will try to to avoid this constraint altogether by replacing bank debt with less restrictive public debt, as the case of L.A.Gear illustrates (DeAngelo, DeAngelo and Wruck (2002)). We summarize this discussion in the following hypothesis.

HYPOTHESIS 3. *The probability of exit for inefficient distressed firms is positively correlated with the presence of bond covenants, but less so with the presence of loan covenants.*

II. Data Description

Our study focuses on highly-levered firms whose market value is below the value of their assets in the best alternative use, implying that it is socially optimal to cease operations and sell the assets. The value of the firm's assets under the status quo (i.e., operated within the firm) is the total market value of all financial claims on the firm's cash flows, such as equity and debt. We proxy for the minimum value of assets in liquidation by the replacement costs of the firm's assets. The replacement cost is defined as the investment outlay required to replicate the firm's productive ability at minimum cost and using the latest technology available. Thus, we assume that the firm should optimally be liquidated when the Tobin's q falls below the threshold value of one. To the extent that replacement costs provide only the lower bound of the value of the firm's assets to outsiders, this assumption is conservative in identifying firms that are worth more dead than alive.

Motivated by this argument, we select our study sample from a data set of speculative-grade firms for which we observe market values of debt and equity and can estimate the replacement cost of assets. In estimating Tobin's q, the market value of debt is typically approximated by its book value, or by using some variant of the algorithm suggested by Brainard, Shoven, and Weiss (1980) (e.g., Lewellen and Badrinath (1997)). However, the potential accuracy of this approximation for highly-levered firms in distress is questionable. For this reason, we use as a starting point the set of firms included in the Merrill Lynch High Yield Master Index II (MLI), for which we have monthly observations of market prices of public bonds between December 1996 and March 2004.[6] We manually merge MLI data with Compustat, CRSP, the Fixed Income Securities Database (FISD), and Loan Pricing Corporation's DealScan, taking account of mergers, name changes, and parent-subsidiary relationships. We use quarterly Compustat, available through December 2005, for financial information and for market equity prices of delisted firms. We use FISD as a source of information on corporate bonds, including coupons, maturity, covenants, and the history of outstanding amounts. Information on bank loans, including maturity, coupon structure, yield spread, and covenants, is taken from DealScan. We use ExecComp for managerial characteristics and compensation structure. Information on bankruptcy filings is extracted from the May 2006 issue of the Default Research Services (DRS) database provided by Moody's Investor Services. Information on mergers and acquisitions is from the SDC database. Finally, details of the firm's debt structure, used to study the evolution of bank debt as well as to improve the accuracy of the estimates of the market value of debt, is manually collected from the firms' 10-K filings and from the long-term debt section of Mergent Manuals.

From the list of MLI constituents, we exclude all firms other than industrial U.S. firms. We estimate Tobin's q using the following procedure. First, the market value of the firm's assets is estimated as a sum of the market values of equity (taken from CRSP or, when missing, from Compustat) and debt. The market value of public debt is estimated using monthly prices from Merrill Lynch. Bonds that are not included in the MLI (these are bonds with par value less than \$100 million, as well as with remaining maturity below one year) are valued assuming that their yield equals the weighted-average yield for the firm's bonds that are included in the MLI for

[6] See Schaefer and Strebulaev (2008) for a detailed description of the Merrill Lynch data in.

that month. To estimate the market value of bank debt, we first construct promised loan cash flows using information on coupons and maturity of the firm's most recent loan in the DealScan database.[7] We discount these cash flows assuming that the applicable discount rate equals the median contemporary yield for all new loans with the same rating in Dealscan. Finally, we assume that all debt other than bonds and loans, such as mortgages and capitalized lease obligations, has the same ratio of market to par value as bank loans. Hence, the procedure essentially classifies all of the firm's debt into two categories, bonds and institutional debt, with different market discounts relative to par. To improve accuracy, we manually collect data on the composition of long-term debt from firms' 10-K filings and hard copies of Mergent manuals for half of the firms with the highest difference between the market discounts for bonds and loans. For other firms, for which the precise split between bonds and other debt is not crucial, we infer that split by aggregating the history of outstanding bond amounts, reported in FISD for the firm and its wholly owned subsidiaries.[8] The sum up the market values of equity, bonds, and other debt is our estimate of the market value of the firm, or the numerator of Tobin's q.

The denominator of Tobin's q is estimated as the book value of current assets other than inventories, plus the replacement costs of fixed assets and inventories, calculated using the Lee-Tompkins (1999) modification of the Lewellen-Badrinath (1997) algorithm. Hence, unlike other studies that use Tobin's q (e.g., Lindenberg and Ross (1981)), we do not include the book value of *all* assets other than fixed assets and inventories. By focusing on tangible assets and ignoring other components of total assets, such as goodwill and intangibles, we may underestimate the replacement cost of assets and overestimate Tobin's q. We do this in order to be conservative, as the value of such assets in distress for potential buyers may be difficult to ascertain. As a result, we may bias ourselves against finding excessive continuations.

Our final study sample consists of 371 firms for which q falls below one for at least three months in a row between December 1996 and March 2004. We study subsequent reorganizations of these firms by means of bankruptcy or merger. Information on bankruptcy filings is extracted from the

[7] More precisely, we use DealScan information on the initial yield spread over LIBOR, and assume that this spread remains constant over the life of the bond.

[8] This procedure generally results in a reasonable approximation of the ratio of bonds to other debt. The median ratio of FISD-predicted amount of bonds to that reported in 10-K filings equals one.

Default Research Services (DRS), distributed by Moody's. We also query the SDC data base to find all mergers and acquisitions targeting our firms, where the resulting equity ownership by the acquiror exceeds 50%.

III. Excessive Continuations and Value Destruction

A. The incidence and types of exit

After a firm's q ratio falls below one, it can exit our sample by either filing for bankruptcy, being acquired (when the acquiror gains majority equity ownership), or "recovering", whereby the firm's q rises above one for at least three months in a row. For our purposes, this recovery is a form of exit, in the sense that the firm no longer should be liquidated according to our sample selection criterium.

Several comments are in order. First, we study the determinants of the decision to exit through bankruptcy or acquisition, but not through recovery, essentially treating recovery as an exogenous random event.[9] By contrast, managers can decide to exit through bankruptcy at any time. Second, while we treat continuations of firms that (randomly) recovered ex post as no longer wasteful once their q rises above one, their failure to exit prior to that point is still classified as a suboptimal continuation decision. Third, even though we consider recovered firms as no longer being under the threat of liquidation, and exclude them from our analysis of factors that predict exit (see Sections IV and V), we do continue to include them in calculations of various statistics over time (see Subsection III.C). For example, to estimate the average return on assets for our sample firms three years after they enter the sample, we look at all firms that survive until that time, regardless of whether they have recovered or are still distressed. Finally, it should be noted that, since our estimates of the replacement costs of assets are conservative, some of these "recovered" firms may still be worth more dead than alive. In practice, however, we find that few firms file for bankruptcy

[9]While recovery can be a consequence of managers' actions aimed at rectifying distress, we do not observe such actions, nor is it our purpose to explain which actions result in recovery. Because the expected value added by such actions is incorporated in the market value of the firm, which comprises the numerator of Tobin's q, our sample selection criterium implies that the market is sceptical about the ability of the current management to turn around the firm.

when their q is above one.

Figure 1 illustrates the dynamics of exit for our firms after they enter the sample. For the first event of distress that we observe in our sample, 8% of firms are acquired, 26% file for bankruptcy, 14% remain distressed for as long as data are available, and 52% recover. However, of the 194 firms that recover, 73 firms, or 38%, become distressed again during the sample period. This evidence is consistent with Hotchkiss (1995) and Gilson (1997), who find that recovering firms often continue to experience difficulties, and that many of them fail again within a short period of time. The distribution by exit type for the firms that become distressed for the second time is broadly similar, except that the proportion of "no exit" firms is higher due to shorter data histories. Overall, of the 371 sample firms that entered the sample, 112 firms (30%) eventually file for bankruptcy, 35 firms (9%) are acquired, and 151 firms (41%) recover. The average firm in our sample remain distressed for 25 months before exiting through bankruptcy, acquisition or recovery. In addition, as many as 73 firms, or 20% of the sample, still have q below one at the latest available observation date, having spend on average 59 months in distress.

INSERT FIGURE 1 HERE

Thus, bankruptcy (distress duration of 22 months) is a much more common means of exit for these firms than acquisitions (distress duration of 25 months). In fact, potential aquirors of assets may insist that the firm first file for bankruptcy, as otherwise the transaction may be declared void as fraudulent conveyance.[10] Interestingly, we do see acquisitions by outside parties after firms file for Chapter 11, as well as announcements of acquisitions by the firms' own creditors made prior to bankruptcy. Figure 2 shows the cumulative probability of bankruptcy and acquisition. As can be seen, the bankruptcy hazard decreases over time. This result is to be expected, as the most distressed firms exit the sample quickly, and the longer the firm remains in the distressed sample, the lower is the marginal probability of reorganization. However, as reported in Section IV, this dependence on time disappears once we control for firm characteristics. Overall, three years after their q falls below one, 5.4% of firms have been acquired, 20% have defaulted, another 21% are

[10]Hotchkiss and Mooradian (1998) study acquisitions in Chapter 11 bankruptcy.

still in distress with q below one, and the remaining 54% have "recovered" in the sense that their q has risen above one. However, 25% of recovered firms become seriously distressed again within 18 months after recovery.

INSERT FIGURE 2 HERE

The fraction of non-exiting firms that we document is so high that it may suggest that, even conservatively estimated, the value of q below one may not be a good criterium in deciding when the firm should be liquidated. If, for example, exercising the option to exit involves costs, then the firms' optimal policy should account for these costs, so that liquidation as soon as q falls below one is no longer optimal. However, direct costs of bankruptcy are usually found to be below 3–6% or firm value, while merger costs are smaller still (Warner (1977); Weiss (1990); Altman (1984); LoPucki and Doherty (2004)).[11] Moreover, we find that lowering the threshold value of q below one does not affect our conclusions dramatically. For instance, of those firms whose q falls below 0.8, as many as 47% neither file for bankruptcy nor are acquired within three years. To illustrate the degree of distress that these firms are in, their median market-to-book asset ratio (where the numerator is calculating using market prices of debt and equity) is only 0.50. For comparison, the median market-to-book ratio for all quarterly Compustat observations between 1990 and 2010 correspond to firms is 1.37.

We regard our selection criterium for identifying inefficient firms as conservative. Nonetheless, a potential criticism of our methodology is that replacement costs of tangible assets may overestimate the value of assets in alternative uses. To address such concerns, below we show that, even though many of our firms "recover", the operating performance of the vast majority of them falls well short of industry benchmarks. In fact, most of our firms are money losers, and, even accounting for bankruptcy costs, it still appears beneficial to bankrupt all our sample firms indiscriminately as soon as their q falls below one.

[11] While indirect costs of financial distress are higher, our firms are already distressed, and are likely to experience the impact of distress on customers, employees and management despite the absence of bankruptcy. Notice also that the failure of the firm to exit in a timely manner is itself an economically significant component of the indirect costs of distress.

B. Descriptive statistics

Table I reports descriptive statistics for sample firms in the quarter when they enter our sample. Firms that recover and then become distressed again are included in this table twice. As all our sample firms have public bonds in their capital structure, it comes as no surprise that they are relatively large compared to their industry peers. The median book value of assets is $1.4 Billion, which is almost six times the size of the sample firms' median 3-digit industry counterpart ($318 Million). Firms that are subsequently acquired are somewhat smaller, and firms that recover somewhat larger, although the differences are not statistically significant. Comparing replacement costs with the book value of assets, we see that the former amount to about 83% of the latter at the time when firms enter the distressed sample. It is interesting to note that this ratio is somewhat higher for firms that are eventually acquired than for other firms in the sample. The mean market-to-book asset ratio is 67%. It is substantially below our contemporaneous estimate of Tobin's q (not shown), whose mean (median) is 85% (90%).[12] These differences suggest that our q ratios are indeed conservative.

INSERT TABLE I HERE

The productive capacity of the median firm' assets is considerably lower than that of its median 3-digit industry counterpart. The average asset turnover (Operating income/Total assets) in the sample is negative, and the median is 1.16%, compared with 3% for other firms in the industry. Operating performance is clearly related to the eventual outcome, so that the best performing firms recover and the worst performing firms go bankrupt. Our firms are highly indebted, with market leverage ratios of 60% or more. Overall, these statistics show that the firms in our sample are financially distressed, in addition to being operated inefficiently as indicated by their q ratios below one. Univariate comparisons suggest that there are systematic differences between firms that later recover, are acquired, or file for bankruptcy. In Section IV, we test whether such factors predict exit in multivariate regressions.

Table II documents changes in book and market values of total assets and their replacement

[12]The fact that the average q is substantially rather than slightly below one is explained by the presence of firms which do not cross the threshold value of one from the above, but are instead already distressed the first time we measure their q.

costs, total and bank debt, and debt and equity returns for sample firms from entry to exit. Note that unlike Table I, this table excludes firms for which the first measurement of q that we have is already below one, as well as firms that remain distressed at the end of the sample period. The table shows that, by the time a distressed firms exits the sample, it has liquidated on average 9.3% of its tangible assets (valued at their replacement cost). This reduction is the highest for firms that end up in bankruptcy, but it is also substantial (6.6%) for firms that eventually recover. This reduction in the "liquidation value" of assets is in the order of magnitude of direct costs of bankruptcy, and may be twice as high as the cost of a merger. A detailed look at the asset structure (not tabulated) reveals the asset base shrinks primarily due to the reduction in current assets. This evidence is consistent with DeAngelo, DeAngelo, and Skinner (1994), who find that "[m]anagers are liquidating working capital to conserve cash in response to an unanticipated decline in the demand." Given that sales of fixed assets by distressed companies may be challenged as fraudulent conveyance and also prohibited by covenants (see Section V), in the presence of frictions that preclude the firm from accessing outside financing, working capital reductions may be the only viable source of cash for many ailing firms.[13]

The reduction in tangible assets is likely to reduce the expected recovery rate for creditors if the firm does eventually default. Table II shows that the tangible assets as a proportion of outstanding debt are reduced on average by 11.81%. Such behavior can potentially increase the cost of debt ex ante. Interestingly, while the total debt of sample firms remains roughly constant between entry and exit, the proportion of bank debt drops by 12.41%, primarily due to significant contractions for firms that manage to recover. In Section V we show that, unlike bond covenants, loan covenants generally do not increase the probability of bankruptcy. Taken together, these results suggest that upon covenant violation banks may be more interested in reducing their exposure to the distressed firm's debt than in triggering its bankruptcy.

The remaining statistics in Table II show the changes in market asset values and returns. While on average for all firms the market value of assets rises by 11% by the time surviving firms recover, bankrupt firms lose almost 48% of their market value. We also find a negative cumulative

[13]L.A. Gear (DeAngelo, DeAngelo, and Wruck (2002)) provides an example of a firm whose continuing existence in deep distress was sustained for six years by reductions in its liquid inventory stock.

change in market assets for acquired firms, perhaps because acquirors prefer to wait before buying distressed firms. These statistics, however, should be interpreted with caution, as there are only 10 acquired firms in this table.[14] The table also suggests that unadjusted equity and bond returns are significantly negative in the sample. These results, however, are likely to be specific to the time period under observation, which coincided with the dot-com crash, low equity returns, and an increase in bankruptcy filings, in conjunction with the fact that our sample consists of speculative-grade bond issuers only.

INSERT TABLE II HERE

C. The costs of excessive continuations

Our conclusion that excessive continuations are widespread is based on the maintained assumption that the firm should be liquidated once its q falls below one. We now proceed to demonstrate that the failure of sample firms to transfer their assets to alternative users is indeed wasteful, by comparing their operating performance to that of their industry peers. Other firms in the same industry provide a natural benchmark for assessing the operating performance of our firms. Specifically, for each sample firm, the control sample consists of all firms in the same 3-digit SIC industry.(If there are fewer than three industry peers with q greater than one, we use 2-digit-SIC industries rather than 3-digit industries.) We then compare the performance of our firms with that of the median firm in their industry. We track asset returns, profit margins, and the stock of tangible assets of our firms for three years after they enter the data set. For firms that exit the sample through bankruptcy or acquisition, we calculate the cumulative change in each variable until the time of exit, and then fix them at that value. For recovering firms, we continue to track the operating performance after their q rises above one.

Table III reports the results of these comparisons. It shows that distressed firms consistently underperform other firms in the industry, and the differences in asset returns and profit margins are statistically significant. Moreover, on entering the sample, the average firms can expect to lose

[14]For a firm to be included in this table, it must satisfy the following conditions: (1) Its q must be above 1 initially, falling below 1 on a date which we can identify unambiguously (in other words, we exclude firms for which we do not observe q crossing the threshold); and (2) We also must observe the market value of assets at the time of exit.

over the next three years 9.4% of its value in unprofitable operations, compared to the return on assets of industry peers of 7.4% over the same period. Assuming that the assets of our sample firms could produce a similar return of assets if sold to the competitors, these estimates suggest that, by not exiting, the firms lose as much as 16.8% of the book value of assets. Only for 20% of sample firms does the cumulative return on assets exceed that of the median firm in their industry. These findings suggest a very significant cost of the failure to exit in terms of lost operating performance.

These statistics quantify the cost of excessive continuation based on measures of operating performance. By comparison, existing estimates of direct bankruptcy costs are typically in the 3% to 6% range (Warner (1977); Weiss (1990); Altman (1984); LoPucki and Doherty (2004)).[15] Based on the reduction in cash flows margins in distress, Andrade and Kaplan (1998) estimate the total cost of financial distress to be between 10% and 20% of firm value. Our estimates suggest that the cost of excessive continuation may amount to a substantial fraction of overall distress costs. Interestingly, Andrade and Kaplan (1998) also identify the failure of their sample firms to reorganize in a timely manner as an important source of distress costs. Overall, with hindsight it appears that simply placing all our sample firms in bankruptcy indiscriminately as soon as their q falls below one could have resulted in substantial savings even after factoring in possible bankruptcy costs.

INSERT TABLE III HERE

The last set of statistics in Table III shows the evolution of the stock of tangible assets at replacement cost. As previously documented in Table II, the average decline in this proxy for the liquidation value of assets between entry and exit is 9.3%. Firms that recover subsequently reverse the decline in the asset stock. Nevertheless, Table III demonstrates that for more than a year average and median values of tangible assets continue to decline, while industry peers are in fact accumulating capital. Overall, over three years the median sample firm loses almost 11% of its tangible assets at replacement cost, compared with more than a twofold increase by other firms in the industry. Thus, our sample firms not only have substandard operating performance, but they also appear to finance their losses by reducing their tangible assets, and in particular, working capital. Such

[15] Estimates by Bris, Welch and Zhu (2005) range from zero to as much as 20% of assets. However, their firms are much smaller than those in our sample.

behavior destroys value, and is also likely to increase the cost of debt ex ante.

IV. Which Firms Can Avoid Exit?

If continuation beyond the efficiency threshold is so costly for the creditors, what are the factors that facilitate continuations for inefficient firms? Hypothesis 2 states that excessive continuation is more likely if the bulk of the debt is long term and the firm has sufficient liquid assets to honor its current obligations. Moreover, when debt is held by dispersed public bondholders, co-ordination failures among them and the lack of enforcement mechanisms can be expected to exacerbate the problem. Finally, more entrenched managers are likely to favor continuation beyond the efficiency threshold because even the remote chance of recovery creates enough incentive to substitute assets away from creditors to equity holders. In this section, we employ survival analysis to test how asset liquidity, debt maturity, the composition of debt, and managerial entrenchment affect the hazard of bankruptcy and acquisition.

A. Empirical proxies

Managers of levered firms can choose to exit by filing for bankruptcy at any time. In addition to bankruptcy, they may actively seek exit through an acquisition. However, acquisitions of financially distressed firms outside of bankruptcy may be difficult in the presence of multiple public bondholders, and may also be challenged as fraudulent conveyance. For these reasons, even in the presence of a viable acquiror, bankruptcy filing may precede the sale (see Hotchkiss and Mooradian (1998) on firm sales in bankruptcy). We study the determinants of exit through bankruptcy or acquisition, treating them as decisions that the firm's management can adopt. By contrast, even though the distressed firm can also exit our sample by "recovering" in the sense that its q raises above one, we treat this type of exit as a random event, since managers do not influence the q ratio directly, and therefore recovery in this sense is not a result of a conscious decision.[16]

[16]Recovery, of course, may be facilitated by managers' actions. However, since we do not observe such actions, their effect in our tests would be absorbed by the error term.

A number of empirical models have been developed for predicting bankruptcy.[17] By contrast, empirical studies of the determinants of mergers have thus far met with only limited success in explaining which firms get acquired.[18] Our purpose in this paper is not so much to improve over the existing models as to understand which factors facilitate inefficient continuations for our firms. In view of this, since most exits are likely to be through bankruptcy, we use the augmented bankruptcy prediction model by Zmijewski (1984) to account for factors considered important in the existing literature. While this choice of the baseline model is arbitrary for our purposes, Shumway (2001) finds that the Zmijewski model has significant predictive power, outperforming in particular the z-score model of Altman (1968).

The Zmijewski model includes three accounting-based predictors of bankruptcy, namely, *net income over total assets*, *total liabilities over total assets*, and the *current ratio*. These three variables measure, respectively, the firm's ability to generate cash flow, the degree of its indebtedness, and its ability to meet its current obligations out of its current assets. To these three variables, we add the logarithm of the total assets as a measure of size, which studies of both bankruptcies and mergers and acquisitions find to be important. Shleifer and Vishny (1992) predict that industry conditions may affect the sale price of the firm's assets in distress. Empirically, Acharya, Bharath, and Srinivasan (2007) find that recovery rates in distressed industries are lower, providing empirical support for this argument. Following them, to control for this possibility, we include the median *industry sales growth*, as well as the dummy variable for *industry distress*, which equals one when the median industry return is below –30%. We also control for the competitive environment in the industry by including the industry *Herfindahl* sales index. Finally, in specifications that do not explicitly allow for changes in the hazard rate over time, we add (the square root of) the number of months the firm has spent in distress.

We hypothesize that the probability of exit is higher for firm with low Tobin's q. Additionally, we include variables that proxy for the firm's ability to continue servicing its debt without defaulting. We hypothesize that a higher proportion of bonds relative to institutional debt decreases the probability of exit due to the hold-out problem and the lack of monitoring by public bondhold-

[17] Important contributions include Altman (1968), Ohlson (1974), Zmijevski (1984), Shumway (2001), Chava and Jarrow (2004), Campbell *et al.* (2004), and Bharath and Shumway (2008).

[18] See reviews by Siegfried and Evans (1994) and Caves (1998).

ers. By contrast, the presence of short-term debt could potentially play a disciplining role. As the impact of debt maturity is likely to be non-linear, we use the proportion of *long term to total debt*, expecting it to be negatively correlated with the probability of exit. Another factor that can facilitate survival is the ability of the firm to sell assets in distress. Since most of our firms have covenants that restrict asset sales (see Section V), and since sales of fixed asset may be challenged by creditors, we focus on the possibility of reducing current assets, and in particular, working capital, as a source of raising cash in distress (DeAngelo, DeAngelo, and Wruck (2002)). We thus include the ratio of *working capital to total assets* as a proxy for the ease with which assets can be converted to cash. Finally, we also include the proportion of the common equity owned by the top five executives, to test whether the alignment of the CEO's interests with those of equityholders affects the probability of exit for inefficient firms.

B. Econometric specification

To study the factors that determine the likelihood of exit, we employ hazard rate analysis, which in recent years has become a standard tool in bankruptcy-predicting models (Shumway (2001); Chava and Jarrow (2004); Bharath and Shumway (2008); and Campbell, Hilscher, and Szilagyi (2008)).[19] Specifically, we use a discrete-time hazard model, which Shumway (2001) shows to be equivalent to a logit model estimated using all available observations for exiting and non-exiting firms (see also Chava and Jarrow (2004)). We assume that, as long as the firm's q is below one and until it exits the distressed sample by any means, it is under the risk of bankruptcy and acquisition. Since most of our independent variables are constructed using quarterly Compustat and thus are observed at quarterly intervals, we treat each fiscal quarter as a life-at-risk interval. We estimate both "single destination" models (treating bankruptcy and acquisition as equivalent), and "competing destination" models (where the two types of exit are distinct). In a "single destination" hazard model the censoring variable is 1 if the firm exits the sample either through bankruptcy or acquisition, and 0 otherwise. In a competing risk or competing destination hazard, the censoring variable for bankruptcy is 1 if the firm exits through bankruptcy and 0 otherwise, and the censoring

[19] Earlier studies also employ discriminant analysis and simple probit and logit regressions (Altman (1968), Ohlson (1974), Zmijevski (1984)).

variable for acquisition is 1 if the decision unit exits through acquisition and 0 otherwise, so that the bankruptcy and acquisition risks are assessed separately.

C. Regression results

Table IV reports hazard regression results. Our baseline model is reported for different types of exit in columns (1) to (3). Model (1) and (2) are for competing hazard risks of bankruptcy and acquisition, respectively, and models (3) to (8) are single-destination hazard, that is, for exit either through either bankruptcy or acquisition. Hence, in model (1) the dependent variable is 1 if within the next quarter the firm files for bankruptcy, and 0 otherwise. In model (2) the dependent variable is 1 if within the next quarter the firm is acquired, and 0 otherwise. In models (3) to (8) the dependent variable is 1 if within the next quarter the firm files for bankruptcy *or* is acquired, and 0 otherwise.

The effect of the control variables reported in Table IV is consistent with expectations for bankruptcy predictions. However, they are usually insignificant for acquisitions, which is consistent with generally low explanatory power for acquisitions in extant papers (Siegfried and Evans (1994); Caves (1998)). Larger firms are less likely to exit, although the effect is rarely statistically significant. Consistent with Zmijevski (1984), less profitable, more highly levered, and less liquid (as measured by the current ratio) firms have a higher probability of bankruptcy. With few exceptions, industry variables are usually insignificant, although there is a tendency for fewer bankruptcies in more levered industries.

INSERT TABLE IV HERE

Table IV demonstrates that the probability of exit is negatively related to the firm's q ratio. This supports the hypothesis that lower-q firms are less efficient, and are therefore the most likely candidates for exit. This tendency has been documented empirically in studies of mergers and acquisitions (Servaes (1991)). The effect of other variables is also generally consistent with Hypothesis 2. We see that public debt and long term debt both decrease the probability of exit. Moreover, a high proportion of working capital, which can be converted to cash relatively easily, also facilitates

continuation. All these variables have the predicted sign, and are strongly significant statistically. We do not find that managers' share ownership affects the decision to exit, perhaps because their reluctance to exit due to the fear for their jobs aligns with equityholders' desire for continuation due to the asset substitution incentives.

Overall, our tests reported in Table IV show that disciplinary pressure of debt can be materially undercut by highly liquid asset structures, longer debt maturities, and high proportions of uncoordinated public bondholders among the firm's creditors. We now look at whether by incorporating restrictive covenants creditors can to some extent mitigate the excessive continuation problem.

V. The Role of Debt Covenants

Starting from Jensen and Meckling (1976), Myers (1977), and Smith and Warner (1979), it has been argued that agency conflicts between the firm's shareholders and its creditors can be mitigated by the appropriate design of debt covenants. We test whether firms' reluctance to exit in distress can be controlled by including certain types of covenants in bond indentures and bank loan contracts.

We extract information on bond covenants from the Fixed Income Securities Database (FISD). FISD includes information on a number of different covenants, both negative (prohibiting certain actions) and affirmative (restricting admissible performance and prescribing actions in certain contingencies, for instance, upon a rating downgrade). Information on bank loan covenants is taken from DealScan. Compared to FISD, DealScan describes fewer 'general' or covenants, and provides more details on financial covenants that restrict firm's financial ratios.[20]

We focus on eight major covenant groups that may potentially be relevant in reducing excessive continuations of unprofitable firms. The first five restrict the firm's decisions regarding: (1) dividend payments, (2) investment policy, (3) asset sales, (4) new debt issuance, and (5) new equity issuance. We group financial covenants that require a certain level of financial performance in two categories: (6) leverage tests, including various types of minimum net worth covenants, and (7) cash flow tests, which restrict measures of earning, such as EBITDA divided by interest expense. Finally, category

[20]See Billett, King, and Mauer (2007) for a detailed description of FISD covenants, and Bradley and Roberts (2004) for DealScan covenants.

(8) includes the put provision activated upon the change in control (poison put). This covenant is available in FISD but not in DealScan.[21]

For each firm on each date, we check the presence of each of these covenant types in at least one of the outstanding debt contracts. Thus, we construct a set of indicator variables describing the presence of each covenant type, separately for bonds and for loans. We then use these dummy variables as predictors in logit regressions of exit, to see whether the presence of particular covenant types reduces excessive continuations.

Panels A and B of Table V describe the results of these tests for loan and bond covenants, respectively. The first column in each panel shows the fraction of firms in the sample with each covenant type. For both bonds and loans, restrictions on asset sales and leverage are common for our firms. Covenants that restrict the firm's ability to incur additional debt appear for 88.5% of our firms when we look at bond contracts, but only for 34.8% of firms when we look at bank loans. Banks may be less concerned with this covenant either because there are other covenants that allow them to exert influence on the firm's financing policy, or because their debt is senior, and the issuance of new lower-priority debt does not hurt banks as much. Loan contracts, however, include an equity issuance sweep provision more often than bond indentures include restrictions on new equity financing. Finally, we find financial covenants specifying the required minimum cash flow for only 4.7% of sample firms, according to FISD. Yet such covenants are extremely common in bank loans: restrictions on various ratios of cash flow to debt are found for 68.8% of firms. Overall, the incidence of bond covenants for our sample of distressed junk firms is high compared with the 9% to 44% range reported in the earlier literature for broader samples (see, for instance, Nash, Netter and Poulsen (2003)), but more similar to other studies based on FISD data (Billett, King, and Mauer (2007)). This is consistent with the tendency of riskier firms to have more bond covenants, documented in extant studies cited above. Bond covenants are no less frequent than loan covenants, but their types are often very different. In particular, financial covenants are seldom found in bond indentures, but are common in loan contracts.

[21] FISD includes another covenant that restricts mergers. We cannot use that covenant in our tests because almost all our firms have it, including all acquired firms, and as a result it has no predictive power. In addition, FISD reports some other covenants not included in DealScan, such as cross-default provisions. These covenants are insignificant in predicting exit in our sample, and we do not include them here to conserve space.

We test whether the presence of a particular covenant affects the decision to exit by estimating logit regressions of exit on the covenant dummy. These regressions are reported in columns (2) to (4) of Table V. There is a high degree of correlation between the presence of different covenants (see Billett, King, and Mauer (2007)). For this reason, we estimate these regressions separately for each covenant, rather than for all of them together.[22] In each regression reported in each row for columns (2) to (4) of Table V, the only independent variable in addition to the intercept is the covenant dummy, while the dependent variables are bankruptcy, acquisition, and "bankruptcy or acquisition" dummies, respectively.[23]

INSERT TABLE V HERE

Panel A of Table V shows that in general loan covenants do not affect the likelihood of exit significantly. This is consistent with the notion that banks renegotiate covenants upon violation, rather than trigger bankruptcy. Private debt covenants appear to be of little relevance for public bondholders, and cannot be relied on as means of controlling asset substitution. The only important bank covenant that increases the probability of bankruptcy is that restricting asset sales. To ensure the preservation of the asset base for creditors in default, banks may be unwilling to relax restrictions on asset sales to save the firm from bankruptcy.

Panel B shows that asset sale restrictions are also important in bond indentures. In addition, and in contrast to loans, a number of other bond covenants also affect the probability of exit through bankruptcy. Similar to asset sale restrictions, equity issuance restrictions limit the ability of the firm to resolve liquidity problems, and increase the probability of bankruptcy.[24] By contrast, restrictions on dividend payments reduce the probability of bankruptcy, as cash is conserved within the firm, even though creditors of our firms may in fact prefer earlier bankruptcy. (Their preference for bankruptcy, of course, is unlikely to extend to those cases when the firm runs out of cash because

[22]Because we are interested in the ex post effect of covenants, we take the covenant structure as given. Other studies look at how the presence of covenants is related to firm characteristics (Nash, Netter and Poulsen (2003); Bradley and Roberts (2004); Billett, King, and Mauer (2007)).

[23]The first two regressions in column (3) are not estimated due to the low variation of the covenant dummies, coupled with the low number of acquisition in the sample.

[24]Franks and Sanzhar (2006) find many distressed firms which are able to raise new equity in distress, thereby overcoming the debt overhang problem.

it pays large dividends to shareholders.) The presence of the poison put provision significantly increases the probability of bankruptcy.

Importantly, firms are more likely to file for bankruptcy when the bond indenture includes restrictions on leverage or net worth. These financial covenants appear to serve as a tripwire, which is triggered when the firm's performance deteriorates, and which allows the creditors to stop the destruction of value through unprofitable operations. These leverage-based covenants in FISD are much more common than cash flow-based covenants, which are not significant in our tests. However, with hindsight, these covenants may not have been set tightly enough to allow creditors more control over firms that turned out to be inefficient. Indeed, even thought restrictions on leverage or net worth are observed for 77.3% of sample firms, only 42.9% of those firms do file for bankruptcy. (For comparison, only 18.6% of firms without a leverage-type bond covenant declare bankruptcy.) These results stand in contrast with loan covenants, which are set so tightly that they are violated for about one-quarter to one-third of all loans, including those of firms that are not distressed (Dichev and Skinner (2002), Chava and Roberts (2008)).

Overall, Table V suggests that once the firm is in distress, the presence of bond covenants may mitigate the asset substitution problem, in particular by forcing bankruptcy of inefficient firms. However, financial covenants in bond contracts may not always be set tightly enough for the creditors to be able to trigger reorganization early. By contrast, even though bank covenants may be set tightly, but their presence per se rarely affects firm exit. An exception is restrictions on asset sales, which increase the probability of bankruptcy both for public and for private debt.

VI. Conclusions

In this paper we study a sample of highly-levered firms whose market value under the status quo is below the replacement cost of their assets. We find that, even though 80% of these firms underperform the industry median over time, few of them are acquired or file for bankruptcy in a timely manner. Given a liquid asset structure, low current debt service, and a low proportion of institutional debt, they are able to continue money losing operations for many years. They finance their losses by liquidating working capital, thereby reducing the pool of assets available to creditors.

Restrictions on assets sales facilitate exit of these firms, but most other private debt covenants do not. While many public bond covenants help, with hindsight they may not be restrictive enough, as the majority of sample firms do avoid exit.

Our study suggests potentially high costs of one particular type of asset substitution, namely, the failure of firms to exit the business in a timely manner. An interesting symmetric research question is, do many profitable firms exit too early due to debt overhang? Quantifying this and other aspects of the agency costs of debt is an important step towards better understanding of firms' financing decisions.

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Table I. Descriptive statistics

The table reports descriptive statistics for high-yield firms whose Tobin's q falls below one. Column (1) is for all firms in the month when the q falls below one for the first time. Columns (2) to (4) are for firms that subsequently exit the sample through recovery (defined as q rising above one), acquisition, and bankruptcy, respectively. or were acquired during the sample period, in the month before they filed (were acquired, respectively).

		All	By outcome		
		firms	Recovery	Acquisition	Bankruptcy
		(1)	(2)	(3)	(4)
Book assets	mean	3,466	3,706	2,836	3,308
($ Mil.)	median	1,390	1,465	1,192	1,171
	std. dev.	6,129	6,074	4,836	7,370
	N	371	194	28	98
Replacement cost	mean	2,726	2,982	2,231	2,359
($ Mil.)	median	1,193	1,259	920	949
	std. dev.	4,600	4,913	3,456	4,712
	N	371	194	28	98
Operating income/Assets	mean	-0.200%	1.054%	0.560%	-3.39%
	median	1.16%	1.38%	1.17%	-0.13%
	std. dev.	6.57%	3.3%	2.26%	10.9%
	N	342	175	27	95
MTB Assets	mean	0.67	0.72	0.61	0.61
	median	0.68	0.74	0.63	0.63
	std. dev.	0.17	0.15	0.17	0.16
	N	371	194	28	98
Market leverage	mean	0.60	0.58	0.62	0.68
	median	0.60	0.58	0.57	0.69
	std. dev.	0.20	0.18	0.24	0.19
	N	366	191	28	97
Book leverage	mean	0.47	0.45	0.44	0.55
	median	0.43	0.43	0.39	0.53
	std. dev.	0.21	0.17	0.22	0.25
	N	367	192	28	97
Bonds/Total debt	mean	0.64	0.62	0.69	0.67
	median	0.63	0.60	0.69	0.65
	std. dev.	0.24	0.25	0.21	0.22
	N	367	192	28	97

Table II. Changes in Assets and Liabilities, and Market Returns from Entry to Exit

The table reports changes in various variables at the time when the firm exits the sample relative to the month when its q falls below one. Column (1) is for all firms, and columns (2) to (4) are for firms that exit the sample by recovering, being acquired, and filing for bankruptcy, respectively.

		All	By outcome		
		firms	Recovery	Acquisition	Bankruptcy
		(1)	(2)	(3)	(4)
Replacement cost	mean	-9.30%	-6.56%	-4.55%	-16.17%
	median	-6.55%	-4.75%	-4.73%	-15.03%
	std. dev.	24.1%	26.1%	17.6%	19.5%
	N	190	120	13	57
	significance	***	***		***
Repl. cost/Total debt	mean	-11.81%	-11.26%	-0.84%	-15.59%
	median	-5.17%	-4.00%	-1.63%	-14.22%
	std. dev.	47.1%	48.8%	59.3%	39.9%
	N	188	120	13	55
	significance	***	**		***
Total debt	mean	0.28%	3.43%	-1.05%	-6.05%
	median	-0.32%	-0.59%	-0.48%	0.00%
	std. dev.	37.9%	43.4%	22.9%	26.0%
	N	190	120	13	57
	significance				*
Bank debt	mean	-12.41%	-18.81%	-2.25%	-6.05%
	median	0.00%	-2.92%	0.00%	0.00%
	std. dev.	37.0%	44.4%	12.6%	27.5%
	N	76	40	7	29
	significance	***	***		
Market value of assets	mean	-5.12%	10.97%	-32.39%	-47.63%
	median	0.65%	8.32%	-24.60%	-45.66%
	std. dev.	37.4%	28.0%	29.9%	25.2%
	N	169	120	10	39
	significance	*	***	***	***
Equity returns	mean	-17.89%	11.93%	-51.71%	-77.76%
	median	-7.84%	13.73%	-57.84%	-89.29%
	std. dev.	53.1%	37.1%	32.4%	25.3%
	N	185	120	12	53
	significance	***	***	***	***
Bond returns	mean	-3.14%	16.47%	-24.60%	-44.30%
	median	3.21%	10.37%	-7.86%	-52.66%
	std. dev.	38.1%	22.7%	29.0%	33.4%
	N	178	117	11	50
	significance		***	***	***

Table III. Firm Profitability and Asset Values Over Time

For each quarter after entering the sample, this table reports the return on assets, the profit margin, the cumulative return on assets since entering the sample, and the cumulative change in replacement costs. The number of quarters passed since the quarter end in which Tobin's q falls below one, referred to as quarter zero, is given by column headers. *Return on assets* is net income in each quarter divided by total assets. *Profit margin* is EBIT divided by sales. *Cumulative return on assets* is total net income since quarter zero divided by the initial value of total assets. *Cumulative change in replacement cost* is the percentage change in replacement cost of fixed and current assets since quarter zero. Firm mean and median are statistics for sample firms. Control samples for each firm consist of all firms in the same three-digit industry. Fraction underperforming is the proportion of sample firms in each quarter with the value of the variable below its control sample's median. All differences in medians between sample and control firms are significant at 1%.

	Quarter since entering the sample											
	1	2	3	4	5	6	7	8	9	10	11	12
Return on assets												
Firm mean	-2.14%	-3.01%	-1.90%	-0.89%	-1.75%	-1.46%	-0.30%	-0.43%	-1.07%	-0.70%	-0.14%	-0.07%
Control sample mean	-0.30%	-0.62%	-0.09%	-1.02%	-0.23%	-1.93%	0.43%	0.00%	-0.39%	0.24%	-6.02%	-6.00%
Firm median	0.03%	-0.15%	-0.02%	0.05%	-0.03%	0.07%	0.28%	0.36%	0.21%	0.29%	0.31%	0.35%
Control sample median	0.58%	0.50%	0.66%	0.63%	0.62%	0.63%	0.67%	0.77%	0.74%	0.77%	0.68%	0.84%
Fraction underperforming	69.1%	67.7%	70.9%	67.4%	71.6%	64.8%	63.7%	63.1%	64.3%	64.1%	60.6%	64.4%
N	362	347	330	316	303	290	281	271	263	256	246	233
Profit margin												
Firm mean	-102%	-165%	-223%	-312%	-337%	-379%	-443%	-499%	-522%	-568%	-764%	-1002%
Control sample mean	5.36%	2.35%	4.66%	7.53%	7.16%	12.97%	11.32%	12.27%	13.27%	16.08%	14.57%	16.95%
Firm median	3.58%	2.43%	2.95%	3.54%	3.61%	3.77%	4.69%	5.07%	3.95%	5.07%	4.83%	4.84%
Control sample median	5.59%	5.20%	5.76%	6.72%	7.58%	7.92%	7.83%	8.64%	8.95%	9.81%	10.34%	11.62%
Fraction underperforming	59.7%	62.0%	56.6%	57.2%	61.2%	56.2%	54.8%	55.0%	56.3%	60.6%	58.2%	57.7%
N	350	334	320	304	291	281	270	260	256	249	237	227
Cumulative return on assets												
Firm mean	-2.11%	-4.43%	-5.71%	-6.39%	-7.33%	-8.01%	-8.02%	-8.20%	-8.66%	-9.15%	-9.36%	-9.39%
Control sample mean	0.09%	0.14%	0.60%	1.38%	2.50%	1.85%	2.52%	3.79%	4.63%	5.53%	6.29%	7.43%
Firm median	0.02%	-0.34%	-0.97%	-1.23%	-1.69%	-2.35%	-2.29%	-2.64%	-3.25%	-4.44%	-4.62%	-4.28%
Control sample median	0.40%	0.74%	1.22%	1.61%	2.19%	2.81%	3.30%	3.40%	3.85%	4.08%	4.28%	4.43%
Fraction underperforming	70.0%	73.2%	75.7%	76.7%	79.2%	78.6%	78.4%	77.8%	79.4%	79.5%	80.1%	79.7%
N	367	365	367	365	365	365	365	365	364	365	361	359
Cumulative change in replacement cost												
Firm mean	-0.51%	-1.31%	-1.98%	-3.07%	-4.18%	-4.62%	-3.16%	-0.80%	-0.93%	-2.71%	-1.05%	2.20%
Control sample mean	19.98%	41.51%	96.82%	118.02%	149.70%	214.36%	243.21%	271.37%	306.25%	338.49%	502.73%	547.33%
Firm median	-0.38%	-1.02%	-2.19%	-4.65%	-5.40%	-6.84%	-6.74%	-8.10%	-11.06%	-12.43%	-12.05%	-10.74%
Control sample median	3.07%	10.71%	18.45%	23.33%	26.26%	38.84%	38.71%	52.03%	57.67%	75.44%	88.26%	108.85%
Fraction underperforming	59.9%	62.2%	63.9%	65.5%	65.4%	64.7%	65.5%	66.7%	67.9%	68.7%	68.7%	68.0%
N	354	352	352	357	353	351	351	354	352	348	348	344

Table IV. Determinants of Exit

This table reports the results of logit regressions of the exit decision. In regressions (1) and (2) the dependent variable equals one if within the next quarter the firm files for bankruptcy (for regression (1)) or is acquired (for regression (2)), and zero otherwise. In regressions (3) to (8) the dependent variable equals one if within the next quarter the firm either files for bankruptcy or is acquired, and zero otherwise. The sample consists of firm-quarter observations where Tobin's q is below one. *TA* is the book value of total assets. *Current ratio* is current assets divided by current liabilities. *Working capital* is the difference between current assets and current liabilities. *Long term debt* is total debt less debt in current liabilities. *Managerial shareholding* is the percentage of common equity owned by the five highest-paid executives. Absolute values of robust Huber-White z-statistics are reported in parentheses. Coefficients marked ***, **, and * are significant at the 1%, 5%, and 10% significance level, respectively.

	Bankr.	Acq.	Exit	Exit				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log-TA	-0.13	-0.22	-0.14	-0.01	-0.24**	-0.10	-0.32**	-0.27
	(1.06)	(1.58)	(1.46)	(0.13)	(2.40)	(0.97)	(1.99)	(1.44)
Net income / TA	-3.39**	1.85	-2.75**	-1.10	-2.46*	-1.37	1.70	2.65
	(1.99)	(0.60)	(2.09)	(0.62)	(1.75)	(0.77)	(0.57)	(0.78)
Total liabilities / TA	3.89***	1.52	3.39***	3.68***	3.87***	2.64***	4.16***	4.07***
	(4.73)	(1.30)	(5.11)	(4.93)	(5.30)	(3.54)	(4.50)	(2.90)
Current ratio	-1.35***	0.22	-0.65**	0.03	-0.54*	0.28	-0.43	0.29
	(3.48)	(1.13)	(2.19)	(0.11)	(1.85)	(1.38)	(0.74)	(0.49)
Ind. sales growth	-2.18	5.23	-1.02	-1.05	-0.75	-2.31	-4.06	-3.60
	(0.56)	(1.03)	(0.33)	(0.34)	(0.24)	(0.68)	(1.00)	(0.93)
Ind. Herfindahl	4.16	-17.43	0.77	-1.70	-0.89	0.43	10.81	3.04
	(1.19)	(1.25)	(0.22)	(0.33)	(0.24)	(0.10)	(1.64)	(0.41)
Ind. leverage	-2.37*	-1.44	-2.04*	-0.23	-2.03*	-2.18*	-1.15	-0.71
	(1.70)	(0.87)	(1.78)	(0.19)	(1.81)	(1.82)	(0.62)	(0.35)
Tobin's q	-4.99***	-3.39***	-4.40***	-4.26***	-5.33***	-4.58***	-4.63***	-5.41***
	(6.54)	(3.71)	(6.89)	(5.92)	(7.26)	(7.17)	(5.10)	(4.90)
Long term / Total debt				-3.00***				-2.33*
				(5.70)				(1.93)
Bonds / Total debt					-2.49***			-2.87***
					(3.97)			(2.85)
Working capital / TA						-3.76***		-0.77
						(5.30)		(0.40)
Managerial shareholding							-1.73	-2.90
							(0.95)	(1.01)
Log-time	-0.14	-0.17	-0.16	-0.18	-0.17	-0.15	-0.15	-0.02
	(0.98)	(0.89)	(1.41)	(1.53)	(1.54)	(1.28)	(0.91)	(0.14)
const.	-0.43	-1.43	-0.59	-0.68	1.84	-1.26	-0.02	2.54
	(0.25)	(0.71)	(0.41)	(0.51)	(1.23)	(0.91)	(0.01)	(1.19)
N	2711	2711	2711	2711	2711	2711	1590	1590

Table V. Debt covenants as exit triggers

This table reports the incidence of various debt covenants (column (1)), and their impact on the exit decision. Columns (2) to (4) report coefficients from logit regressions of exit on each individual covenant dummy and a constant. These regressions are estimated separately for each covenant. In regressions (2) and (3) the dependent variable equals one if within the next quarter the firm files for bankruptcy or is acquired, respectively, and zero otherwise. In regressions (3) the dependent variable equals one if within the next quarter the firm either files for bankruptcy or is acquired, and zero otherwise. The sample consists of firm-quarter observations where Tobin's q is below one. Panel A is for bank debt covenants included in the DealScan database. Panel B is for covenants included in the FISD database for outstanding bonds. Absolute values of robust Huber-White z-statistics are reported in parentheses. Coefficients marked ***, **, and * are significant at the 1%, 5%, and 10% significance level, respectively.

	Freq.	Bankr.	Acq.	Both
	(1)	(2)	(3)	(4)
Panel A: Bank loan covenants				
Dividend restr.	6.0%	0.01		-0.24
		(0.03)		(0.44)
Investment restr.	3.6%	0.37		0.12
		(0.65)		(0.21)
Asset sale restr.	47.9%	0.65***	-0.05	0.53***
		(3.37)	(0.15)	(3.00)
Debt issuance restr.	34.8%	0.32	-0.16	0.21
		(1.54)	(0.42)	(1.14)
Equity issuance restr.	30.7%	0.34	-0.26	0.28
		(1.58)	(0.60)	(1.39)
Leverage test	49.9%	0.02	-0.32	-0.04
		(0.10)	(0.91)	(0.26)
Cash flow test	68.8%	0.20	-0.55*	0.04
		(1.03)	(1.65)	(0.22)
Panel B: Bond covenants				
Dividend restr.	8.2%	-0.70	-0.49	-0.76*
		(1.50)	(0.67)	(1.78)
Investment restr.	5.5%	0.46	0.59	0.45
		(1.18)	(0.92)	(1.22)
Asset sale restr.	64.1%	0.77***	0.22	0.59***
		(3.54)	(0.64)	(3.08)
Debt issuance restr.	88.5%	0.37	0.36	0.32
		(1.27)	(0.74)	(1.23)
Equity issuance restr.	8.5%	0.82**	-0.05	0.71**
		(2.41)	(0.07)	(2.23)
Leverage test	77.3%	0.98***	0.16	0.73***
		(3.71)	(0.45)	(3.29)
Cash flow test	4.7%	-0.46	-0.45	-0.72
		(0.80)	(0.45)	(1.24)
Poison put	80.8%	0.98***	0.16	0.74***
		(3.62)	(0.44)	(3.24)

Figure 1. Exits of sample firms

These picture shows the number of firms by the type of exit, as well as subsequent distress of recovered firms.

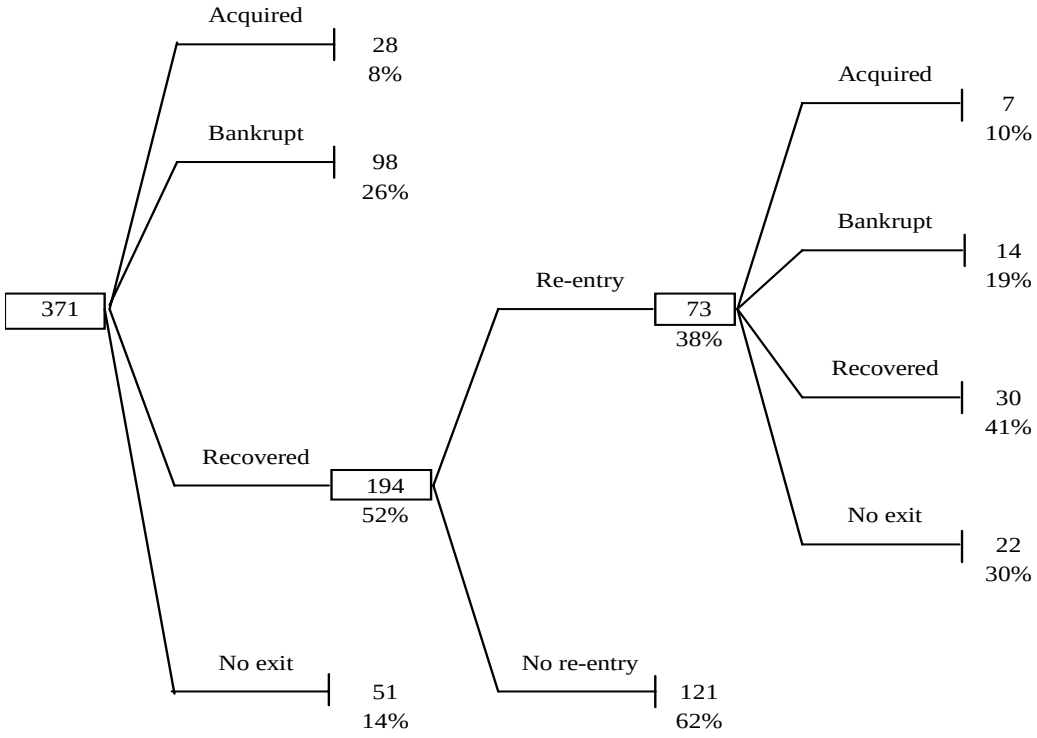

Figure 2. Bankruptcies and acquisitions of low-q firms

These graphs show the percentage of firms that file for bankruptcy and that are acquired over time, after their Tobin's q falls below one.