Preliminary Draft—January 28, 2007
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Value Destruction in the New Era of Chapter 11

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Abstract

Over the past two decades in the United States, control over the US bankruptcy reorganization process has shifted from debtor's pre-bankruptcy managers to holders of secured claims. The result has been increased adherence to absolute priority and a harder landing for the debtor's managers and shareholders. Because managers still make the decision whether or when to file a bankruptcy petition, we hypothesize that anticipation of bankruptcy under these new conditions will result in a delay in filing, increased leverage, increased secured debt, and a reduction of asset value for firms at the time they file. We present empirical evidence consistent with our hypothesis and offer a conjecture that the delays in filing destroys value that is unlikely to be offset by savings from the delay or possible avoidance of bankruptcy.

I. Introduction

Challenged by a large debt obligation, primarily to its employees, Continental Airlines filed for Chapter 11 bankruptcy protection in September 1983. This filing, like some others at the time, was widely believed to have been unnecessary, "a strategic maneuver for debtors, routinely employed to deal with business downturn."[1] Contrast the case of General Motors. In 2006, faced with staggering losses and a looming inability to pay its debt as it became due, the auto maker refinanced $5.6 billion of its obligations with secured debt—a move that greatly devalued the company's outstanding general obligations. GM, which suffered another $39 billion in losses (including $1.6 billion in operating losses) in just the third quarter of 2007, may yet enter bankruptcy, but it is trying mightily to avoid this fate. These two high-profile cases, while in some respects idiosyncratic, are illustrative of a general trend that can be traced to changes in bankruptcy practice.

The trend toward delay of bankruptcy initiation can be traced from the adoption of the current Bankruptcy Code in 1978. From that time through the decade of the 1980s a debtor's pre-bankruptcy management, elected by shareholders, controlled both the debtor and the Chapter 11 process. Bankruptcy was not costless to managers, who often lost their jobs in the end, sometimes because the debtor was liquidated. Bankruptcy also took its toll on equity, which earned only a small return for its shares when debt could not be satisfied fully. But Chapter 11 was not an automatic death sentence to either management or equity. Some managers kept their jobs throughout the bankruptcy process and retained them in the reorganized firm, while equity was rarely eliminated entirely even where priority for debt over equity should have left the shareholders with nothing. The seas began to change in the 1990s, as courts began more often to heed complaints by creditors, who did not understand why they, as the aggrieved parties to the insolvency, were left at the mercy of the managers and shareholders responsible for the debtor's plight. At or about the turn of the new century, a shift from debtor to creditor control was largely accomplished and widely reported.

Also widely reported has been the role of the secured creditor, which now frequently swoops in prior to bankruptcy and, perhaps aided by a 2001 change in the Uniform Commercial Code, presents distressed debtors with a Faustian bargain: New capital now in exchange for a surrender of

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[1] Katz (1992).

control, both before bankruptcy and, if the new funds do not save the firm, in Chapter 11 as well. Perhaps as a result, today more than twenty years ago, managers lose their jobs, debtors are liquidated, and equity is eliminated without any return.

Prior literature documenting the change in bankruptcy practice and the role of the secured creditor treats these phenomena as different aspects of a single trend. In this paper we delink the change in bankruptcy practice from the new control of the secured creditor and suggest the former may have caused the latter. We hypothesize that the hard landing for manager and equity in bankruptcy has induced managers to take on secured debt, whatever strings are attached, rather than file for bankruptcy at an earlier stage of financial, and perhaps economic, distress. This leads to a related hypothesis, that in the new era of Chapter 11 firms file for bankruptcy in weaker financial and economic condition than that of firms in the past. The data presented here support each of these hypotheses.

Part II below provides a brief review of related literature. Part III presents a model derived from standard accounts of overinvestment and states our hypotheses based on the model. Part IV describes our methodology and offers data analysis, including an analysis of alternative explanations for our results. Part V provides a conclusion and identifies legal reforms that might address the issues raised by our results.

II. Literature Review

Recent changes in bankruptcy practice are well documented. Skeel (2003) describes the new regime as "adjustments creditors have made in an effort to reassert control in bankruptcy". Baird and Rasmussen (2002, 2003) argue that debtor-in-possession (DIP) lenders "have come effectively to control the bankruptcy process." Each of these authorities, among others, observes not only increased creditor control within Chapter 11, but at earlier stages of financial distress, in anticipation of bankruptcy. There is disagreement over whether the changes have been for better or worse. Baird and Rasmussen (2002, 2003), for example, conclude that creditor control has been largely beneficial, upholding the absolute priority rule (APR), which minimizes the cost of capital, and permitting creditors efficiently to screen viable firms from non viable ones without interference from managers or shareholders who have a perverse investment incentive. In contrast, Skeel (2003), as well as LoPucki (2003) and Warren and Westbrook (2003), believe that creditor control unduly permits creditor destruction of viable firms. More specifically, Warren and Westbrook (2003) decry the shift from the DIP to what they call the SPIP (secured-party-in-possession), and lament that Chapter 11 has become "a sort of Super Article 9, invoked for the benefit of a single secured creditor" a development they see as a problem that requires congressional response. Regardless of the academic debate over the merits of the shift in bankruptcy practice, no one disputes that such a shift has occurred.

These accounts are largely anecdotal, but they are supported by more formal empirical research. The results of such research is consistent with bankruptcy increasingly providing a hard landing environment for the debtor's management and shareholders. Dahiya et al. (2003) find an increase in DIP financing (which proxies for secured creditor control) from 7% of bankruptcy cases in 1988 to 42% of bankruptcy cases in 1997. Capkun and Weiss (2007) find APR violations in 37% of recent cases, a substantial decrease compared to 70% reported by Franks and Torous (1989) or 78% reported by Weiss (1990), and violations in the recent study rarely favored equity. Ayotte and Morrison (2007) find a similar current incidence of APR violations and report that in recent cases top managers lose their jobs 70% of the time, a substantial increase over the 55% job loss reported by Gilson (1990) for the 1980s. Further review of the literature is provided in context of the relevant discussion.

III. An Overinvestment Model

In a simple overinvestment model derived from Bulow and Shoven (1978)[2], we assume that managers of a debtor firm represent themselves or shareholders and decide at time t_0 in a two period game whether to have the debtor file a bankruptcy petition or continue outside of bankruptcy until time t_1. We assume that bankruptcy ends management's and equity's unilateral control over the firm and permits the creditors to alter the firm's investment strategy, including by liquidation if liquidation is efficient. For simplicity, we assume that if the debtor continues at t_0 it will liquidate at t_1 (an artifact of the two period game) and will require bankruptcy at that time iff it is insolvent (liabilities exceed assets). Also for simplicity, we assume that all parties are risk neutral or diversified and we ignore the time value of money. We define the following terms and make the following additional assumptions:

- v is the value of the debtor, with v_c the expected value of the debtor at t_0 if it continues, until t_1, outside of bankruptcy and without a reduction in assets; v_C is described by $\int x \cdot f(x)dx$ where $f(x)$ is the distribution of value given continuation;

- v_b the value of the debtor at t_0 if it enters bankruptcy at that time; because the debtor can operate in bankruptcy if the firm's continuation value exceeds its liquidation value, but may otherwise liquidate, $v_b \geq v_c$;

- v_1 is the realized value of the debtor at t_1 if the debtor continues outside of bankruptcy at t_0;

- d is a debtor's aggregate debt, with d_0 the debtor's aggregate debt obligation at t_0, with d_m the portion of such debt matured—i.e., due and owing, at that time—and d_u the portion unmatured;

- d_s is the face amount of new debt required to refinance d_m so that the firm can continue outside of bankruptcy without a reduction of assets until t_1; this value is determined by d_m and $f(x)$, and because no debt is risk free, $d_s > d_m$; let $d_1 = d_s + d_u$;

- e_c is equity's and management's expected return from continuation outside of bankruptcy at t_0, a value equal to equity's option value on continuation of the firm, $\int_{d_1}^{\infty}[x - d_1] \cdot f(x)dx$;

- e_b is equity's and management's expected return from the bankruptcy at t_0; consistent with Bebchuk and Chang (1992), this value reflects the relative bargaining power of management and equity, on the one hand, and the creditors, on the other;

- y is the transactions cost of bankruptcy, determined by and increasing in v and d; for simplicity, it is assumed that y does not vary with the timing of bankruptcy, i.e., whether at t_0 or t_1 (even though v and d may vary over the interval).

From a social welfare perspective, where the bankruptcy transactions cost is positive, no firm that can continue efficiently at t_0 should file for bankruptcy at that time; i.e., $v_b = v_c$ and $y > 0$ implies that early bankruptcy is inefficient. Were bankruptcy costless, however, every firm that should liquidate at t_0 should enter bankruptcy at that time; i.e., because $v_b \geq v_c$, $y = 0$ implies that early bankruptcy is efficient. More generally, it is socially optimal for the debtor is to enter bankruptcy at t_0 iff $v_B - v_C \geq \left(\int_{d_1}^{\infty} f(x)dx\right) y$.[3] But management will file a bankruptcy petition at t_0 iff $e_b > e_c$.

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[2] See also White (1980); Gertner & Scharfstein (1992).

[3] To understand this inequality: note the assumptions stated above and assume further that $v_b \geq v_c$, which implies efficient liquidation at t_0; denote $\int_{d_1}^{\infty} f(x)dx$ as p_G, for the probability of a good outcome from continuation at that time; denote the probability of a poor outcome $p_P = (1 - p_G)$; let H represent the value of a good outcome and let P represent the value of a poor outcome. Given that bankruptcy transactions cost will be incurred iff the debtor enters

These expressions are not identical; so the model yields the possibility of inefficient bankruptcy initiation decisions.

This model is not sufficiently specified to determine whether bankruptcy occurs too late or too early (a matter discussed further in part III below), but the model does offer clear predictions as to the effects of a change in e_b, all else held constant. Let the expected return to equity and management in early years be e_{b_e} and let the related expected return in later years be e_{b_l}. We assume that $e_{b_e} > e_{b_l}$ and predict fewer bankruptcy petitions at t_0 as well as the following changes in the characteristics of firms that file for bankruptcy at t_1 (and thus, on average, in the corresponding characteristics for the population of all firms that file at any time):

- To refinance continuation, an increase in secured debt, d_s, including as a proportion of all debt, d_s/d_1;

- An increase in leverage, d_1/v_1, both because $d_s > d_m$, which implies $d_1 > d_0$, and because $v_b \geq v_c$, which implies $v_1 \leq v_b$ (on average);

- A reduction in asset value, v, again because $v_b \geq v_c$, which implies losses from continuation and $v_1 \leq v_b$ (each on average).

We turn next to an empirical test of the predictions generated by this model.

IV. Methodology and Data Analysis

We begin with Edward Altman's database to compile a sample of firms that filed for Chapter 11 bankruptcy in the US over the 12-year period from January 1993 to March 2004. This database provides a comprehensive list of all firms filing for bankruptcy with more than $100 million in liabilities. Our initial sample size is 827 firms. The Compustat database provides us with financial and industry information for the sample. Based on 2-digit SIC codes we exclude all financial firms, those with SIC codes ranging from 60 to 69. We also exclude firms where industry information was not available or where the company did not exist in the database. After these exclusions, we have a sample of 440 firms. To verify our sample, we confirm the bankruptcy filing dates in the Pacer (Administrative Office of the US Courts) database. To supplement our data, we obtain information on the filing venue and on the type of bankruptcy filing from the Pacer database and from Lynn LoPucki's Bankruptcy Research database. We then exclude firms for which we do not have all relevant information. This leaves us with a calibrated sample of 342 firms. Table 1 shows the sample selection process.

A. Descriptive Statistics

Panel A of Table 2 provides the descriptive statistics for the final sample of 342 bankrupt firms. Financial data corresponds to the last annual yearly financial statements available prior to bankruptcy filing, but not more than 2 years before the filing. On average, firms have total assets of $1,279 million (median of $389 million), ranging from $33 million to $100 billion. Liabilities range from $50 million to $46 billion with a mean of $1,026 million and a median of $360 million.[4]

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bankruptcy at t_0 or the debtor continues at that time and realizes a poor outcome from continuation, the social return from immediate bankruptcy, and thus immediate liquidation, is $v_B - y$, while the social return from continuation is $p_G G + p_P(P - y)$. Thus, bankruptcy at t_0 is efficient iff $v_B - y \geq p_G G + p_P P - p_P y$. Note that $p_G G + p_P P = v_C$. Algebraic manipulation reveals that bankruptcy at t_0 is efficient iff $v_B - v_C \geq p_G y$, which is the inequality offered in the text. Regarding the intuition, early bankruptcy is socially optimal if and only if the expected gains from immediate liquidation at least balance the lost opportunity for continuation to render unnecessary bankruptcy's transactions cost.

[4] Although the Altman database has a $100 million liability floor, verification of data from other sources leads us to include firms with lower liabilities. Our results are not sensitive to how we treat these firms.

Leverage, defined as ratio of total liabilities and total assets, has a mean of 1.07 (median of 0.92) and ranges from 0.10 to 3.49. In 42% of the cases (144 out of 342) leverage exceeds one. As a measure of activity we use sales turnover, defined as the ratio of sales to total assets. This ratio ranges from a low of 0.01 to a high of 7.82 with a mean and median of 1.19 and 1.07, respectively. As a measure of profitability we use income before extraordinary items scaled by total assets (ROA). We measure income over both a one and two year period. Typically, financial operating losses (measured on annual or quarterly basis) continue for 6 quarters prior to bankruptcy filing. The mean one-year income is -28% (median of +13%) while the mean two-year income is -37% (median of -20%). Liquidity is measured using both the ratio of working capital to total assets, and the ratio of current assets to total assets. The working capital ratio has a mean of -0.18 (median of 0.00), while the current assets ratio has a mean of 0.38 (median of 0.36). The current assets ratio, together with the ratio of property, plant and equipment to total assets measures the distribution of assets. Firms on average have 37% of their assets in PP&E (median of 34%). This ranges from 1% to 96%. Next, we use the ratio of secured debt to total liabilities to measure the presence of secured creditors in the pre-filing period. Secured debt represents, on average, 25% of total liabilities (median of 19%), and ranges from 0% to 89%. Market Leverage ranges from 0.01 to 1.00 with an average of 0.83 (median of 0.90). Finally, the Market-to-Book ratio ranges from -47.82 to 31.23 with a mean of 0.77 (median of 0.24).

The above statistics have all been identified by prior literature as good measures of financial and economic condition of firms filing for bankruptcy.[5] While financial and economic statistics used in these analyses differ from author to author, measures in all studies represent leverage, liquidity, profitability, and activity. We use these measures to test our hypotheses. Choosing other sets of variables from prior research does not qualitatively change our results.

Panel B of Table 2 presents additional information about our sample of bankrupt firms. Most of the firms in our sample filed for Chapter 11 bankruptcy either in Delaware (37%) or in the Southern District of New York (17%). Legal scholars have debated whether Delaware and the Southern District of New York courts have different outcomes from other courts.[6] We include these data because we test for the possibility that Delaware or the Southern District of New York bankruptcy filings have different characteristics than filings in other districts. The industry with the highest number of filers in our sample is the telecommunications industry, representing 14% of our sample. In order to control for industry effects, we follow examples from prior research (e.g. Dahiya et al. (2003)) and we isolate the industry with the highest number of bankrupt firms in the sample. The sample also includes 35 prepackaged bankruptcy cases (10% of the sample). Because prepackaged bankruptcies have different characteristics from other cases, we distinguish between prepackaged bankruptcies and other cases.[7]

Panel C of Table 2 shows the number of bankruptcy filings over time. These filings follow a pattern similar to that of bond default rates found by Altman et al. (2005); the pattern is also consistent with the economic downturn at the turn of the century. The highest number of bankruptcy filings occurred in years 2000 (47), 2001 (88) and 2002 (66), just prior to, during, and just after the burst of the so called internet bubble. The trend in the number of filings is the same for the full sample of 827 firms, as for the reduced sample.

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[5] This literature begins with Beaver (1966) and Altman (1968) who use discriminant analysis. Ohlson (1980) and Zmijewski (1984) extended this work with logit and probit models. More recent work includes Begley et al.(1996) and Shumway (2001).

[6] For a review of the debate and literature see LoPucki (2006); compare Chang and Schoar (2007) (identifying bias among bankruptcy judges).

[7] For an analysis of prepackaged bankruptcies, see Tashjian et al. (1996).

B. Regression Models

To isolate the time trend in financial and economic variables of firms filing for bankruptcy we estimate the following regression (OLS) models:

$$\text{Leverage} = \alpha_1 \text{ Size} + \alpha_2 \text{ Time Trend} + \alpha_3 \text{ ROA} + \alpha_4 \text{ Telecom Dummy} + \alpha_5 \text{ CA/TA} + \alpha_6 \text{ PP\&E/TA} + \alpha_7 \text{ Delaware} + \alpha_8 \text{ New York} + \alpha_9 \text{ Prepackaged} + \alpha_{10} \text{ Constant} + \varepsilon \quad \text{(Eq 1)}$$

$$\text{STA} = \alpha_1 \text{ Size} + \alpha_2 \text{ Time Trend} + \alpha_3 \text{ Telecom Dummy} + \alpha_4 \text{ Delaware} + \alpha_5 \text{ New York} + \alpha_6 \text{ Prepackaged} + \alpha_7 \text{ Working Capital} + \alpha_8 \text{ Constant} + \varepsilon \quad \text{(Eq 2)}$$

$$\text{2-Year ROA} = \alpha_1 \text{ Size} + \alpha_2 \text{ Time Trend} + \alpha_3 \text{ Telecom Dummy} + \alpha_4 \text{ Delaware} + \alpha_5 \text{ New York} + \alpha_6 \text{ Prepackaged} + \alpha_7 \text{ Constant} + \varepsilon \quad \text{(Eq 3)}$$

$$\text{WCTA} = \alpha_1 \text{ Size} + \alpha_2 \text{ Time Trend} + \alpha_3 \text{ ROA} + \alpha_4 \text{ Telecom Dummy} + \alpha_5 \text{ Delaware} + \alpha_6 \text{ New York} + \alpha_7 \text{ Prepackaged} + \alpha_8 \text{ Constant} + \varepsilon \quad \text{(Eq 4)}$$

$$\text{SecDebt} = \alpha_1 \text{ Size} + \alpha_2 \text{ Time Trend} + + \alpha_3 \text{ Telecom Dummy} + \alpha_4 \text{ CA/TA} + \alpha_5 \text{ Delaware} + \alpha_6 \text{ New York} + \alpha_7 \text{ Prepackaged} + \alpha_8 \text{ Leverage} + \alpha_9 \text{ Constant} + \varepsilon \quad \text{(Eq 5)}$$

The dependent variable in regression Eq. (1) is Leverage as defined above. The explanatory variables include: a time trend which ranges from 1 to 12, representing the year of bankruptcy, starting with 1993; a profitability variable: and other variables defined in prior literature as determinants of leverage.[8] If firms are increasingly filing for bankruptcy later (delaying the filing and incurring additional debt or losses prior to the filing) over time, we expect an increase in leverage over time and a positive coefficient associated with the time trend variable. We measure past profitability by return on assets (ROA). Other variables are firm size (log of inflation adjusted total assets[9]), the current assets ratio (CA/TA), the PP&E ratio (PPE/TA) and a Telecom Dummy is used as an industry control (equalling one if firm belongs to the telecom industry and zero otherwise).[10] According to Rajan and Zingales (1995) larger firms should have higher leverage because they have less volatile cash flows and are less likely to become financially distressed. Firms with higher losses in the pre-bankruptcy period should have higher leverage at filing. Firms with higher PP&E should have a higher level of leverage.[11] We control for three bankruptcy specific variables by including dummies for Delaware and the Southern District of New York bankruptcy filings and Prepackaged bankruptcy filings. The Delaware (New York) dummy takes a value of one if the bankruptcy was filed in Delaware (New York) and zero otherwise. Likewise, the Prepackaged dummy takes a value of one if the bankruptcy was filed as a prepackaged, and zero otherwise. According to Ayotte and Skeel (2004) firms filing in Delaware are larger and have a higher leverage.

In the second regression Eq (2), the dependent variable is sales turnover (STA). The independent variables are size, time trend, and the bankruptcy specific control variables. We expect the time

[8] See Rajan and Zingales (1995); Hovakimian et al. (2001); Hovakamian et al. (2004).

[9] Using the log of inflation-adjusted sales instead does not change our results qualitatively.

[10] We tested other industries in our sample together with the telecom industry or separately and found no change in our findings.

[11] See Titman and Wessel (1988).

trend variable to have a negative coefficient. A firm filing later should have a lower level of activity compared to a firm filing earlier. We also expect size to have a negative impact and working capital to have a positive impact on the activity ratio.

As noted above, the continuous stream of losses for firms in our sample averages 6 quarters. In order to capture this effect, we estimate regression Eq (3) with a 2-year ROA as a dependent variable. The independent variables are size, the time trend and the bankruptcy specific variables. If firms are increasingly destroying value in the pre-bankruptcy period by delaying the filing, the coefficient associated with the time trend should be negative. Our results remain qualitatively unchanged when we run a robustness check by replacing the 2-year ROA with operating income/assets ratio (these results are not reported).

The forth regression model (Eq 4) uses a proxy for liquidity (working capital scaled by total assets) as a dependent variable. The independent variables are size, profitability (ROA) and the bankruptcy specific variables. If firms are delaying filing for bankruptcy, the coefficient associated with the time trend should be negative, as firms would burn through more of their working capital before filing. We expect higher working capital to be associated with larger firms, and those firms with higher ROA.

Next, for Eq(5), we estimate a regression model for secured debt. Secured debt is defined as the ratio of secured debt to total liabilities. Independent variables in the model include size, a time trend, leverage, the current assets ratio, a telecom dummy, and the bankruptcy specific variables. If financially distressed debtors increasingly use secured credit to delay bankruptcy, the coefficient associated with the time trend variable should be positive. We expect current assets to have a negative association with secured debt since the non-current assets are generally used as collateral (hence a higher percentage of secured debt is likely to be present when PPE represent a higher percentage of total assets). Prior research indicates higher percentages of leverage are associated with higher levels of secured debt.[12] The first empirical model of the secured debt was developed by Barclay and Smith (1995). Their model primarily uses market variables to explain the level of secured debt. By contrast, we rely mostly on accounting measures as explanatory variables because our sample consists of bankrupt firms in the pre-filing period where the market values of firms are highly volatile. The Barclay and Smith (1995) model includes a regulation dummy. Only one firm in our sample belongs to a regulated industry and including this variable does not alter our findings

C. Main Results

The results of our analysis are presented in Table 3. Column one (Leverage) shows the estimated coefficients from our Eq(1) model for leverage. A statistically significant and positive coefficient associated with the time trend variable supports our hypothesis that over time firms file for bankruptcy in worse financial condition. The results also indicate a greater percentage of leverage is associated with smaller firms and a lower return on assets for the bankrupt firm sample. Although for nonbankrupt firms, Rajan and Zingales (1995), Hovakimian et al. (2001) and Hovakamian et al. (2004) find a positive coefficient, we find a negative coefficient associated with size in our sample of bankrupt firms. It appears higher leverage is associated with smaller firms in the cross section of bankrupt firms. The coefficients associated with the telecom dummy, the current assets ratio, the PP&E ratio, and the Delaware and Southern District of New York dummy variables are not statistically significant. Consistent with Ayotte and Skeel (2004), we find that leverage is higher in prepackaged bankruptcy cases.

Column two of Table 3 (Sales Turnover) shows the estimated coefficients from the Eq(2) model. The time trend coefficient is negative, as predicted, and statistically significant (at the 10% significance level). Sales turnover appears to be negatively associated with the size and industry.

[12] See Berger and Udell (1990); Morellec (2001).

Neither the bankruptcy specific variables nor the working capital ratio seem to have any impact on the sales turnover in the bankrupt firm sample.

Column three of Table 3 (2-year ROA) shows the determinants from the Eq(3) model for ROA in the two year period preceding the bankruptcy filing. A negative and statistically significant coefficient associated with the time trend variable implies firms have been generating higher losses in more recent years. This is consistent with firms increasingly filing later over time and with the delay reducing firm value. These results are consistent with our predictions. The results also indicate that larger firms experience higher ROA (lower losses)[13]. Firms from the telecom industry experienced higher losses than their non-telecom counterparts. The coefficients associated with bankruptcy specific variables are not statistically significant.

For Eq(4), the working capital determinants are shown in column 4 of Table 3. A negative and statistically significant coefficient associated with the time trend variable indicates that the level of working capital in firms filing for bankruptcy has decreased over the 1993-2004 sample period, as predicted. In addition, the results indicate that larger and more profitable firms have a higher level of working capital. This finding is consistent with our findings for leverage, sales turnover, and ROA. Our results also suggest that prepackaged bankruptcy cases are associated with lower working capital than their non-prepackaged counterparts.

For Eq(5), the last column of Table 3 shows the determinants of secured debt in the bankruptcy firm sample. A positive and statistically significant coefficient associated with the time trend variable indicates an increase over time in pre-bankruptcy secured credit. This is consistent with our prediction that an increasingly hard landing in bankruptcy leads debtors to delay bankruptcy and to finance such delay with secured credit. Our results also indicate that larger firms and those with higher current assets have a lower portion of secured debt in their liabilities. Contrary to what was suggested in the literature for all firms,[14] our results show a negative relationship between leverage and secured debt in the bankrupt firm sample.

Overall, the results from Table 3 document the deterioration in the financial and economic condition of bankrupt firms over the 1993-2004 time period. These data are consistent with a delay in bankruptcy filings, financed by secured credit, and the destruction of value as a consequence. Taken together, these results fully support our hypotheses.

D. Robustness

We hypothesize that a change in bankruptcy practice over time has yielded delay in bankruptcy filing and deterioration in the financial and economic condition of bankrupt firms. One might wonder whether a shift in general or industry wide conditions might instead explain our results. We are not persuaded that this is a theoretically sound conjecture. A change in broad financial or economic conditions might affect the number of firms driven toward bankruptcy, but should not independently alter the point at which a firm so driven pulls the trigger and files a petition. Thus, even if a general downturn caused many firms in an industry to suffer unusual financial and economic setbacks, this alone would not explain why debtors increasingly suffer such losses outside of bankruptcy. Similarly, even if firms in an industry generally took on more secured credit, this alone would not explain why financially distressed debtors joined the trend rather than file a bankruptcy petition at an earlier point of financial distress. In each case, a hard landing for management and equity provides a supplemental explanation.

Nevertheless, in the spirit of conservatism, we adjust our dependent variables from the Eq(1)-Eq(5) models by their respective industry medians calculated for the bankrupt data fiscal year; this is

[13] 298 firms (of 342 in our sample) experienced a negative ROA in the 2-year period preceding bankruptcy filing.

[14] See Berger and Udell (1990).

designed to account for the time trend in non-bankrupt firms over the sample period.[15] Industry Adjusted variables are equal to the difference between the firm's ratio and the industry median. Because the adjustments control for both industry effects and the time trend of non-bankrupt firms, we exclude the telecom dummy from the regression models. Table 4 shows the regressions on the industry adjusted ratios. Our finding are unchanged for leverage, the 2-year ROA, working capital, and secured debt. The time trend coefficient in these four regressions has the predicted sign and is statistically significant. In the sales turnover regression model, however, the coefficient associated with the time trend is not statistically significant, indicating that there is no change in activity over the sample period. Overall the results for the industry adjusted financial ratios support the findings from Table 3.

The same can be said for our results when we control for prevailing market interest rate. We estimate Eq(1)-Eq(5) with an additional independent variable for the United States prime rate. In each case (not reported here), the time trend variable retains the predicted sign and remains significant. When we estimate the same equations using industry-adjusted dependent variables (also not reported), again the time-trend variables are unchanged, with the exception that time trend is no longer significant as a predictor for secured credit (though it retains the predicted sign). For reasons described above, we do not see this as inconsistent with our hypothesis. Moreover, as we explain more fully below, we do not find a general increase in leverage or secured credit across firms in the economy (including financially sound firms). Thus, we do not suspect that changes in interest rate, as opposed to the increasingly hard landing, are responsible for the deteriorating balance sheets of financially distressed firms. In any case, again, overall results support the findings from Table 3.

As an additional robustness check, we consider alternative measures of key variables. As noted above, prior research has identified alternative explanatory variables for leverage and secured debt. There are also alternative measures of leverage itself and additional explanatory variables that might be considered. We estimate additional regression models to account for the impact of different variables.

We estimate the model from Eq(1) for leverage, but this time we add the market-to-book ratio (market value of equity scaled by book value of equity) as an explanatory variable. Because the market-to-book ratio was not available for all firms in our sample, this reduces our sample to 293 firms. We repeat the regression for the industry adjusted leverage. These two regressions are shown in columns one and two of Table 5 Panel A. The market-to-book ratio is negatively associated with leverage in our sample. This is consistent with Rajan and Zingales (1995), Hovakimian et al. (2001), and Hovakamian et al. (2004). Our findings on the time trend variable remain unchanged, with the time trend coefficients remaining positive and statistically significant in both regression models. All other variables are unchanged compared to the results from Tables 3 and 4.

Next we estimate new regression models for secured debt and industry-adjusted secured debt. In addition to the independent variables used in Eq(5), these new models include the market-to-book ratio and the PP&E ratio.[16] Results of these two regressions are presented in columns three and four, respectively, of Table 5 Panel A. The coefficients associated with the market-to-book ratio and the PP&E ratio are not statistically significant in either regression, while the coefficient associated with the time trend remains positive and statistically significant. In column 5 we show results for the secured debt regression where we replace the current assets ratio with the working capital ratio. The leverage coefficient becomes statistically insignificant while the coefficient associated with the working capital variable is positive and statistically significant. The coefficient associated with the

[15] We also ran these regressions after adjusting both the dependent and, where applicable, independent variables for industry means, and with no dependent or independent variable adjusted but with industry median for the year as an additional control variable. The results, which are not reported, were not qualitatively different.

[16] Including these two variables separately does not alter our findings. These results are, however, omitted from presentation.

time trend variable remains positive and statistically significant. In addition to the presented results on secured debt, we also estimate models of sales turnover, 2-year ROA and working capital/TA ratios with additional explanatory variables including PP&E/TA and market-to-book. The results are qualitatively unchanged.

We also estimate two regression models with market leverage as the dependent variable. The first model includes only those independent variables from Eq(1); the second includes the same variables plus a market-to-book ratio. The coefficient associated with the time trend is positive and statistically significant in both estimated models presented in Table 5 Panel B. The coefficients associated with the Telecom Dummy and PP&E/TA are also statistically significant, indicating the market leverage is lower for telecom firms, and higher for firms with more fixed assets. Additionally, two of the bankruptcy specific variables are statistically significant and positive. The results indicate firms filing in the Southern District of New York and firms filing prepackaged Chapter 11 cases have higher leverage. The Market-to-Book ratio is negatively correlated with the market leverage.

We next address the possibility of a censored sample bias. At the time of bankruptcy filing, firms are now weaker than in the past. We attribute this to added delay financed by secured credit. Alternatively, there may be no added delay or increase in secured credit, but rather bankruptcy is increasingly avoided by the relatively stronger distressed firms.[17] Without more, if firms in better financial and economic condition opt out of bankruptcy, all else equal, we would observe a deterioration in the financial and economic indicators of firms filing for bankruptcy. To account for this possibility, we examine a sample comprised of only the financially weakest firms in each year of our sample period. A negative trend in the financial and economic indicators for these firms would suggest that our results are not driven by a higher incidence of the financially stronger firms opting out of bankruptcy. For each year in our sample period, we rank firms by the ex ante probability of bankruptcy computed using the Begley et al. (1996) bankruptcy prediction model.[18] Effectively, this model provides a reasonable proxy for the financial condition of firms at the time of bankruptcy filing. We take the three firms with the lowest probability of bankruptcy in each year to create a sub-sample of 36 weak firms (approximately 10% of our sample). This gives us an unbiased sample of firms unaffected by any increasing tendency of cherry picking to keep the best firms out of bankruptcy.

For this subsample, we estimate the regression models Eq(1)-Eq(5) for industry adjusted dependent variables. Table 6 provides the results of this analysis. The coefficients associated with the time trend in the first column (leverage) and the last column (secured debt) are positive and statistically significant, while the coefficients of the time trend in the ROA and working capital regressions are negative and statistically significant. These results have the same predicted sign as the coefficients in Tables 3 and 4. This result is further supported by our (unreported) estimate of additional regressions on the same sub-sample of 36 firms (for non-adjusted dependent variables, with additional explanatory variables, and with market leverage instead of book leverage), where our results remain qualitatively unchanged. Thus, despite the small sample size, and low F statistic (which limits explanatory power), our results do not seem a mere artefact of a censored sample.

We also construct a sample of all US firms with characteristics similar to our bankrupt sample. We start with all firms in the Compustat database, isolate the 1993-2004 period, and exclude all firms with two-digit SIC codes from 60-69. We further exclude firms with inflation adjusted liabilities of less than $100 million. For each year in the sample period, we rank firms by their market return, and divide them into deciles. We treat firms in the lowest decile as distressed and other firms as non-distressed. We run all our regression models (without the bankruptcy specific variables) together with robustness checks on these two sub-samples, and find results consistent with the

[17] Compare Asquith et al. (1994), which analyzes bankruptcy avoidance techniques.

[18] We use Begley et al. (1996) with correct coefficients as reported by Shumway (2001).

results presented in tables 3-6. Namely, while non-distressed firms present unchanged or better financial and economic conditions, the distressed sub-sample exhibits a clear deterioration in financial ratios and economic condition. That is, just as predicted by our model, the weakest firms outside of bankruptcy are weaker now than in the past, and more extensively encumbered. We repeat this analysis for firms of all sizes. These results (which are not reported) are unchanged.

Finally, we entertain the possibility that our results are driven by the supply of secured credit rather than the demand. As noted above in the introduction, a potentially significant change in the Uniform Commercial Code (UCC) occurred during our sample period. In July 2001, almost all US jurisdictions enacted UCC §9-104(h), which newly permitted a lender to take a security interest in a debtor's bank accounts. The availability of this new collateral can be expected to have lowered a debtor's minimum cost for a new loan and could have thus induced a delay in bankruptcy filings. And our results are consistent with an increasing availability of secured credit over time even if the debtors' desire to finance delay remained unchanged throughout our sample period. We are skeptical, however, that the new UCC provision or any change in the availability of secured credit explains our results. The availability of bank accounts as collateral is not necessarily important enough significantly to affect the cost of a distressed debtor's secured loan. More generally, while one might imagine other reasons for the increased availability of secured debt over time, the technique of even large-scale secured credit was already well established by the beginning of our sample period. Nonetheless, to account for the possibility that we underestimate the significance of UCC §9-104(h), we replace the time trend variable in Eq(1)-Eq(5) with a binary variable representing pre- and post-2001 periods. The (unreported) results are consistent with our findings for time trend as reported in Tables 3-6. We have not tested for other possible supply-side developments, but we are agnostic on whether any change in the supply of finance may be responsible for our results. We show increasing deterioration and encumbrance of debtors at the time of bankruptcy filing and attribute this to a delay in filing. The importance of these observations is undiminished by the possibility that the phenomena we document are generated by a change in supply rather than a change in demand.

V. Conclusion and Policy Implications

There is a "dark side" to strong creditors' rights in bankruptcy. This is the conclusion reached by Acharya et al. (2008), which describes how anticipation of a hard landing for managers and shareholders leads firms to enter potentially inefficient diversifying mergers as an insolvency avoidance technique. Our findings here are complementary. Managers who fear demise may too aggressively shun risk to avoid insolvency. But when insolvency (or near insolvency) occurs anyway, the same managers, with nothing to lose, may accept too much risk. Additionally, to finance a last-ditch effort at salvation, managers may offer any asset as collateral and cede control of the firm.

As noted above in the introduction, it is difficult to be definitive here. Our analysis supports the hypothesis that strict adherence to absolute priority causes debtors to delay bankruptcy and to waste assets in the process. Our data, however, do not directly address whether this delay and waste is justified by the savings from temporary or sometimes permanent avoidance of bankruptcy. That is, if bankruptcy is costly, the delay of avoidance of bankruptcy, even for a distressed firm, may be justified. Bankruptcy is costly and its delay or avoidance may be justified by the delay or avoidance of the cost.[19] So while bankruptcy may occur later now than in the past, our data do not tell us whether bankruptcy happens too late now or perhaps too early before.

Still, like Acharya and his co-authors, we are willing to speculate. Even prior to the start of our sample period, in 1993, the bankruptcy return to managers and equity was small. Managers today routinely lose their jobs, but even in the past they more often than not failed to survive the

[19] For simplicity, our model ignores the time-value factor. But this is, of course, a real-world concern.

bankruptcy process.[20] Equity may now ordinarily expect a return of zero, but in the past equity's return from an insolvent debtor was rarely more than a small fraction of the firm's value.[21] Moreover, managers likely have always suffered a loss in reputation after leading a firm into bankruptcy. So while bankruptcy may have been a management tool in some early cases, we suspect that bankruptcy was unattractive even at its height of desirability.

Additionally, in terms of bankruptcy cost, despite some high-profile examples, we do not generally see firms dissolving in a solution of legal and accounting fees. Bris et al. (2006) describes bankruptcy transactions costs as varied, not routinely high as some had assumed. This said, if bankruptcy's *in*direct costs were significant, these would have to be considered as well. For example, Ayotte and Morrison have suggested that, under some circumstances, secured creditors in control of the bankruptcy process have a bias in favor of liquidation. But, like us, Ayotte and Morrison lack an independent measure of efficiency—so more liquidation may not be too much. Thus, it seems a reasonable conjecture that debtors have always shied away from bankruptcy and its potential to correct investment decisions even where the costs of bankruptcy are justified. If this is so, the trend towards more delay is an exacerbation of a problem rather than the mitigation of one.

This raises a policy question. If bankruptcy's hard landing induces wasteful delay, what should be the regulatory response? We do not recommend softening the landing. Anticipation of absolute priority violations can worsen ex ante investment incentives, yielding too much risk in anticipation of insolvency, even while anticipation of such violations reduces post-insolvency risk incentives. That is, as suggested by Adler (1992) and Bebchuk (2002), ex ante risk reduction may well be a "light," rather than "dark," side of a hard landing, Acharya et al. notwithstanding.[22] A soft landing, then, could increase the cost of capital. A potentially better solution, as suggested by Adler (1998), would be to raise the cost of loans to an insolvent debtor by denying the lender priority or early maturity and thus eliminate or reduce the trade-off between pre- and post-insolvency investment incentives.[23] Such a rule would not necessarily be wise. As we have said, the available evidence makes it is difficult to be definitive. The results reported here provide a piece in a still unsolved puzzle.

[20] See, e.g., Ayotte and Morrison (2007).

[21] See, e.g. Capkun and Weiss (2007).

[22] Compare Povel (1999).

[23] This rule, moreover, would be potentially beneficial even under supply-side, rather than a demand-side, explanation of our results. The distinction between these explanations is described above in our discussion of robustness.

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Table 1. Sample Selection

The sample selection process begins with Edward Altman's bankruptcy database covering the 1993-2004 time period. Financial information was collected from the Compustat database, information about the type of bankruptcy filing and the filing venue was collected from the Pacer database and Lynn LoPucki's Bankruptcy Research database. The initial sample is the original sample from Edward Altman's bankruptcy database. The reduced sample is the sample of non-financial firms for which financial information was available in the Compustat database. The calibrated sample is the sample of firms for which all information was available.

	N	Description
Initial Sample	827	Altman's bankruptcy database
Reduced Sample	440	Non-Financial, Compustat financial data
Calibrated Sample	342	Financial Data, Prepack, Filing Venue
Final Sample	342	All data

Table 2. Descriptive statistics

Descriptive statistics on the sample of 342 firms that filed for Chapter 11 bankruptcy in the 1993-2004 time period. The sample was collected from Edward Altman's bankruptcy database. Financial information was collected from the Compustat database. All other information was collected from the Pacer database and from the Lynn LoPucki's Bankruptcy Research database. Leverage is the ratio of total assets to total liabilities. Sales turnover is the ratio of sales to total assets. One and Two Year Return on Assets (ROA) is computed as Income before extraordinary item divided by total assets for one and two years preceding the bankruptcy filing respectively. Working Capital/TA is the ratio of working capital to total assets. Current Assets/TA is the ratio of current assets to total assets. Secured Debt/TL is the ratio of Secured debt to total liabilities. PP&E/TA is the ratio of net property, plant and equipment to total assets. Market Leverage is the ratio of total liabilities to the sum of the market value of equity plus total liabilities. Market-to-Book is the ratio of the market to the book value of equity. Delaware indicates the bankruptcy was filed in the Delaware bankruptcy court. New York indicates the bankruptcy was filed in the Southern District of New York. Telecom indicates the firm belongs to the telecommunications industry. Prepacks indicates the bankruptcy was filed prepackaged. Filing Year represents the calendar year of the bankruptcy filing.

Panel A

	N	Mean	Min	Mdn	Max
Assets ($ millions)	342	1279.24	32.74	389.31	100000.00
Liabilities ($ millions)	342	1025.68	49.55	359.91	45984.00
Leverage	342	1.07	0.10	0.92	3.49
Sales Turnover	342	1.19	0.01	1.07	7.82
One Year ROA	342	-0.28	-3.53	-0.13	0.06
Two Year ROA	342	-0.37	-8.49	-0.20	0.13
Working Capital/TA	342	-0.18	-3.15	0.00	0.74
Current Assets/TA	342	0.38	0.02	0.36	0.86
Secured Debt/TL	342	0.25	0.00	0.19	0.89
PP&E/TA	342	0.37	0.01	0.34	0.96
Market Leverage	293	0.83	0.01	0.90	1.00
Market-to-Book	293	0.77	-47.82	0.24	31.23

Panel B

	N	N of cases=1	% of cases=1
Delaware	342	128	37.43%
New York	342	57	16.67%
Telecom	342	49	14.33%
Prepacks	342	35	10.23%

Panel C

Filing Year	N	%
1993	6	1.75%
1994	9	2.63%
1995	7	2.05%
1996	13	3.80%
1997	12	3.51%
1998	15	4.39%
1999	30	8.77%
2000	47	13.74%
2001	82	23.98%
2002	66	19.30%
2003	41	11.99%
January-March 2004	14	4.09%
All Years	342	100.00%

Table 3 - Changes in financial variables over time

Five regression models on the sample of 342 firms that filed for Chapter 11 bankruptcy in the 1993-2004 time period. The sample was collected from Edward Altman's bankruptcy database. Financial information was collected from the Compustat database. All other information was collected from the Pacer database and from the Lynn LoPucki's Bankruptcy Research database. Leverage is the ratio of total assets to total liabilities. Sales turnover is the ratio of sales to total assets. One and Two Year Return on Assets (ROA) is computed as Income before extraordinary items divided by total assets for one and two years preceding the bankruptcy filing respectively. Working Capital/TA is the ratio of working capital to total assets. Current Assets/TA is the ratio of current assets to total assets. Secured Debt/TL is the ratio of Secured debt to total liabilities. PP&E/TA is the ratio of net property, plant and equipment to total assets. Delaware indicates the bankruptcy was filed in Delaware bankruptcy court. New York indicates the bankruptcy was filed in the Southern District of New York. Telecom indicates the firm belongs to the telecommunications industry. Prepacks indicates the bankruptcy was filed as prepackaged. Time trend is the difference between the year of filing and 1992. ***, **, * represent significance at the 1%, 5% and 10% levels respectively.

	Leverage	Sales Turnover	2-year ROA	Working Capital/TA	Secured Debt/TL
Size	-0.097***	-0.155***	0.147***	0.050*	-0.027**
	(3.316)	(3.863)	(3.319)	(1.665)	(2.320)
Time Trend	0.016**	-0.036*	-0.033**	-0.024***	0.011**
	(2.142)	(1.958)	(2.228)	(2.665)	(2.204)
One Year ROA	-0.579***			0.505***	
	(4.648)			(3.942)	
Telecom Dummy	-0.009	-0.746***	-0.442***	0.070	-0.106***
	(0.118)	(8.253)	(2.601)	(0.776)	(3.138)
Current Assets/TA	0.029				-0.218***
	(0.188)				(3.298)
PP&E/TA	0.071				
	(0.568)				
Delaware Dummy	0.043	-0.019	0.006	-0.056	-0.019
	(0.928)	(0.197)	(0.101)	(0.953)	(0.680)
New York Dummy	0.062	0.038	-0.253	-0.071	-0.005
	(0.853)	(0.313)	(1.503)	(0.812)	(0.135)
Prepack Dummy	0.358***	0.123	-0.261	-0.402***	0.026
	(3.744)	(0.816)	(1.308)	(3.143)	(0.558)
Working Capital/TA		0.037			
		(0.544)			
Leverage					-0.076***
					(3.055)
Constant	1.190***	2.417***	-0.749***	-0.040	0.486***
	(6.032)	(8.960)	(3.874)	(0.221)	(4.950)
N	342	342	342	342	342
F	15.329	20.628	4.037	6.155	4.259
Prob>F	0.000	0.000	0.001	0.000	0.000
R-squared	43.60%	17.00%	12.60%	26.70%	8.20%

Table 4 – Changes in Industry adjusted financial variables over time

Five regression models on the sample of 342 firms that filed for Chapter 11 bankruptcy in the 1993-2004 time period. The sample was collected from Edward Altman's bankruptcy database. Financial information was collected from the Compustat database. All other information was collected from the Pacer database and from the Lynn LoPucki's Bankruptcy Research database. All dependent variables are industry median adjusted equal to the difference between the bankrupt firm's variable and the industry median for the respective year. Leverage is the ratio of total assets to total liabilities. Sales turnover is the ratio of sales to total assets. One and Two Year Return on Assets (ROA) is computed as Income before extraordinary items divided by total assets for one and two years preceding the bankruptcy filing respectively. Working Capital/TA is the ratio of working capital to total assets. Current Assets/TA is the ratio of current assets to total assets. Secured Debt/TL is the ratio of Secured debt to total liabilities. PP&E/TA is the ratio of net property, plant and equipment to total assets. Delaware indicates the bankruptcy was filed in Delaware bankruptcy court. New York indicates the bankruptcy was filed in the Southern District of New York. Telecom indicates the firm belongs to the telecommunications industry. Prepacks indicates the bankruptcy was filed as prepackaged. Time trend is the difference between the year of filing and 1992. ***, **, * represent significance at the 1%, 5% and 10% levels respectively.

	Leverage	Sales Turnover	2-year ROA	Working Capital/TA	Secured Debt/TL
Size	-0.098***	-0.095***	0.135***	0.076***	-0.032***
	(3.761)	(2.999)	(3.499)	(2.796)	(2.852)
Time Trend	0.020**	0.004	-0.035**	-0.018**	0.015***
	(2.525)	(0.244)	(2.100)	(1.977)	(2.898)
One Year ROA	-0.598***			0.485***	
	(5.356)			(4.032)	
Current Assets/TA	0.102				-0.064
	(0.669)				(0.922)
PP&E/TA	-0.011				
	(0.087)				
Delaware Dummy	0.026	-0.037	-0.029	-0.049	-0.025
	(0.535)	(0.464)	(0.516)	(0.852)	(0.865)
New York Dummy	0.074	-0.022	-0.275	-0.122	-0.005
	(1.036)	(0.236)	(1.541)	(1.440)	(0.130)
Prepack Dummy	0.371***	0.121	-0.210	-0.394***	0.066
	(3.734)	(0.908)	(1.055)	(3.093)	(1.339)
Working Capital/TA		-0.186***			
		(3.157)			
Leverage					-0.101***
					(3.883)
Constant	0.576***	0.591***	-0.768***	-0.375**	0.375***
	(3.031)	(2.773)	(4.480)	(2.303)	(3.883)
N	342	342	342	342	342
F	15.747	4.319	4.573	7.474	3.361
Prob>F	0.000	0.000	0.000	0.000	0.002
R-squared	45.00%	6.90%	8.40%	27.10%	6.40%

Table 5 – Changes in financial variables – Models with market variables

Panel A

Five regression models on the sample of 342 firms that filed for Chapter 11 bankruptcy in the 1993-2004 period. The sample was collected from Edward Altman's bankruptcy database. Financial information was collected from the Compustat database. All other information was collected from the Pacer database and from the Lynn LoPucki's Bankruptcy Research database. Leverage-Adj and Secured Debt-Adj are industry median adjusted equal to the difference between the bankrupt firm's variable and industry median for the respective year. Sales turnover is the ratio of sales to total assets. Leverage is the ratio of total assets to total liabilities. One and Two Year Return on Assets (ROA) is computed as Income before extraordinary items divided by total assets for one and two years preceding the bankruptcy filing respectively. Working Capital/TA is the ratio of working capital to total assets. Current Assets/TA is the ratio of current assets to total assets. Secured Debt/TL is the ratio of Secured debt to total liabilities. PP&E/TA is the ratio of net property, plant and equipment to total assets. Market Leverage is the ratio of total liabilities to the sum of market value of equity plus total liabilities. Market-to-Book is the ratio of the market to the book value of equity. Delaware indicates the bankruptcy was filed in Delaware bankruptcy court. New York indicates the bankruptcy was filed in the Southern District of New York. Telecom indicates the firm belongs to the telecommunications industry. Prepacks indicates the bankruptcy was filed as prepackaged. Time trend is the difference between the year of filing and 1992. ***, **, * represent significance at the 1%, 5% and 10% levels respectively.

	Leverage	Leverage-Adj	Secured Debt	Secured Debt-Adj	Secured Debt-Adj
Size	-0.101***	-0.104***	-0.019	-0.025*	-0.023**
	(3.138)	(3.547)	(1.447)	(1.912)	(1.987)
Time Trend	0.015**	0.020**	0.011*	0.015***	0.018***
	(2.026)	(2.540)	(1.863)	(2.606)	(3.142)
Market-to-Book	-0.011**	-0.009**	-0.003	-0.003	-0.003
	(2.570)	(2.041)	(1.396)	(1.556)	(1.296)
One Year ROA	-0.557***	-0.575***			
	(4.480)	(5.194)			
Telecom Dummy	-0.020		-0.108***		
	(0.277)		(2.793)		
Current Assets/TA	-0.044	0.032	-0.151	-0.052	
	(0.272)	(0.200)	(1.610)	(0.526)	
PP&E/TA	0.077	-0.001	0.025	-0.057	-0.006
	(0.567)	(0.004)	(0.317)	(0.687)	(0.088)
Delaware Dummy	0.066	0.048	-0.032	-0.044	-0.039
	(1.350)	(0.971)	(1.031)	(1.401)	(1.241)
New York Dummy	0.101	0.118	-0.006	-0.016	-0.012
	(1.394)	(1.643)	(0.150)	(0.399)	(0.312)
Prepack Dummy	0.301**	0.305**	0.038	0.074	0.089
	(2.547)	(2.512)	(0.618)	(1.133)	(1.399)
Leverage			-0.072**	-0.103***	0.005
			(2.582)	(3.461)	(0.122)
Working Capital/TA					0.128***
					(3.221)
Constant	1.224***	0.602***	0.415***	0.360***	0.197**
	(5.592)	(2.864)	(3.245)	(2.740)	(2.187)
N	293	293	293	293	293
F	14.078	13.707	2.398	2.157	3.198
Prob>F	0.000	0.000	0.010	0.025	0.001
R-squared	45.40%	46.30%	7.10%	6.80%	10.30%

Panel B

	Mkt leverage	Mkt leverage
Size	-0.015	-0.016
	(1.327)	(1.478)
Time Trend	0.015***	0.016***
	(4.023)	(4.273)
Market-to-Book		-0.009*
		(1.967)
One Year ROA	-0.042	-0.036
	(1.177)	(1.042)
Telecom Dummy	-0.117***	-0.114***
	(2.854)	(2.906)
Current Assets/TA	-0.012	-0.009
	(0.172)	(0.143)
PP&E/TA	0.172***	0.174***
	(2.988)	(3.098)
Delaware Dummy	0.023	0.014
	(0.927)	(0.580)
New York Dummy	0.065**	0.057**
	(2.259)	(2.043)
Prepack Dummy	0.111***	0.108***
	(5.290)	(5.361)
Constant	0.698***	0.709***
	(8.293)	(8.830)
Number of observations	293	293
F	9.634	9.911
Prob>F	0.000	0.000
R-squared	16.00%	21.10%

Table 6 - Changes of Industry adjusted financial variables over time – the bottom 10% of the bankrupt firm sample

Five regression models on the sample of 36 firms that filed for Chapter 11 bankruptcy in the 1993-2004 period. The sample was collected from Edward Altman's bankruptcy database. Financial information was collected from the Compustat database. All other information was collected from the Pacer database and from the Lynn LoPucki's Bankruptcy Research database. The sample of 36 firms represents three firms per year in the worst financial condition. All dependent variables are industry median adjusted equal to the difference between the bankrupt firm's variable and industry median for the respective year. Leverage is the ratio of total assets to total liabilities. Sales turnover is the ratio of sales to total assets. One and Two Year Return on Assets (ROA) is computed as Income before extraordinary items divided by total assets for one and two years preceding the bankruptcy filing respectively. Working Capital/TA is the ratio of working capital to total assets. Current Assets/TA is the ratio of current assets to total assets. Secured Debt/TL is the ratio of Secured debt to total liabilities. PP&E/TA is the ratio of net property, plant and equipment to total assets. Delaware indicates the bankruptcy was filed in Delaware bankruptcy court. New York indicates the bankruptcy was filed in the Southern District of New York. Telecom indicates the firm belongs to the telecommunications industry. Prepacks indicates the bankruptcy was filed as prepackaged. Time trend is the difference between the year of filing and 1992. ***, **, * represent significance at the 1%, 5% and 10% levels respectively.

	Leverage	Sales Turnover	2-year ROA	Working Capital	Secured Debt
Size	-0.509***	-0.183	0.391*	0.444***	-0.092*
	(5.156)	(1.085)	(1.833)	(4.018)	(1.796)
Time Trend	0.064*	0.008	-0.146*	-0.091**	0.034**
	(1.981)	(0.280)	(1.779)	(2.719)	(2.360)
One Year ROA	-0.327***			0.134	
	(3.702)			(1.083)	
Current Assets/TA	0.641				0.048
	(1.239)				(0.193)
PP&E/TA	-0.121				
	(0.299)				
Delaware Dummy	0.393	0.144	-0.003	-0.556*	-0.028
	(1.639)	(0.634)	(0.007)	(1.824)	(0.217)
New York Dummy	0.397*	0.239	-1.176	-0.623**	-0.030
	(1.829)	(0.988)	(1.436)	(2.277)	(0.367)
Prepack Dummy	-0.153	0.609	-0.250	0.078	-0.095
	(0.362)	(1.675)	(0.311)	(0.201)	(1.059)
Working Capital/TA		-0.026			
		(0.168)			
Leverage					-0.170**
					(2.579)
Constant	2.319***	1.089	-1.641	-2.072***	0.626
	(3.506)	(1.056)	(1.644)	(3.544)	(1.694)
Number of observations	36	36	36	36	36
F	11.501	3.219	1.752	4.831	2.168
Prob>F	0.000	0.015	0.153	0.002	0.069
R-squared	71.10%	20.70%	33.60%	52.10%	23.10%