

Negative Equity Firms Prior to 2008 Great Recession

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Abstract

This paper examines the fate of firms that report negative book-value equity leading up to the 2008 Great Recession. This is the first study to document the quantity and longevity of negative equity firms and to analyze the sources of funds used to sustain these failing and recovering firms. For the full sample of Compustat from 1970 to 2007, negative-equity firms account for 9.66% of the 246,869 firm-year observations. The number of firms reporting negative equity steadily increases over the sample period, with less than 1% of the firms reporting negative equity in 1970 to more than 10% in 2007. Upon initially reporting negative equity, these firms remain active on average for an additional 6.18 years. Distressed firms appear to have a remarkable ability to generate substantial funds through short-term and long-term debt and through the issuance of stock, thereby postponing or avoiding costly bankruptcy. While negative equity firms may not have caused the 2008 Great Recession, the findings of this study reveal a disturbing trend that warrants further research.

Keywords: bankruptcy, great recession, leverage, negative equity

1. Introduction

1.1 Taxonomy of Negative Equity Firms

This study examines the fate of firms that report negative book-value equity leading up to the 2008 Great Recession. The vast literature on capital structure gives little attention to firms reporting negative equity. For the full sample of Compustat North America (Compustat) from 1970 to 2007, these firms account for approximately 9.66% of the 246,869 firm-year observations. I begin by tracking the roughly 7,311 negative equity (NE) firms and examine the taxonomy of these book-value insolvent firms, i.e., whether they remain vital or become inactive due to liquidation, bankruptcy, or a merger. These firms are typically classified as distressed and are generally excluded or their effects reduced in empirical studies on capital structure. Yet I find that firms initially reporting negative equity between 1970 and 2007 remain active, on average, for an additional 6.18 years. Given the quantity and longevity of NE firms, empirical studies that omit the influence of these firms may provide biased estimates.

1.2 Persistence of Negative Equity Firms

This study also includes the examination of the financial engineering evolution between lenders and distressed firms. I note a steady increase in the percentage of firms reporting negative equity in Compustat, with less than 1% of the firms reporting negative equity in 1970 to more than 10% in 2007, yet the longevity of these firms does not diminish. That is, there are a growing number of firms reporting negative equity that are not forced into bankruptcy. I investigate the sources of funds for firms over this time period to determine what in this age of financial engineering have lenders and distressed firms come up with to sustain the trend. I note ancillary evidence of success of these financial innovations by the simple fact that, in recent years, there are fewer distressed firms (in percentage) that eventually enter into bankruptcy and instead graduate through other means. Further analysis shows us that failing and recovering firms have a remarkable ability to generate substantial funds through short-term and long-term debt, but it is the firms that can issue more stock that remain vital.

2. Literature Review

Firms that report negative equity are technically insolvent, as their liabilities have surpassed their assets through the erosion of their retained earnings and contributed capital. Whether lenders will force these firms to bankruptcy or, instead, renew or expand the credit of these firms is examined in the bankruptcy literature, most

notably by Stiglitz (1972) and Bulow and Shoven (1978). These studies suggest that, if the proceeds from bankruptcy are less than the value of the firm, then avoiding bankruptcy will always be in the interest of the claimants; however, conflicts of interest among the various claimants of the firm may result in liquidation of the firm. Bulow and Shoven (1978) show that when asymmetry exists in the negotiating and controlling abilities of various claimants with conflicts of interest, actions taken with respect to bankruptcy are not always those that maximize the total value of claims on the firm. They also present cases in which a firm continues operating even though its liquidation value exceeds its present expected ongoing value, and show that negative net worth is not a sufficient condition to force a firm into bankruptcy.

Gilson (1990) studies the decisions of companies and creditors to recontract or enter bankruptcy by examining publicly traded companies that experienced severe financial distress between 1979 and 1985. Corporate default is found to bring about significant change in the ownership of firms' residual claims, e.g., banks assume 36% of the firms' common stock, on average. Significant changes are also observed in the allocation of rights to manage corporate resources, e.g., bank lenders and other creditors assume significant voting stock under firms' Chapter 11 reorganization plans and debt-restructuring. Out of the 111 firms tracked by Gilson (1990), 61 filed for bankruptcy under Chapter 11, while 50 restructured their debt. In this study, I show that the percentage of various debt restructuring activities has increased substantially.

Given the extant literature on financially distressed firms, coupled with the quantity and persistence of NE firms reported active in Compustat, I suggest a closer look at these firms is warranted. Specifically, I wish to determine if these firms on average remain the same, graduate to positive equity, get acquired, or enter bankruptcy. Although many of these NE firms have liquidation values that exceed their expected ongoing value at one point in time, it is possible that some firms may be 'zombie like' in that they remain vital but are controlled from outside forces such as bank lenders or other creditors. Other firms may temporarily fall on hard times and subsequently strengthen to become financially-sound via internal or external funding; while others may be subject to acquisition or go bankrupt and are liquidated. I document the relative frequencies of these occurrences and examine the transition probabilities of these firms via a hazard model. As demonstrated by Shumway (2001), a hazard model is preferable to static models because it corrects for period at risk, allows for time-varying covariates, and uses all available information to produce bankruptcy probability estimates for all firms at each point in time. Determining the probability that a firm once entered as 'problem/insolvent' in time t , will be in the same state, graduate, or disappear in the next period, will give us a better understanding of the fate of these firms, as well as their relative importance in capital structure studies.

A key part of this study investigates why some firms are able to remain vital while others are not. I catalogue the sources of funds for distressed firms upon reporting negative equity and then track the changes in these sources over time. Specifically, I look at the ability of failing and recovering firms to generate funds through the sale of assets and the issuance of stock and short-term and long-term debt. I also examine net income, and changes in accounts payable and receivables. By cataloging the various source changes within these firms, I find that the upward trend in the quantity and longevity of NE firms is a result of increased availability of funds generated by equity and debt.

Empirical studies on capital structure typically use some form of debt to asset ratio as a means to measure the leverage ratio of firms. Leverage ratios generally range from 0 to 1 for privately held and publicly traded firms, however, when a firm has negative equity, their leverage ratio exceeds one. In fact, it is not uncommon for some leverage ratios to exceed 100. It is this discontinuity in the distribution of leverage ratios that causes some researchers to explore ways to make their distribution of leverage ratios more normal. Common approaches include winsorizing or truncating leverage ratios at the 0.5% level (Frank & Goyal, 2003; Barclay, Smith, & Morellec, 2006; respectively), omitting extreme variables (Craig & Hardee, 2003), and excluding firms with leverage ratios greater than one (Cassar & Holmes, 2003; Cassar, 2004; Vos & Shen, 2007). As Trimbath (2001) explains, excluding firms with negative equity creates a sample bias in that I am attempting to measure firm performance to eliminate observations from a study on firm performance. However, no studies to date have attempted to quantify the prevalence of these firms or determine the extent of this potential bias.

Based on the results of this study, I argue that NE firms should be included in capital structure studies, and that a dynamic capital structure model that allows the refinancing cycles of firms to differ in the presence of adjustment costs is needed. As suggested by Strebulaev (2007), cross-sectional tests fail because they consider all firms simultaneously irrespective of their position in their refinancing cycle. In a dynamic economy, distressed firms are able to avoid bankruptcy by selling assets and restructuring bank debt and public debt. Thus, using a model that more accurately captures the dynamics of firm decisions may allow researchers to include NE firms and more accurately estimate the determinants in capital structure.

3. Methodology

3.1 Baseline Data

I gather annual data from Compustat on total assets, cash and cash equivalents, book value of equity, net income, EBIT, interest expense, notes payable, sale of property, plant, and equipment, sale of stock, issuance of long-term debt, changes in accounts payable, changes in accounts receivable, shares outstanding, share price, and reason for company deletion. I also gather annual data from the Center for Research in Security Prices (CRSP) on share price and delisting codes.

I begin with the full sample of Compustat firms from 1970 to 2007. I identify NE firms as firms with negative values for book equity. Firms are identified as active, bankrupt, or merged via Compustat and CRSP. Some firms become inactive in Compustat prior to 2007 and lack a Compustat reason for deletion code and CRSP delisting code. Of these firms, I identify those with share prices below 50 cents for three of its last five years as troubled and group these firms with the bankrupt and liquidated firms. All other firms are dropped from the sample. The final sample consists of 7,311 firms that report negative equity at least once.

3.2 Research Design

I begin by identifying the number of firms reporting negative book equity for every year in the sample. Upon the initial reporting of negative equity, these firms are tracked until they either become inactive, disappear from Compustat, or until the sample period runs out. I then analyze the taxonomy of these firms, including their cash flow, market value to assets, and status at their terminal point. Status may include active, inactive, liquidated/bankrupt, or acquired/merged. Since many of the firms are still in operation at the end of the period, longevity figures derived solely from the raw data will give downwardly biased estimates. I follow Kahn (1985) to correct for the truncation bias and estimate the survival expectancy as the total number of firm-years divided by the number of failed (inactive, bankrupt, or acquired) firms to obtain consistent estimates of the standard errors and overall better estimates of firm transitions. I use a Kaplan-Meier survivor function to examine transition probabilities, i.e., the probability that a firm once entered as potentially insolvent (negative equity) in time t will become inactive, go bankrupt, or merge in the subsequent periods.

Before choosing the specific type of hazard model to employ, I first make assumptions that the survival times follow a certain distribution. Distribution families considered include the exponential, Weibull, lognormal, and log-logistic distribution. I follow the diagnostics of Hamilton (2006) to properly characterize the distribution. For example, if failures occur randomly, with a constant hazard, then survival times follow an exponential distribution, which implies that the logarithms of the survivor function, $\ln(S(t))$, are linearly related to t (Hamilton, 2006). In a Weibull distribution, failure rates can increase or decrease smoothly over time and implies that $\ln(-\ln(S(t)))$ is a linear function of $\ln(t)$ (Hamilton, 2006). I find that the survival times more closely follow an exponential distribution, and therefore use a Cox proportional hazard model to estimate survival times.

I hope to show here that the probability of a firm remaining in the sample for a sufficient period of time (and perhaps becoming a healthier firm) after reporting negative equity is higher than what one would expect. This result would lend support to the notion that NE firms should not be blindly dropped from future empirical studies. Similarly, the practice of winsorizing financial ratios skewed by these NE firms would need to be more carefully considered.

Finally, I categorize the sources of funds for firms that report negative equity at $t=0$, and track the changes in sources for firms that remain active or become inactive in $t=1$, $t=2$, $t=3$, $t=4$, $t=5$, $t=6$, and $t=7$. I scale all source variables by total assets at $t=0$. Source variables analyzed include net income, notes payable, long-term debt, issuance of stock, sale of property, plant, and equipment, changes in accounts payable, and changes in accounts receivable. I create bar charts to compare active and inactive firm source of funds for $t=0$, $t=1$, ..., and $t=7$. I begin by comparing active firms at $t=0$ with firms that become inactive immediately following $t=0$. Next, I compare sources of active firms at $t=0$ and $t=1$ to firms that become inactive immediately following $t=1$. Next, I compare sources of active firms at $t=0$, $t=1$, and $t=2$ to firms that become inactive immediately following $t=2$, etc. Finally, I look for source trends in active and inactive firms across time periods and across source variables.

4. Results

The frequencies and percentage of firms reporting negative equity in Compustat for fiscal years 1970 to 2007 are reported in Table 1. Table 1 has been condensed for brevity. The full table can be obtained by contacting: dlawson@iup.edu. I note a steady increase in the percentage of firms reporting negative equity over the sample period, with less than 1% of the firms reporting negative equity in 1970 to more than 10% in 2007. A maximum percentage of 17.38% occurs in 2002. In total, NE firms account for approximately 9.66% of the 246,869

firm-year observations over the 1970 to 2007 period.

Table 1. Negative equity firms, 1970 to 2007

Year	Firms	NE Firms	% NE Firms
2007	6,117	639	10.45%
All Years	24,869	23,850	9.66%

The frequencies and percentages of negative and positive equity firms with negative cash flows between 1970 and 2007 are reported in Table 2. Table 2 has been omitted for brevity. The complete table can be obtained by contacting: dlawson@iup.edu. Approximately 19.51% to 62.70% of the NE firms report negative cash flows in a given year, while positive equity firms report negative cash flows 27.39% to 52.13% in a given year. For both negative and positive equity firms, much of the variation in reported percentages occurs between 1970 and 1985, and somewhat levels off between 1986 and 2007. In the latter period, the variation and percentages of negative and positive equity firms reporting negative cash flows are very similar ranging from 40% to 60%, with the percentage of NE firms reporting negative cash flows always 1% to 10% greater. Positive equity firms with negative cash flows represent 27% to 47% of all firms in a given year while NE firms with negative cash flows represent less than 10% of all firms in a given year. The fact that positive equity firms with negative cash flows represent a much larger percentage of all firms in Compustat is not surprising since NE firms represent less than 10% of all firm-year observations in Compustat between 1970 and 2007. What is somewhat surprising is that the percentage of positive firms reporting negative cash flows is similar in number and variation to the percentage of NE firms reporting negative cash flow, at least during the 1986 to 2007 time period.

Table 3 displays the percentages of negative and positive equity firms with negligible market value between 1970 and 2007 and Table 4 reports the frequencies and percentages. Tables 3 and 4 have been omitted for brevity. These tables can be obtained by contacting: dlawson@iup.edu. Market value for a firm is considered negligible if the quotient of its market equity divided by assets is less than 5% or 10%. The percentage of NE firms with negligible market value ranges from 17.68% in 2007 to 94.59% in 1974, with a general downward trend towards the end of the sample period. The percentage of positive equity firms with negligible market value ranges from 5.39% in 2007 to 45.53% in 1974, with a similar downward trend towards the end of the sample period. The percentage of NE firms with negligible market value is generally 20% to 40% greater than the percentage of positive equity firms with negligible market value in any given year.

Table 5 displays the percentages of negative and positive equity firms with negligible market value out of all firms in Compustat from 1970 to 2007. Table 5 has been omitted for brevity. The complete table can be obtained by contacting: dlawson@iup.edu. Positive equity firms with negligible market value represent approximately 5% to 45% of all Compustat firms in a given year, while NE firms with negligible market value represent approximately 1% to 7%. Positive equity firms with negligible market value represent a much larger percentage of all Compustat firms than NE firms with negligible market value, especially during 1970 and 1995. Subsequent to 1995, the difference in percentages between these two firm types steadily declines from 10% in 1996 to 3% in 2007. It is interesting to note here that over the last two decades the ratio of market equity to assets for positive equity firms has declined considerably while the ratio for NE firms has leveled off.

Tables 6 and 7 report figures pertaining to the longevity and ultimate demise of firms that report negative equity. Tables 6 and 7 have been omitted for brevity. These tables can be obtained by contacting: dlawson@iup.edu. In both tables, the fiscal year in which firms report negative equity for the first time is considered $t=0$. Of the 7,311 firms that report negative equity at $t=0$, 3,158 of these firms eventually go bankrupt or are liquidated, 1,569 merge or are acquired, and 2,584 remain active until the end of the sample period. According to mean figures in Tables 6 and 7, firms that report negative equity at $t=0$ remain active for an additional 6.18 years, and subsequently report negative equity an additional 1.94 times. These firms are active in Compustat for approximately 3.39 years prior to reporting negative equity at $t=0$, and report negative net income 2.04 times prior to $t=0$. Firms that eventually go bankrupt remain active for an additional 4.62 years after $t=0$, whereas firms that eventually merge remain active for an additional 5.97 years. NE firms that end up going bankrupt (merge) tend to be older (younger) than the average NE firm at $t=0$ and have reported negative net income more (less) than the average NE firm prior to $t=0$. NE firms that remain active until the end of the sample period report negative equity subsequent to $t=0$ more than the average NE firm.

Survival analyses of NE firms are reported in Tables 8 and 9. Tables 8 and 9 have been omitted for brevity. These tables can be obtained by contacting: dlawson@iup.edu. Upon reporting negative equity for the first time, there

is a 64.66% probability that a firm will become inactive in Compustat prior to the end of the sample period. Based on a Kaplan-Meier survivor function, these firms have a 25% chance of becoming inactive within 2 years of reporting negative equity, a 50% chance of becoming inactive within 6 years, and a 75% chance of becoming inactive within 15 years. The probability that a NE firm goes bankrupt before the end of the sample period is 43.20%, with a 25% chance that the firm will go bankrupt within 4 years of $t=0$, a 50% chance of going bankrupt within 11 years, and a 75% chance of going bankrupt within 27 years. The probability that a NE firm merges before the end of the sample period is 21.46%, with a 25% chance that the firm will merge within 8 years of $t=0$, a 50% chance of merging within 22 years, and a 75% chance of going merging within 35 years. Table 9 provides similar probability figures for firms that report negative equity multiple times.

Firms that report negative equity for a third time have the greatest probability of bankruptcy (46.40%). In fact, these firms have a 25% chance of going bankrupt within 2 years of posting negative equity a third time, a 50% chance of going bankrupt within 8 years, and a 75% chance of going bankrupt within 21 years. However, the probability of becoming inactive or merging is greatest at $t=0$. It is interesting to note here that, while the probabilities for bankruptcy increase up and until a third reporting of negative equity, all other probabilities tend to mildly decrease the more times a firm reports negative equity. This downward trend is also seen in the probability of bankruptcy beyond a third reporting of negative equity. The lowest probabilities of failures occur when a firm reports negative equity 8 or more times.

Table 10 reports estimates from a Cox proportional hazard model for the survival of NE firms, where the number of times a firm reports negative equity is the dependent variable. Table 10 has been omitted for brevity. The full table can be obtained by contacting: dlawson@iup.edu. The results of Table 10 reflect similar findings to Table 9, in that the number of times a firm reports negative equity decreases the probability a firm will become inactive, go bankrupt, or merge. The hazard ratios show us that firms that report negative equity one additional time are 13.12% less likely to become inactive, 8.9% less likely to go bankrupt, and 23.6% less likely to merge prior to the end of the sample period. All figures are statistically significant at the 1% level.

In Tables 11 and 12, I compare sources of funds between firms that remain active throughout the sample period after reporting negative equity at $t=0$ (hereinafter, active firms) and firms that become inactive subsequent to reporting negative equity at $t=0$ (hereinafter, inactive firms (IF)). Tables 11 and 12 have been omitted for brevity. These tables can be obtained by contacting: dlawson@iup.edu. For all charts, $t=0$ refers to the fiscal year in which firms report negative equity for the first time, and the source variables are a ratio of the variable to total assets at $t=0$. I begin the discussion by comparing active firms with firms that become inactive within two years of reporting negative equity. This discussion is followed by a summary analysis which compares active firms to firms that become inactive two to seven years subsequent to reporting negative equity at $t=0$.

Panel A of Table 11 compares sources of funds between active firms and firms that post negative equity in $t=0$ and become inactive prior to $t=1$ (IF0 - firms that becomes inactive immediately following $t=0$). While both active and IF0 firms have negative net income at $t=0$, IF0 firms have losses that exceed two times that of active firms. The mean firm ratio of net income to total assets for IF0 firms is -0.691, and for active firms the ratio is -0.315. The main source of funds for IF0 firms in $t=0$ comes from short-term and long-term debt, where the mean firm generates funds equal to 20% of their total assets through each source. The quantity of these funds is remarkable considering the imminent demise of these firms. Albeit smaller amounts, IF0 firms generate funds from the sale of property, plant, and equipment (PPE) and the sale of stock. Main sources of funds for active firms in $t=0$ come from the issuance of stock and long-term debt, which equal 16.3% and 24.9% of their total assets, respectively. Smaller amounts are also generated by short-term debt and the sale of PPE.

Sources of funds for active firms and firms that become inactive immediately following $t=1$ (IF1) are compared in Panel B of Table 11. Similar to IF0 firms, IF1 firms have extremely large negative net income to asset ratios at $t=0$ which exceed two times that of active firms. In $t=0$, the main source of funds for IF1 firms and active firms is from long-term debt, where the mean IF1 firm generates funds equal to 24.9% of their total assets while active firms generate nearly 20%. Both firm types also generate a modest amount of funds through the issuance of short-term debt and the sale of stock, and negligible amounts from the sale of property, plant, and equipment. In $t=1$, active and IF1 firms are both able to generate a substantial amount of funds from the sale of stock. For both firm types, sources of funds generated by the sale of stock exceed 40% of their total assets. Given that IF1 firms become inactive the following period, these figures suggest the existence of the 'lemons problem'. Long-term debt issuance is another major source of funds for both firm types, where IF0 firms generate slightly more funds through this source. The only other notable source of funds in $t=1$ comes from notes payable for IF1 firms.

The remainder of the discussion focuses on comparisons of source variables between active firms and firms that

become inactive two to seven years subsequent to reporting negative equity at $t=0$. Panels C, D, E, F, G, and H of Table 12 provide bar chart comparisons while Panels A, B, C, D, E, F, and G of Table 12 provide a numerical breakdown. Similar to the preceding paragraphs, the following notation is used: IF2 refers to firms that become inactive immediately following $t=2$, IF3 refers to firms that become inactive immediately following $t=3$, IF4, etc.

As expected, the average net loss percentage to assets is always greater for inactive firms than active firms, regardless of the time period, i.e., the mean net income to assets of IF0 to IF7 in $t=i$ is greater than active firms in $t=i$ (Panel A of Table 12). Inactive firms have 18% to 106% greater net losses to assets on average. The greatest differences occur in $t=2$ (69%) and $t=7$ (106%), and the smallest differences occur in $t=4$ (20%) and $t=5$ (18%). Given the disparities, I can infer that net income plays a vital role in the determining whether a firm becomes inactive. However, the differences in net income for $t=i$ does not follow a meaningful path, i.e., I cannot say that net income is most important in the earlier or later periods following $t=0$.

Short-term debt is used much more extensively by inactive firms in $t=i$ than active firms, i.e., the mean notes payable to assets of IF0 to IF7 in $t=i$ is greater than active firms in $t=i$ (Panel B of Table 12). Inactive firms increase their short-term debt to assets ratio 65% to 157% more than active firms. The greatest differences occur in $t=2$ (116%) and $t=4$ (157%), and the smallest differences occur in $t=1$ (78%) and $t=5$ (65%). The fact that inactive firms (IF0 – IF7) rely more heavily on short-term debt for sources of funds may be a result of not being able to exploit other source means.

Except for $t=1$, active firms use the sale of stock more heavily than inactive firms at $t=i$. The mean sale of stock to assets of active firms is 17% to 48% greater than the mean inactive firm (mean of IF0 to IF7) at $t=i$, except for $t=1$. The greatest differences occur in $t=2$ and $t=4$ where active firms sell 34% to 48% more stock, respectively, as a percentage of assets, than inactive firms (IF0 – IF7). The smallest differences occur in $t=6$ (17%) and $t=7$ (18%). Given that $t=1$ represents the fiscal year immediately following the period in which firms report negative equity, it is interesting to find that soon to be inactive firms are able to sell a greater percentage of stocks than vital firms. This may be an indication of a lemons problem, especially given that inactive firms (mean of IF1 to IF7) sell 20% more stocks as a percentage of assets than active firms at $t=1$. It also suggests that there may be value in waiting two or more years after reporting negative equity to issue stock, as indicated by the success (survival) of active firms selling more stock in $t=2$ and beyond.

Active and inactive firms both rely heavily on long-term debt as a source of funds. This is especially true in $t=3$ and beyond. The mean ratio of issuance of long-term debt to assets is greater than .458 for fiscal years $t=3$ to $t=7$ for both active and inactive firms. The ability of these firms to raise this amount of debt is remarkable given the state of cash flows and net income for these firms. For inactive firms, the mean issuance of long-term debt increases steadily from $t=0$ to $t=5$, whereas the mean issuance for active firms increases steadily from $t=0$ to $t=7$. While active firms may be better able to access such funds, it is clear that long-term debt is an active source for both failing and recovering firms.

Inactive firms (IF0 – IF7) tend to sell off more property, plant, and equipment than inactive firms, however, it does not appear to be a significant source factor except for IF7 in $t=5$, $t=6$, and $t=7$. Similarly, changes in accounts receivable and accounts payable result in very little source variability for active and inactive firms.

5. Conclusion

Much research has focused on the 2008 Great Recession, but this is the first study to look at seemingly troubled firms via negative book equity. I document a growing number of firms reporting negative equity between 1970 and 2007, yet the longevity of these firms is not diminishing. Firms that report negative equity remain active for an additional 6.18 years on average, and firms that report negative equity multiple times have a higher probability of survival. These facts alone raise concerns as to their omission from empirical studies on capital structure. The ability of firms to metamorphose from insolvent to solvent is increasing as creditors and firm owners seek alternatives to costly bankruptcy.

While negative equity firms are more likely to be associated with negative cash flows and negligible market value, I show that this distinction is fading. I also show that net losses, while much larger for failing firms than recovering firms, reveal no meaningful predictive pattern for failure and that failing and recovering firms both exhibit the remarkable ability to access substantial short-term and long-term debt during periods of high uncertainty. Blurring the line even further, failing firms are more successful in generating funds from the issuance of stock immediately after posting negative equity, while recovering firms are more successful in issuing stock in all other periods.

This is the first study to document the quantity and longevity of negative equity firms and to analyze the sources

of funds used to sustain these failing and recovering firms. This study is also the first to show that an inverse relationship exists between the number of times a firm reports negative equity and the probability of failure. Moreover, I find that insolvent firms have a remarkable ability to generate substantial funds through short-term and long-term debt. And while negative equity firms may not have caused the 2008 Great Recession, the findings of this study reveal a disturbing trend that warrants further research.

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