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THREE ESSAYS IN CHAPTER 11 BANKRUPTCY: POST BANKRUPTCY PERFORMANCE, BANKRUPT STOCK PERFORMANCE AND RELATIONSHIP WITH HEDGE FUNDS AND OTHER VULTURE INVESTORS

A Dissertation Presented

By

MIN XU

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

September 2010

Isenberg School of Management

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Approved as to style and content by:

_____
Ben Branch, Chair

_____
Bing Liang, Member

_____
Mila Getmansky Sherman, Member

_____
Anna Liu, Member

_____
D. Anthony Butterfield
Program Director
Isenberg School of Management

DEDICATION

To my parents and fiancé

ACKNOWLEDGEMENTS

First and foremost, I would like to thank my advisor Professor Ben Branch for his thoughtful, patient and inspiring guidance and support all these years. His encouragement and advice make my life here as a Ph.D. student intellectual rewarding. I would also like to thank you all my committee members – Professor Bing Liang, Professor Mila Getmansky Sherman, and Professor Anna Liu, for being supportive throughout the years in my Ph.D. program.

I would also like to thank you Professor Nelson Lacey for inspiring me to develop my own teaching style, and thank you Professors Nikunj Kapadia, Hossein Kazemi, Sanjay Nawalkha, Thomas O'Brien, and Thomas Schneeweis for their support. Thanks are also due to all of the administrative staff for their help and cooperation over the years. I would also like to extend my gratitude to my fellow Ph.D. colleagues for making my Ph.D. life such an unforgettable journey.

Last but not the least, I would also like to thank my parents and my fiancé for their love, confidence, and encouragement. I would not be able to achieve my goal without them always being there for me.

ABSTRACT

THREE ESSAYS IN CHAPTER 11 BANKRUPTCY: POST BANKRUPTCY PERFORMANCE, BANKRUPT STOCK PERFORMANCE AND RELATIONSHIP WITH HEDGE FUNDS AND OTHER VULTURE INVESTORS

SEPTEMBER 2010

MIN XU

Ph.D., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Professor Ben Branch

Firms that emerged from Chapter 11 as public companies have tons of characteristics. The first essay analyzes their post bankruptcy performance, duration effect, and the quality of their projection information. While the sample's post bankruptcy performance does show improvement, their projections tend to be optimistic. Firms with shorter durations in Chapter 11generally achieve better performance than those with longer durations, in terms of Z-scores, but not in excess returns. Compared to firms that did not provide (complete) projection information, the sample firms generally exhibit better improvement, as measured by Z-scores and short term excess returns.

The second essay tracks the holding period return in investing in bankrupt stocks using a buy-and-hold strategy. Holding period return using stock price alone cannot show the entire story, as when considering final distributions plus the stock price, we see a much severe loss. In the regression analysis, the results reveal that liquidity is always a key factor in explaining the returns. Profitability and information uncertainty plays a significant role in explaining the positive returns, while liquidity and (un)profitability are the two key issues in negative returns. In addition, the involvement of hedge funds does not show signs of better stock performance.

The third essay explores the role hedge funds play as investors in bankrupt firms. The results show that their major contributions are to provide liquidity for and help the troubled firms improve their profitability. Compared the performances in post bankruptcy to pre-bankruptcy level, bankrupt firms with hedge funds involvement tend to be in better shape compared to the ones without any vulture investments, however, firms with hedge fund show comparable results with the ones with other vulture investors, such as private equities. In addition, the above improvements only appear in the short run, and the involvement of hedge funds does not guarantee a better stock performance. Therefore, hedge funds are more of financial players, rather than strategic players, as hedge funds do not help the troubled firms go through a systematic restructuring to achieve sustainable improvements.

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CHAPTER 1

CAN PROJECTION INFORMATION SHED LIGHT ON POST BANKRUPTCY PERFORMANCE?

1.1 Introduction

Chapter 11's effectiveness has been much debated. Hotchkiss (1995) finds that over 40% of the firms exhibit continuing operating losses in the first three years after they emerge from Chapter 11. On the other hand, Mooradian (1994) finds that a stint in Chapter 11 generally increases efficiency by allowing viable firms to renegotiate and continue. Eberhart, Altman, and Aggarwal (1999) find large positive excess stock returns over 200 trading days following emergence using difference benchmarks. Kalay, Singhal, and Tashjian(2007) also show that sample firms experience significant operating performance improvements.

The related literature has largely focused on post bankruptcy performance. Only a few studies have utilized the important information (e.g. the plan of reorganization and disclosure statement) revealed during Chapter 11. None the less, the feasibility and effectiveness of the restructuring plan actually plays an important role in the reorganization plan's success or lack thereof. The disclosure statement is supposed to provide adequate information for the bankruptcy case's claimants to vote on the reorganization plan. If present in the disclosure statement, the financial projections act like a roadmap for the reorganization plan.

Our paper is focused on a sample of firms that not only successfully emerged from Chapter 11 as public companies but also produced complete projection information during the process. Our goal is to investigate the performance of these sample firms, the

duration effect, and performance comparison between our sample firms and the firms that also emerged as public companies but without projection information.

We use Altman's Z-score as our bankruptcy probability measure. The overall Z-score of our sample improved from their pre- to post-Chapter 11 levels. The average values, however, did not reach the safe zone after emergence. The overall correlation tests between the projected Z-score and the actual post bankruptcy Z-score are significantly positive, indicating that the projections are associated with the firms' post bankruptcy performance. The error term, which is the gap between the actual post performance and projected performance, is, however, significantly negative. When we decompose the overall performance into different financial aspects, we find that the improvement in liquidity and leverage are the most important factors to a successful reorganization. Firm size, measured by total assets, is not a significant factor.

Next, we analyze the effect of the duration of the Chapter 11 process. Duration proxy for the feasibility of the reorganization plan, as more feasible plan would generally take a shorter time to pass through the approval process. Our sample, on average, spends 409 days in Chapter 11. Using the mean as a dividing line, we decompose our sample into two sub-groups. We find the correlation is stronger for the short duration group, indicating that firms that can emerge faster than average tend to have more consistent performance with their projection plan than do those with longer durations. In part one, we show that non-manufacturing firms generally exhibit better performance than do manufacturing firms. In duration tests, the non-manufacturing firms in the short duration group generally exhibit the best performance. We also find that duration is related to firm

size, although not in the linear way. Larger firms tend to spend more time in Chapter 11. However, we do not find significant duration effect in the excess returns.

We hypothesize that a firm that files a disclosure statement which contains complete projection information is likely to have a systematic well thought out reorganization plan. Accordingly, we compare our primary sample with another pool of firms that also emerged as public companies with reorganization plans that do not have projection information. The Z-score performance shows that the without-projection group underperforms the with-projection group in both the pre- and post-Chapter 11 periods. Moreover, the improvement in leverage is limited for the without-projection group. The without-projection group also has the longer average duration. Not only is the financial performance of the without-projection group not as favorable as that of the with-projection group, their stock performance also differs. We find significant positive excess returns for the with-projection group in first year after emergence. We do not, however, find similarly favorable results for the without-projection group.

The remainder of the paper is organized as follows. Section 2 is the literature review. Section 3 discusses data and descriptive statistics. Section 4 reports the overall performance for our sample. Section 5 focuses on the duration effect. Section 6 contains the group comparison between with-projection group and without-projection group. The conclusion is in Section 7.

1.2 Literature Review

The outcomes of Chapter 11 vary. Some companies liquidate during Chapter 11, some may be acquired or merged with another company, and some may successfully

emerged from Chapter 11, either as a private or public companies. Hotchkiss (1995) examined a sample of 806 public companies that filed for Chapter 11 between 1979 and 1988, finding that 197 (24%) emerged as public companies. Eberhart, Altman, Aggarwal (1999) investigated 546 chapter 11 filing from 1980 to 1993, finding that 131(24%) emerged as public companies. Bris, Welch, and Zhu (2006) tested 225 Chapter 11 cases and 61 Chapter 7 cases from the bankruptcy courts of Arizona and the Southern District of NY from 1995 to 2001. They found that 52% companies continued as independent companies when they emerge from Chapter 11. Hotchkiss and Mooradian (1998) examined 1200 public companies who filed for Ch 11 between Oct 1979 and Dec 1992. They found 339 (28%) reorganized as independent public companies, 111 (9%) were acquired, of which 55 were acquired by public companies. Morrision (2007) assembled a sample of 95 relatively small Ch 11 bankruptcy filings in the Northern District of Illinois in 1998. He found 9 (9%) were sold as going concerns, 27 (28%) exit as reorganized entities, 29 (30%) shut down in bankruptcy, and 30 (33%) liquidate.

Some studies have examined factors influencing whether a firm can successfully emerge from Chapter 11. Hotchkiss (1993) showed that firm size, measured by pre-petition assets, is the most important characteristic determining whether a firm will successfully reorganized. Many of the emerging firms downsize during Chapter 11. Denis and Rodgers (2007) find that larger firms are more likely to survive the Chapter 11 process and emerge as independent companies because they have greater resources for survival. He also finds that firms are more likely to reorganize and emerge as independent firms if they significantly reduce their liabilities while in Chapter 11. Das and LeClere (working paper, 2008) also conclude that larger firms have a higher

likelihood of turnaround because they have greater flexibility and are more resilient in the face of sudden shocks.

Duration is also an interesting aspect in Chapter 11. Li (1999) shows that the longer a firm stays in chapter 11, the less likely is it to exit as a reorganized firm. The length of time a firm is in Chapter 11 is significantly affected by whether or not it uses a prepackaged Chapter 11, the time it spends in pre-Chapter negotiation, the interruption of legal disputes, its gross profit margin, size, and the changing bankruptcy environment of the 1990s. Denis and Rodger (working paper, 2002) finds that the time spent in Chapter 11 does appear to provide valuable information about the firm's ability to restructure effectively. They find that changes in firm size and liability ratios are significantly negatively related to the likelihood of reorganizing, suggesting that firms are less likely to reorganize if they have not been successfully adjusting their operating or financial structure prior to entering Chapter 11. Denis and Rodgers (2007) found that firms with smaller size, better operating performance, and higher operating margins spend less time in Chapter 11. Firms are more likely to emerge as going concerns and to achieve positive post-reorganization profitability if they downsize significantly while in Chapter 11. Bris, Welch, Zhu (2006) find that the time in bankruptcy is a useful proxy for indirect bankruptcy costs. They also found that firms with more secured creditors tend to spend more time in bankruptcy. Moreover, they find the relationship between asset size and bankruptcy duration is weak or nonexistent. Heron, Lie, and Rodgers (2007) report that firms with higher pre-filing debt levels tend to emerge faster. They also document a strong positive relation between pre- and post-reorganization debt ratios.

Heretofore not as much attention has been paid to the projection information contained in the disclosure statement submitted during Chapter 11. Hotchkiss (1995) shows that the median forecast errors in each year studied are negative and differ significantly from zero. The forecast presented at the time of reorganization may reflect the reporting incentives of the persons preparing those forecasts. In addition, she also found that particularly poor performance before bankruptcy is associated with particularly poor performance after bankruptcy. Lehavy (2002) reports two conflicting incentives for firms adopting fresh start reporting. One is to overstate the projected equity value in order to promote the acceptance of the reorganization plan and expedite emergence from bankruptcy. The other one is to underestimate equity value in order to enhance reported performance post bankruptcy. Gilson, Hotchkiss, and Ruback (2000) found that estimated values are generally unbiased, but that the dispersion of valuation errors is very wide. Betker, Ferris, and Lawless (1999) report that the post bankruptcy performance forecasts contained in disclosure statements tend to be systematically optimistic. Furthermore, they find a negative relation between the forecast error and the size of the firms as well as with the firm's capital intensity.

Therefore, we test the following hypothesis:

Hypothesis 1: The projections included in the plan of reorganization tend to be too optimistic compared to the actual post-bankruptcy performances.

Hypothesis 2: The performances of firms who spent less time in Chapter 11 process tend to be more consistent with their projections and experience better performances in post-bankruptcy period compared to those who spend more time in Chapter 11.

Hypothesis 3: Firms providing complete projection information in their plan of reorganization tend to show stronger post-bankruptcy performances compared to the ones without (complete) projection information.

1.3 Data and Descriptive Statistics

1.3.1 Data

We obtained our initial sample of 1,117 firms that filed for bankruptcy between January 1978 and December 2006 from Professor Edward Altman of New York University. It contains bankruptcy filing of firms with liabilities at default of $100 million or greater. We added 99 filings in 2007 and 237 filings in 2008 from bankruptcydata.com to extend our database to the most recent period. Therefore, our starting total is 1,453 bankruptcy filing cases from 1978 to 2008. Next, we determined the bankruptcy outcome, filing date, confirmation date, and emergence date (if any) from Lexis-Nexis, New Generation Research, and form 10-K filings with the SEC. We restricted our sample period to 1986 to 2008 as the New Generation Research database begins with 1986 thereby excluding 68 firms that filed before 1986, shown in Table 1.1.

Table 1.2 reports the six bankruptcy outcomes of our sample: acquired/purchased, liquidated, converted to Chapter 7, reorganized, dismissed and undetermined. Reorganization comprises 50% of the sample, in which 254 firms (18.3%) eventually emerged as public companies. Acquired/purchased takes 7.9%, liquidated 14.4%, converted to Chapter 7 6.3%, dismissed 3.0%, and undetermined case, in which the result is unknown or the firm remained in Chapter 11, accounts for 19.2%. We exclude 110 firms that were acquired or purchased, 199 firms that were liquidated during bankruptcy

process, and 87 firms that converted to Chapter 7 filing. Forty two dismissed cases and 266 undetermined cases were also dropped. From the remaining 681 reorganized firms, we obtained a sample of 254 firms that successfully emerged as public companies listed for trading in NYSE, NASDAQ, AMEX, or OTC markets.

We further divided our sample into those firms that provided a complete projection plan during Chapter 11 process and those that did not. We collected annual accounting variables, including total assets, total liabilities, sales, and EBIT, from Compustat and SEC for up to 5 years before and after the Chapter 11 filing. We limited our primary sample to 87 firms whose plan of reorganization and disclosure statement contain complete projection information as well as both pre- and post-Chapter 11 accounting information available in the Compustat database and/or from the SEC.

For each firm, we collect variables for the pre-Chapter 11, projection and actual post-Chapter 11 periods. Our time line is illustrated in Figure 1.1. The pre-1 period extends backward from the first fiscal year immediately prior to the Chapter 11 filing. Post+1 is the first fiscal year after emergence from Chapter 11. The filing date is the day when the company files for, and the emergence date is the day when the company exits from Chapter 11. This process produced 1,298 firm-year observations. In Table 1.3, we further divide our sample into 33 manufacturing (506 firm-years) and 54 non-manufacturing firms (792 firm-years). We categorize firms with SIC codes between 2000 and 3999 as manufacturing and non-manufacturing otherwise.

1.3.2 Descriptive statistics

For the pre-Chapter 11 period we have an average of 4.7 years of data, corresponding to 4.7 years for both manufacturing and non-manufacturing firms. Post-

Chapter 11 we have an average of 3.1 years of data with 3.3 years for manufacturing firms and 3 years for non-manufacturing firms.

Table 1.4a to 1.4c contain the summary statistics for selected variables of our sample firms, with Table 1.4a for all firms, Table 1.4b for manufacturing firms, and Table 1.4c for non-manufacturing firms respectively. The numbers are calculated an averages across all years and all firms. For example, the mean of total assets in the pre-Chapter 11 period is calculated in two averaging steps. We first calculate each firm's pre-Chapter 11 average total assets, based on all the available years. Second, we calculate the average of the averages of all of the sample firms.

We see that our non-manufacturing firms tend to be larger than our manufacturing firms. Our sample contains some commonalities. First, the firms that successfully emerged from Chapter 11 tend to downsize from their pre-Chapter 11 levels. The average size decreased from $2.74 billion to $2.32 billion. Second, the sample firms have generally reduced their total liabilities, overall from $2.34 billion to $1.7 billion. Third, overall average working capital increased from $384 million to $455 million after Chapter 11. Fourth, income also has risen into positive territory after the reorganization process. The pattern is similar for both manufacturing and non-manufacturing firms. The asset median is much smaller than the corresponding mean for all the three tables. Thus our sample contains some very large firms that dominate the averages.

We also compare the firm characteristics between manufacturing firms and non-manufacturing firms in one year before bankruptcy in Table 1.5. Besides total assets, net income and book equity, we also calculate four ratios. We use working capital divided by total asset as liquidity measure, total liabilities divided by total assets as leverage measure,

net income divided by sales as profitability measure and book value of equity divided by total assets as solvency measures. We find that manufacturing firms tend to be smaller than non-manufacturing firms in one year before bankruptcy. The results show that manufacturing firms have better average performance in net income and higher profitability, but have poorer performance in book equity, higher leverage, and lower solvency compared to non-manufacturing firms.

1.4 Overall Performance for Firms with Projection Information

1.4.1 Bankruptcy predictor

The relative effectiveness of the Z-score model has been much debated. The biggest competitors are some option-based models. Hillegeist et al. (2004) suggest their BSM-PB, which is based on Black Scholes (1973) and Merton (1974), carries more information about the probability of bankruptcy than models, such as Z-score model, which are based on accounting ratios. However, their option-pricing based formula relies on some economic assumptions, and one of them assumes no bankruptcy costs. Although the model has some theoretical appeal, bankruptcy costs have been well discussed in bankruptcy literature. For example, Bris, Welch, Zhu (2006) point out that the time in bankruptcy is a useful proxy for indirect bankruptcy costs. Hence, it should not be ignored. Miller (2009) compares the Z-score model to the distance to default model, finding that the distance to default model has superior ordinal and cardinal bankruptcy prediction power, and its rating durability outperforms the Z-score model over a long time span, beyond seven years. On the other hand, Miller (2009) also finds that the distance to default model has a more volatile rating, therefore, the Z-score model is more

stable than the distance to default model. However, the distance to default model is also based on Black Scholes (1973) and Merton (1974), hence, Miller (2009) has the same disadvantage as Hillegeist et al. (2004). Agarwal and Taffler (2008) point out that Hillegeist et al. (2004) does not take into account of differential error misclassification costs and the economic benefits of using different credit risk assessment approach. Their results demonstrate that traditional accounting-ratio-based bankruptcy risk models are not inferior to KMV-type option-based models for credit risk assessment purposes, and dominate in terms of potential bank profitability when differential error classification costs and loan prices are taken into account. Another disadvantage of option-based model is that they require some variables that are not always contained in the projection information, the analysis of which is the main target in this paper. For example, the distance to default model in Miller (2009) requires 252 daily values of market cap, total liabilities, dividend, and etc. Therefore, we are not able to test the quality of projection information based on those option-based models. Some critics such as Shumaway (2001) contend that the Z-score model fails to capture the time-varying changes in the underlying bankruptcy risk as the model usually just uses the data of one year prior to bankruptcy. In our paper, we collect as long as 5 years both before and post Chapter 11 data in order to capture the dynamics in the bankruptcy risk.

A number of researchers have found Altman's Z-score model (1968) useful for predicting both bankruptcy and financial distress (Grice and Ingram, 2001). If the Z-scores computed from projected performance are accurate predictors of the Z-scores that appear after the company emerges from bankruptcy, then those projection-based Z-scores

are likely to be useful predictors of actual performance. Accordingly, we utilize Altman's model (1968) to explore the projections' usefulness and accuracy.

The Z-score for manufacturing firms is calculated as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5 \quad (1)$$

where,

X_1= working capital / total assets, a measure of the firm's net liquid assets relative to its total capitalization

X_2 = retained earnings / total assets, is a measure of cumulative profitability over time relative to assets

X_3 = EBIT (earnings before interest and taxes) / total assets, a measure of the productivity of the firm's assets, abstracting from any tax or leverage factors

X_4 = market value of equity / book value of total liabilities, a measure of the value of firms' equity from the market perspective

X_5 = sales / total assets, a measure of the sales generating ability of the firm's assets

Z = overall index or score

Companies with Z-scores greater than 2.99, less than 1.81, and in between these values are said to be in the safe, bankruptcy and uncertainty zones respectively.

The Z-score model for non-manufacturing firms is followings:

$$Z=6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (2)$$

where,

X_1=working capital/total assets

X_2=retained earnings/total assets

X_3=EBIT/total assets

X_4=book value of equity/total liabilities

Z = overall index or score

Firms with Z-scores greater than 2.6, lower than 1.1 and in between these values are said to be in the safe, bankruptcy and uncertainty zones respectively.

Table 1.6 lists the average Z-score of our sample firms. The average Z-score is calculated in two steps. First, for each firm, we calculate the average Z-score for that firm across all its firm years. Second, we calculate the average Z-score across all our sample firms. Therefore, the Z-scores are across all firm years and across all sample firms. We see both very large and very small Z-scores. In order to reduce the potential bias introduced by extreme outliers, we winsorize our sample at the 5% level. With this procedure we retain all of the observations while mitigating the impact of the extreme outliers. In addition, we focus particular attention on the median rather than the mean in order further to limit the impact of outliers.

Recall that the lower Z-score boundaries are 1.81 and 1.1 for manufacturing and non-manufacturing firms respectively. The five year average Z-scores of more than half of our sample were in the bankruptcy zone before filing Chapter 11. On the other hand, their average Z-scores improved substantially during the reorganization process. For all firms, the median Z-score changes from 0.328 in pre-Chapter 11 period to 1.330 post-Chapter 11. For manufacturing firms, the median changed from 0.973 to 1.997, and for non-manufacturing firms, it changed from -0.129 to 0.662. The Wilcoxon rank sum tests for the median suggest that the differences in the Z-scores between pre- and post-Chapter 11 are all significant at least at 10% level, indicating that the improvements in the Z-

scores are substantial for all the three groups. Despite these huge improvements after the Chapter 11 reorganization work, the average values of both manufacturing and non-manufacturing median Z-scores still did not reach the safe zone.

Table 1.7 contains information on the post-Chapter 11changes in their Z-scores. In order to explore the dynamics of the Chapter 11 process we define four scenarios: above-to-above, above-to-below, below-to-below and below-to-above. An above-to-above firm's Z-score is above the median both pre-Chapter 11 and post-Chapter 11. The other three scenarios are similarly defined. The first line is the number of firms in each dynamic scenario. For example in the case of the all firms group, 27 have Z-scores above the median in both the pre- and post-Chapter 11 periods, while the Z-scores of 17 firms change from above-the-median level in pre-Chapter 11 to below-the-median level after Chapter 11.The second line is the change in our Z-score, defined as the difference between post- and pre-Chapter 11 Z-scores. We also show the p-values in the bracket. The mean difference of Z-score in above-to-above scenario for all the firms is 1.392 which is significant at the 1% level. Thus, on average, the post-Chapter 11 Z-score is significantly higher than the pre-Chapter 11 level for this scenario. In other words, if a firm has a Z-score that is above the median in pre-Chapter 11, and if that firm does an effective restructuring job, it has a good opportunity to perform better than the median level in the post-Chapter 11 period.

For above-to-below scenario, we obtain negative mean differences, -1.145 for all firms and -1.274 for non-manufacturing firms. Both results are significant at the 1% level, indicating that the performance of the firm is well represented by the Z-score as we expected. For below-to-below scenario, we obtain significant and positive changes in the

Z-scores for all firms and non-manufacturing firms, similar to the changes in the above-to-above scenario. It shows some improvements during the Chapter 11 process, however, as this group of firms has a Z-score that is below the median in pre-Chapter 11 period, indicating some particularly severe financial problems, the change in the Z-score is not sufficient for this group to perform better than the median level.

The below-to-above group constitutes the most successful scenario. All of the mean differences are positive and significant at least at the 5% level. To change from below-the-median to above-the-median level is especially challenging. The magnitude of the restructuring work should be the largest, which is reflected in the mean difference. The mean difference for all firms in the above-to-above scenario is 1.392, while for the below-to-above scenario, the mean differences are 5.672, 3.026, and 5.676 for all firms, manufacturing firms, and non-manufacturing respectively.

Non-manufacturing firms exhibit significant Z-score changes in all four scenarios, while manufacturing firms only have one significant result for below-to-above scenario. Thus compared to manufacturing firms, non-manufacturing firms appear to do a much better job at reorganizing.

In Table 1.8a to 1.8e, we dig further to investigate the source of the change in the Z-scores in Table 1.7 above. We explore the change in the leverage (total liabilities/total assets) and firm size, the duration for each scenario (the length of time between the Chapter 11 filing date and the effective date) and the change in the variables in the Z-score model. Table 1.8a contains statistics for all firms, Table 1.8b and 1.8c are for manufacturing firms, and Table 1.8d and 1.8e are for non-manufacturing firms. These results suggest that, the most important factors in an effective restructuring are leverage

and liquidity. We see that for companies in the above-the-median zone in the post-Chapter 11 period, (above-to-above and below-to-above scenarios), improvements in leverage and liquidity are significant for all firms, manufacturing firms and non-manufacturing firms. Clearly, these two key factors need to be carefully addressed during the Chapter 11 process. For the particularly challenging below-to-above scenario, a successful reorganization involves a thorough restructuring in almost all aspects. In each of the table, for the below-to-above scenario, we can see significant improvements in a majority of the factors. Comparing manufacturing firms and non-manufacturing firms, the latter group did a generally more effective restructuring job, as we can see in Table 1.8d and 1.8e.

Table 1.4a to 1.4c showed that successfully reorganized firms tend to downsize substantially while in Chapter 11. Size, however, does not show up as a significant factor in Table 1.8a-1.8e under all four scenarios. Another interesting factor is duration. We find that the most challenging scenario, the below-to-above, involves the shortest duration for most of the scenarios. Perhaps the restructuring plans for those firms are generally seen as effective so that they can be approved quickly without too much negotiation.

Figure 1.2a to 1.2c show the histograms which allow us to compare actual Z-scores with the corresponding projected Z-scores. We explore whether the actual Z-score is higher or lower than its projected level as well as the size of the deviation. The histograms illustrate the distribution of the deviations of all firm-year observations for our sample. We find that the actual post-Chapter 11 Z-score is very generally below its projected level: 75% of all our sample firms, 83% for manufacturing firms, and 69% for

non-manufacturing firms, have actual Z-scores below their projected levels. For all firms, 36.5% of all our firm-year observations have actual Z-scores which are between the predicted and half of the predicted levels. Clearly the projected Z-score obtained during the reorganization period tends to be too optimistic.

1.4.2 Correlation tests between projected performance and post Chapter 11 performance

Table 1.9 contains the correlations for projected and actual post-Chapter 11 performances across all firm-year observations. The overall correlation, which includes all sample firms, is positive, 0.14, and significant at the 5% level. For non-manufacturing firms we find a positive correlation of .22 between projected Z-score and actual post bankruptcy Z-score which is also significant at 5% level. We obtained a negative but insignificant correlation for manufacturing firms. Therefore, the post bankruptcy performance for manufacturing firms tends to be unrelated to their projections. In short, non-manufacturing firms generally provide reasonably useful projections whereas those from manufactures tend to be unreliable.

Table 1.10 contains statistics for the prediction error defined as the difference between the post-Chapter 11 and projected Z-score. The prediction error means are -0.66, -1.32, and -0.52 for all firms, manufacturing firms, and non-manufacturing firms respectively. All are significant at the 5% level or better. These results are consistent with Gilson, Hotchkiss, and Ruback (2000) in that the projected values are generally unbiased, but the estimates are not very precise. These negative error terms imply that when firms file plans of reorganization and disclosure statements, they tend to be

optimistic about their after-emergence performance, which is also shown in Betker, Ferris, and Lawless (1999).

1.5 Duration Effects

Denis and Rodgers (2002) find that time spent in Chapter 11 appears to provide valuable information about a firm's ability to restructure effectively. Li (1999) reports that the length of a Chapter 11 bankruptcy is significantly affected by the time it spends in pre-Chapter 11 negotiation, the interruption of legal disputes, its gross profit margin, and firms size. Denis and Rodgers (working paper, 2002) find firms are more likely to emerge as going concerns and to achieve positive post-reorganization profitability if they significantly downsize while in Chapter 11.

Starting from Table 1.11, we show the results for the impact of duration (the number of days between a firm's bankruptcy filing date and its reorganization plan's effective date) on the performance of our sample firms. Table 1.11 reports our sample firms' average duration to be 409 days. This is much shorter than the 828 day average duration reported in Bris, Welch, and Zhu (2006), indicating that the companies which can successfully emerged as public firms, generally spend much less time than average in Chapter 11. The extreme cases include one firm which spent 2,217 days, and another which only spent 33 days in Chapter 11. We would expect a longer duration period for some companies, especially larger ones as they generally have more parties to deal with in their reorganization plans. The extreme durations impact the overall mean such that that the duration median is substantially below the mean. For example, in Table 1.11, the overall median is 266 days, compared to a mean of 409 days. Thus half of our sample

firms complete their reorganization process in less than a year. The average durations of our sample also differ for manufacturing (522 days) and non-manufacturing (336 days) firms. The maximum duration of manufacturing firms is 2,217 days, while only 1,257 for non-manufacturing firms. Manufacturers may be more complicated to reorganize with inventories, work in process, raw materials, etc. to deal with.

In Table 1.12, we repeat our correlation test of projected and post-Chapter 11 Z-scores for different durations. We divide the two groups based on their own group duration medians. A firm having a longer duration (shorter) than the median, is defined as a long (short) duration case. For example, the median duration for all the firms is 266 days. Thus a firm whose duration is longer than 266 days is assigned to the long duration group. We find a positive correlation between the projected and the post bankruptcy Z-score for our short duration group. The results are significant at least at the 5% level. The correlation between all the firms in the short duration group is 0.318, and 0.391 for manufacturing firms and 0.306 for non-manufacturing firms, which is stronger than the overall correlation shown in Table 1.9. In contrast, the correlations are positive but not significant for all firms and non-manufacturing firms and weakly significantly negative in the long duration group.

Another interesting result in Table 1.12 is the correlation for manufacturing firms of short and long duration. When we divide manufacturing firms based on their durations in Chapter 11, our correlation results differ. Shorter duration firms have a positive correlation, 0.391, between projected information and actual post-bankruptcy information, and it is significant at 5% level. Longer duration firms actually have a negative correlation this time, -0.288, which is significant at 10% level. Thus a manufacturing firm

spending less time in Chapter 11 generally has a much more reliable forecast of post-Chapter 11 performance than a firm that spends a longer time in the reorganization process. For non-manufacturing firms, the correlation remains positive for short duration group, which is consistent with the overall result. Firms with short durations show stronger forecasting accuracy, a correlation of 0.306. The correlation for firms with long durations is also positive, but that result is not significant.

In Table 1.13, we repeat the univariate tests of the predicting errors. Table 1.12 reveals differences between short and long duration cases. In Table 1.13, we explore the different duration effects more closely. The mean error is the difference between actual and projected post-Chapter 11 Z-score. First, we find that all the mean errors are negative. For all firms, the mean errors are -0.541 and -1.401 for firms with short duration and long duration respectively. The results are significant at least at the 5% level. For manufacturing firms, the mean errors are -0.540 and -2.703 for short and long duration firms respectively. For non-manufacturing firms, the mean errors are -0.538 and -0.846 for short and long duration firms respectively. The negative mean errors are all consistent with the results of Table 1.10, indicating that for all categories, the actual post performance is less favorable than predicted in the disclosure statement. We obtain all significant results except for non-manufacturing firms with short durations. Second, the long duration firms always generate larger mean errors. For example, for all firms, the mean error for short duration group is -0.541, compared to -1.401 for all firms with long duration, and the difference is 0.860, which is significant at 5% level. This result is consistent with Table 1.12 that the short duration firms generally provide more reliable projections. The mean errors are not as large as those with long durations, although still

the post-bankruptcy performance is generally below the predicted level. Third, we find that the non-manufacturing firms have a smaller mean error, no matter what duration groups they belong to. For the short duration group, the non-manufacturing group has a mean error of -0.538, which is a little smaller than the one for manufacturing firms, -0.540. For the long duration group, non-manufacturing firms have a mean error of -0.846, compared to -2.073 for manufacturing firms. Hence, the post-bankruptcy performances of non-manufacturing firms are more likely to be consistent with their projections. Moreover, if we combine what we have found so far in this section, we would prefer short duration group and non-manufacturing firms. The non-manufacturing firms with short durations have a mean error of -0.538. That is, the actual post-bankruptcy performance for non-manufacturing firms with short durations would be the most in line with its prediction.

In Table 1.14 we divide our sample into quartiles based on their total assets with Q1 defined as those firms that are in the below 25% quartile and Q2, Q3 and Q4 for 50%, 75% and 100% cut points respectively. We find that, in general, duration increases with size, although not monotonically. For all firms, Q1, Q2, Q3, and Q4 have average durations of 354, 276, 328, and 679 days, respectively. The most significant result comes from Q4 groups, which has the longest average duration, especially for manufacturing firms (1037 days). The Q3-Q4 magnitude increases from 328 to 1037 days for manufacturing firms. The trend is similar for the duration median numbers. The results are consistent with Denis and Rodgers (working paper, 2002) that larger firms and firms with higher liability ratios spend more time in Chapter 11, consistent with bankruptcies being more complex for firms that are larger or that have more debt.

In Table 1.15 we explore the relationship between duration and excess stock return, (stock return less the corresponding S&P 500 return). Duration itself is possibly an indicator of the efficiency of the reorganization plan process. The first interesting result is the significant large positive excess returns for the long duration group in the first year after emergence, both for means and medians. The mean of excess returns for all firms in the long duration group is 49.2% and the median is 18.7%. This is mainly contributed from the non-manufacturing firms, with 50.9% in mean and 18.8% in median. The significant short-term positive returns do not exist in manufacturing firms. However, the differences between the short and long duration groups are not significant at almost all year and all firm levels, indicating that even though some short-term excess return is possible, the two duration groups' excess returns do not differ significantly.

In Table 1.16, we take a deeper look at the period between the confirmation date and the Chapter 11 effective date. This is the period between the time when a company has its reorganization plan approved by the court and it officially emerges from Chapter 11. For all our sample firms, they spent an average of 37 days during this period. The median is 22 days. One firm took 348 days, and another only 1 day, to emerge from Chapter 11 after plan confirmation.

Stock trading for some companies starts right after their reorganization plan receives court approval, while some may wait until they officially emerge from Chapter 11. In Table 1.17, we identify 7, 3 manufacturing firms and 4 non-manufacturing firms, with a trading history between their confirmation and effective dates. The median of the daily excess return, which is the difference between the daily absolute return and the daily S&P500 returns, is -0.02% for all the sample firms, -0.81% for manufacturing firms,

and 0.22% for non-manufacturing firms. The mean excess returns are not significant for any of the groups.

1.6 Group Comparison - With Projection and Without Projection

For comparison we identify 85 firms which did not provide projection information during the Chapter 11 process that have both pre-Chapter 11 and post-Chapter 11 financial data available in the Compustat database and/or in SEC filings from our 254 emerged public firms. Providing a projection plan in the Chapter 11 plan of reorganization and disclosure statement process may indicate that the company has an effective systematic restructuring plan. We shall now examine the Z-scores, duration, leverages, and excess stock returns for the with- and without-projection groups.

Table 1.18 shows the overall Z-scores in both the pre- and post-Chapter 11 periods. We find that the median Z-scores for the without-projection groups are lower than the median Z-scores for the with-projection group in the pre-Chapter 11 period, except for manufacturing firms. The pre-Chapter 11 median of all firms for the with-projection group is 0.328, which is higher than the corresponding median, 0.198, for the without-projection group. However, both the mean and median differences between two groups are not significance in the pre-Chapter 11 Z-scores. It seems that overall there is no substantial difference between with-projection and without-projection group before bankruptcy filing. In the post-Chapter 11 period, the Z-scores for the without-projection group are lower than the with-projection group for all firm categories in medians. For example, after Chapter 11, the median of all firms for the with-projection group increases to 1.330, compared to the median of 0.283 for the without-projection group. The median

differences between the groups in the post-Chapter 11 Z-scores are significantly positive for all firms and non-manufacturing firms, suggesting that with-projection group did the better restructuring job during the Chapter 11 process. The improvement in the Z-scores for the with-projection group is obvious. The improvement for the without-projection group is, however, much smaller. If a company is in especially poor shape before filing for Chapter 11, and does not put together a systematic restructuring plan with projections, it is likely to continue to suffer from the distress in the post bankruptcy period.

In Table 1.19a and 1.19b, we decompose the Z-score into 5 years before and after Chapter 11 in order to explore the dynamics of the change in Z-scores over time. Not surprisingly as firms move toward their Chapter 11 filings, their overall mean and median of Z-scores decrease for both the with-projection and without-projection groups. The magnitude of decrease in the Z-scores is especially large for the without-projection group in the last year before filing. For example, for all firms, the mean Z-score for the without-projection group decrease from -2.753 to -6.525 in the last year compared to 0.008 to -1.854 for the with-projection group. The median Z-score decreases from 0.688 to -2.143 for the without-projection group, compared to 0.242 to -1.147 for the with-projection group. In the year prior to the Chapter 11 filing, the without-projection group generally has a lower Z-score than the with-projection group, and the difference between two groups are significantly positive for almost all categories. Even though we do not find a substantial difference in the overall results in Table 1.18a, a closer look at the year by year results do reveal that the with-projection group is actually stronger than the without-projection group one year before the bankruptcy filing. When they emerge from Chapter 11 protection, the median Z-scores for the with-projection group generally increase over

the next 5 years. However, for the without-projection group in post-Chapter 11, the median Z-scores for al firms are literally not significantly different from zero for all five years. When we compared their Z-scores on a year by year base, we also find that the with-projection group does a better job in the post Chapter 11 period. We find significantly higher Z-score for the with-projection group in all firms and manufacturing firms, and they outperform the without-projection group for up to three years after emergence. The without-projection group enters Chapter 11 in worse shape compared to with-projection group. When those two groups emerge from Chapter 11, the with-projection group still performs better than the without-projection group, which is consistent with Table 1.18a and 1.18b that the distress in without-projection group tends to persist in the long-run. Moreover, we find that only about half of the firms that emerging from Chapter 11 survives 5 or more years. The rest may be acquired, liquidated or file for bankruptcy again.

In Table 1.20a and 1.21b, we report the components of Z-scores by year both before and after Chapter 11, for manufacturing and non-manufacturing firms respectively. As the results may be biased by extreme outliers, as we did before, we only focus on the median numbers. We multiply the value for each factor by their Z-score coefficients in order to evaluate how each factor impacts the Z-score. In Table 1.20a and 1.20b, overall, the with-projection group is generally in a bit better shape pre-Chapter 11 than the without-projection group even though all the factors are decreasing as they approach their filing. The Z-scores for the without-projection group decrease at a faster pace than the ones for with-projection group. In addition to the Z-scores for with-projection group, three of their five factors, RE/TA, a profitability measure, EBIT/TA, a productivity

measure and Sales/TA, a turnover measure, are higher on a year-by-year basis than the ones for without-projection group. MktEquity/TL, a solvency measure, decreased substantially for without-projection group before Chapter 11. Perhaps the debt burden is heavier or the value of the stock is shrinking more quickly, or both.

The post-Chapter 11 performance difference for manufacturing firms between the with-projection and without-projection groups is even more obvious. The Z-scores for the with-projection group are increasing over time, while for the without-projection group, are decreasing. The with-projection group still has better performance in profitability, productivity, and turnover measure. Most of the factors are increasing for the with-projection group, however, the profitability and productivity measures are decreasing for the without-projection group.

Table 1.21a and 1.21b contains the results for non-manufacturing firms. As the Z-score models differ for manufacturing and non-manufacturing firms, the factors and coefficients are different for them. None the less, the big picture revealed in Table 1.20a-1.20b and 1.21a-1.21b is consistent. Pre-Chapter 11, the with-projection group exhibits better performance. This is not only revealed in the overall Z-scores, but also in RE/TA and EBIT/TA. Moreover, the without-projection group's Z-scores and four factors all decrease substantially. Post-Chapter 11 the with-projection group tends to do better than the without-projection group in the first three years. The WC/TA, a liquidity measure, is also better for the with-projection group. Moreover, the BookEquity/TL, which is a solvency measure for non-manufacturing firms, improves more for the with-projection group than the without-projection group. To improve this solvency measure, the company needs either to increase the book value of shareholder's equity, or decrease the total debt

burden. One important advantage of Chapter 11 is that it may help the company reduce its debt burden. Therefore, improvement in this measure may suggest that the reorganization is effective for the with-projection group. For the without-projection group, however, the restructuring work is not as effective. Starting in the fourth year, the median Z-scores for the without-projection group outperform the ones for the with-projection group. This is consistent with the U-shape in Z-scores that we found in Table 1.19b that the third year after emerging from Chapter 11 might be critical for the without-projection group.

Table 1.22 reports the duration differences between the with- and without-projection groups. Both groups have some extreme maximum duration numbers. For example, the longest duration of all firms for the with-projection group reaches 2,235 days, more than 6 years. Accordingly, we focus on the medians. For the without-projection group, the median duration of all firms is 390 days, compared to 211 days for the with-projection group. Median durations for manufacturing firms are 405 days for the without-projection group, compared to 264 for the with-projection group. For non-manufacturing firms, we obtain 390 for without-projection group compared with 195 for with-projection group. Hence, all the median durations for the without-projection group are longer than those of the with-projection group. These results suggest that approval of a reorganization plan lacking detailed projection information is more difficult.

Table 1.23a and 1.23b show the post-Chapter 11 5-year excess return and duration between with- and without- projection groups. We found that the overall long duration group of with-projection firms offers some significant positive excess returns in the short-term, one year after emergence. However, short and long duration groups do differ for

with-projection firms. The excess returns for the without-projection group are similar. We do not find significant group difference, or any short-term excess returns for either one of the duration groups, indicating that the duration effect is not obvious in the excess returns between different duration groups.

In addition to the Z-score model's liquidity, profitability, productivity, solvency and turnover variables, another important factor for distress firms is leverage (total liabilities divided by total assets). In Table 1.24, we compare the leverage in pre- and post-Chapter 11 for both with- and the without-projection groups. We find that for both groups the overall leverage decreases from pre- to post-Chapter 11, indicating a certain level of debt relief. The median leverage of all firms are similar between these two groups, from 0.846 pre-Chapter 11 to 0.727 post-Chapter 11 for with-projection group, and from 0.840 to 0.743 for the without-projection group. The decreases are -0.118 and -0.098 of all firms in with- and without-projection group respectively, which are significant at least at 5% level.

Table 1.25 compares the leverage across two groups for both pre- and post-Chapter 11 period. We find no significant differences between two groups in both pre- and post-Chapter 11. However, manufacturing firms in the with-projection group have the higher leverage before Chapter 11, 0.133 higher in median which is significant at 5% level. After Chapter 11, the situation continues, in which the leverage for manufacturing firms in with-projection group is 0.329 higher in median compared to the one in the without-projection group. For non-manufacturing firms, the leverage of with-projection groups is 0.045 higher than the one of without-projection group.

We examine leverage for 5 years before and after Chapter 11 for these two groups and display the results in Table 1.26a and 1.26b respectively. We find that leverage increases as the firms approach a Chapter 11 filing for both groups. In all firms, the with-projection group has higher leverage in pre-2 and pre-3 compared to without-projection group, but the difference disappears one year before bankruptcy, when both groups suffer from higher a leverage burden. Particularly in manufacturing firms, the higher leverage in the with-projection group persists for up to four years before bankruptcy, while the differences are insignificant for non-manufacturing firms. Table 1.26b contains the post-Chapter 11 results. Comparing the medians, the with-projection group shows a certain level of leverage improvement post-Chapter 11. For example, for all firms, the leverage is 1.028 one year before bankruptcy, but it decreases to 0.690 in the year after emergence from bankruptcy. We can see that decrease in leverage for the with-projection group for all firms, manufacturing firms, and non-manufacturing firms in the post-Chapter 11 period. However, the decrease in the without-projection group is not obvious. For all firms, two groups do not show a significant difference in both mean and median leverage for up to five year after bankruptcy. For manufacturing firms, both groups have a comparable level of leverage. For non-manufacturing firms, the with-projection group has lower leverage than the without-projection group for up to two years after Chapter 11. Therefore, the year by year results show that the higher leverage in the with-projection group in pre-Chapter 11 disappears in the post-Chapter 11 period such that the leverage is comparable for all firms between two groups, or even lower in non-manufacturing firms.

In Table 1.27, we report similar tests regarding the excess return ($ER_{i,t} = r_{i,t} - r_{mkt,t)}$ where $ER_{i,\,t}$ is the excess return for company i at time t, $r_{i,t}$ is the absolute return for

company i at time t, and $r_{mkt,t}$ is the market (S&P 500) return at time t. We collect the monthly return information for our sample from CRSP. The excess return results are mixed. Our objective is to check the performance over time in each group. All the mean and median excess returns in pre-Chapter 11 for both with- and without-projection groups are negative, and significantly different from zero. Their post-performance is not distinguishable from zero. However, the pre- to post-Chapter 11 improvement for each individual group is substantial. The differences in both mean and median are significantly positive at least at 10% level.

In Table 1.28, we compare between with- and without-projection group in both pre- and post-Chapter 11 period. The only significant results in group comparison are the mean difference in pre-Chapter 11. Therefore, even though for each group, they improved significantly throughout Chapter 11, the overall performance between different groups seems not substantial.

In Table 1.29a, we decompose the excess return into the five individual years before the Chapter 11 filing. Both groups' mean and median excess returns are not only negative but also decreasing as they approach Chapter 11. For the with-projection group, the median excess return decreases from -53.1% two years before bankruptcy to -77.9% one year before bankruptcy. For the without-projection group, the excess return changes from -71.2% two years before their bankruptcy filing to -74.5% one year before the bankruptcy filing. The mean and median differences between two groups are significantly positive two years before the bankruptcy filing, but they both suffer from poor performance one year before the filing, indicating that the stock performance of the with-projection group did not outperform the without-projection group before Chapter 11.

Table 1.29b shows the excess return results in the post-Chapter 11 period. The with-projection group reports a large positive excess return in the first year after Chapter 11, 38.1% for all firms, which is significant at the 1% level and 41.6% for non-manufacturing firms, which is significant at 5% level. The median numbers show the same pattern. This result is consistent with Eberhart, Altman, and Aggarwal (1999) who find that the firms emerging from Chapter 11 generally offer a positive excess return in the 200 days following emergence. On the other hand, the favorable performance is not sustainable in the long run. For all the following years, the results are not different from zero. This second result is consistent with Alderson and Better (1999). They find that the reorganized firms on average neither underperform nor outperform S&P500 index over the five years after emerging. In group comparison, the with-projection group did a better job compared to the without-projection group also in the short-run, as the mean and median difference between groups are significant one year after emergence. However, all the other mean and median differences between the two groups are not significantly different from zero for the remaining four years after Chapter 11.

Even though the results show improvement and some positive median excess returns, especially for the with-projection group, we need to be cautious as the raw excess returns reported here are not risk-adjusted. Firms that file and then emerge from Chapter 11 are usually viewed as quite risky.

Starting from Table 1.30, we show Sharpe ratio results in order to take risk into account. The Sharpe ratio results are consistent with the excess return results. Both groups did make some significant improvements throughout the restructuring process, shown in the medians.

We decompose the Sharpe ratio into the 5 years before bankruptcy in Table 1.31a. The results show that these ratios are decreasing for both the with- and without-projection groups as they approach the filing. The without-projection group experiences some significant negative Sharpe ratios as they approach filing Chapter 11, while the Sharpe ratios for the with-projection are not distinguishable from zero. Again, the with-projection group did not outperform without-projection one year before the official filings.

When we compare the post-Chapter 11filing date Sharpe ratios of two groups in Table 1.31b, we find that, the with-projection group still enjoy significant positive Sharpe ratios in the short-term, but not the without-projection group, which is consistent with the excess return results shown in Table 1.29b . However, when we take risk into consideration, the evidence of the difference between two groups is weaker. Now only the difference in medians between two groups shows some evidence of better performance for the with-projection group, at a 10% level of significance. This weak advantage also disappears in the following years.

Besides the Sharpe ratio, we also take a look at the Treynor ratio starting in Table 1.32. Treynor ratio is similar to the Sharpe ratio in that both of them are measures of excess return per unit of risk. The risk in Sharpe ratio is measured by the volatility, while in Treynor ratio it is measured by beta. The big picture in the Treynor ratio is consistent with that of the Sharpe ratio. The overall results in Table 1.32 show that Treynor ratios are negative for both groups pre-Chapter 11, -0.137 of all firms in the with-projection group and -0.205 of all firms in the without-projection group. Comparing the mean and median differences, we see some signs of improvement for all firms, 0.621 improvement

in means for with-projection group and 0.222 improvement in medians for without-projection group, which are significant at least at 10% level.

In Table 1.33a and 1.33b, we decompose the Treynor ratio into five years pre- and post-Chapter 11. Both mean and median Treynor ratios show the deterioration over the five years before Chapter 11. For the with-projection group, the Treynor ratios are even lower than the ones for without-projection group. We find that for all firms, the with-projection group has a significantly lower Treynor ratio, -2.773 in means, than the without-projection group, and the difference comes from the non-manufacturing firms.

On the other hand, post-Chapter 11, the with-projection group did the better job, mainly in the first two years after emergence from Chapter 11. In the first year in post-Chapter 11 period, the Treynor ratio of all firms in the with-projection group is -0.025, compared to -0.220 for the without-projection group, with a significant advantage of 0.195 higher in medians. However, as we have found in previous analysis, the advantage is not sustainable over the next few years. The difference between Treynor and Sharpe ratio results is that although we see some improvement after Chapter 11, the short-term abnormal return phenomenon is not strong in the Treynor ratio results. However, the path of Treynor ratio in the five years after emergence is consistent with the Sharpe ratio. That is, for the with-projection group, the performance is ok in the first two years after emergence, but in the long term, we get negative Treynor ratios from the third year after Chapter 11, indicating the long-term distress continues. For the without-projection group, the first year Treynor ratio is not as good as the one for with-projection group. In the long term, it has no consistent pattern. Therefore, the with-projection group still outperforms the without-projection group, especially in the short term.

In summary, when we compare all these tables between the with- and without-projection groups, we find that in both pre- and post-Chapter 11 periods, the with-projection group outperforms the without-projection group with strong evidence in the Z-scores and some evidence in the excess returns, Sharpe and Teynor Ratios. Thus a company that files detailed projection information provides a signal to the market that it has probably put in place an effective reorganization plan designed to improve its performance. Therefore, the projection information acts like a roadmap for the reorganized company. It may help them to emerge as a stronger company.

1.7 Regression Tests

In this section, we run a regression on the excess returns against some variables we investigated above.

$$\text{Excess Return} = \alpha + \beta_1 * \text{Firm Characteristic} + \beta_2 * \text{Chapter 11 Characteristic} + \beta_3 * \text{Duration} \quad (3)$$

where, firm characteristic is a dummy variable which takes the value of one if the firm is a manufacturer and zero otherwise. Chapter 11 characteristic is also a dummy variable which takes the value of one if the company has a projection in its reorganization plan and zero otherwise. For duration, we use the log of number of days in Chapter 11.

Table 1.34 contains the results of our regression tests. The dependent variable is the post-Chapter 11 excess return for all years, which is a function of duration and two dummy variables that we have looked into in the previous analysis. Curiously, none of these three variables are significant in explaining the excess return in the post-Chapter 11

period. The R square, 0.0022, is very low. It shows that for all years of data, not much can be explained using our three variables alone.

In Table 1.35, we repeat the above regression test, but using only the first year excess return after emergence, as we find some large positive excess returns in the short term in previous analysis. As we can see from the results, all the t-values of our three parameters increase when using the first year after emergence data. The most obvious one is for Chapter 11 characteristics, for which 1 represents firms with complete projection information, and 0 otherwise. It is marginally significant at 10% level. That is, among manufacturing or non-manufacturing, with projection or without projection, and the length of the duration, the projection dummy is the most significant variable in explaining the first year excess return in post Chapter 11. The R square increases to 0.0559, indicating about 5.5% can be explained by the marginally significant variable, Chapter 11 characteristics. However, the other two variables are still insignificant.

In Table 1.36, we use the market model to estimate the beta for our samples. Beta is a measure of systematic risk designed to capture the volatility of one stock relative to market volatility. We regress the monthly returns for each firm-year observation against the S&P 500 monthly return. Most of our results are in the range of 1 to 2. If we compare the pre-Chapter 11 beta and post-Chapter 11 beta, we find that all the betas decrease from their pre-Chapter 11 levels. For example, for all the firms with a projection, the beta before Chapter 11 is 1.37, and it decreases to 1.27 after Chapter 11. For all the firms without a projection, the beta also decreases from 1.36 to 1.04. The good news is that a successful reorganization can help to stabilize the business and operation, which can

further help to decrease the risks of the stocks. However, the bad news is that the amount of the alleviation in the risks is limited.

1.8 Conclusion

We analyze the firms that emerged from Chapter 11 as a public companies and the quality of the projection information contained in the disclosure statements submitted during Chapter 11. The overall results show that the performance improved from pre-Chapter 11 to post-Chapter 11. However, based on the Z-scores, the performance has generally not reached the safe zone. We show that the post-bankruptcy performance tends to be in line with the projections contained in the disclosure statement. The significant and negative error terms indicate that the projections are usually optimistic. Moreover, we show that leverage and liquidity are the most important factors in the success of the reorganization, but size is not a significant factor.

We also analyze the duration effect during the Chapter 11, as duration itself may serve as a proxy for the quality of the reorganization plan. We find that the short duration group shows a stronger positive correlation between the projected information and the actual post-bankruptcy performance, especially for non-manufacturing firms. Firm size is also related to duration, as larger firms tend to spend more time in Chapter 11. However, duration does not have a strong influence on the stock performance, as the excess returns do not behave significantly between short duration and long duration group.

The presence of complete projection information also serves as a proxy for the effectiveness of the reorganization plan. We compare our sample with those firms that also emerged as public firms but did not provide, or provided incomplete projection

information in Chapter 11. We find that the Z-scores are higher for the with-projection group in both pre- and post-Chapter 11 periods. Duration is shorter for the with-projection group and the decrease in leverage is greater for the with-projection group during Chapter 11. Regarding the stock performance after emergence, we find that the with-projection group provides positive excess return in the first year after emergence, but not in the long term.

Figure 1.1 Time Line

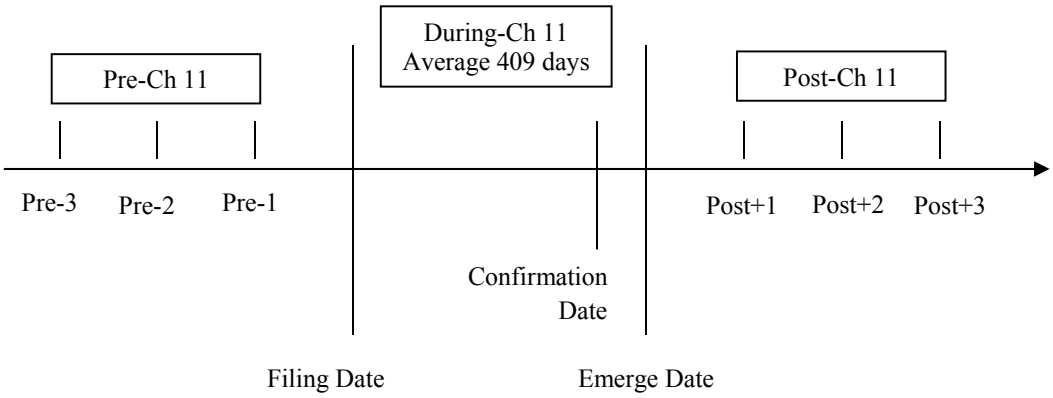

Figure 1.2a Histograms of Deviation between Actual and Projected Post-Chapter 11 Z-scores: All Firms

The percentage is the level of deviation between actual Z-score and its projected level, which is ((actual Z-score /projected Z-score) – 1) *100%.

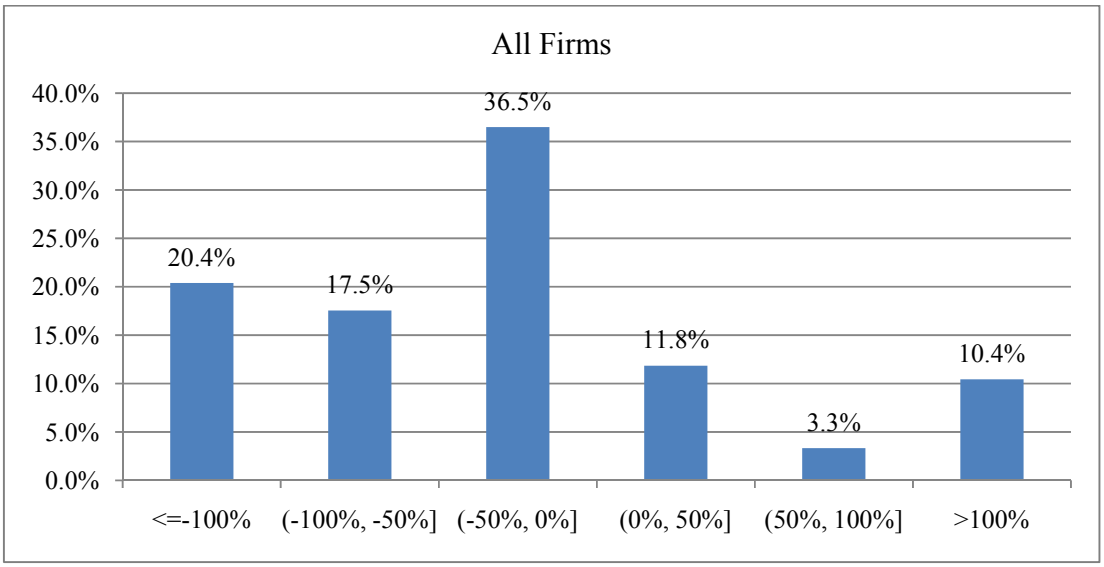

Figure 1.2b Histograms of Deviation between Actual and Projected Post-Chapter 11 Z-scores: Manufacturing Firms

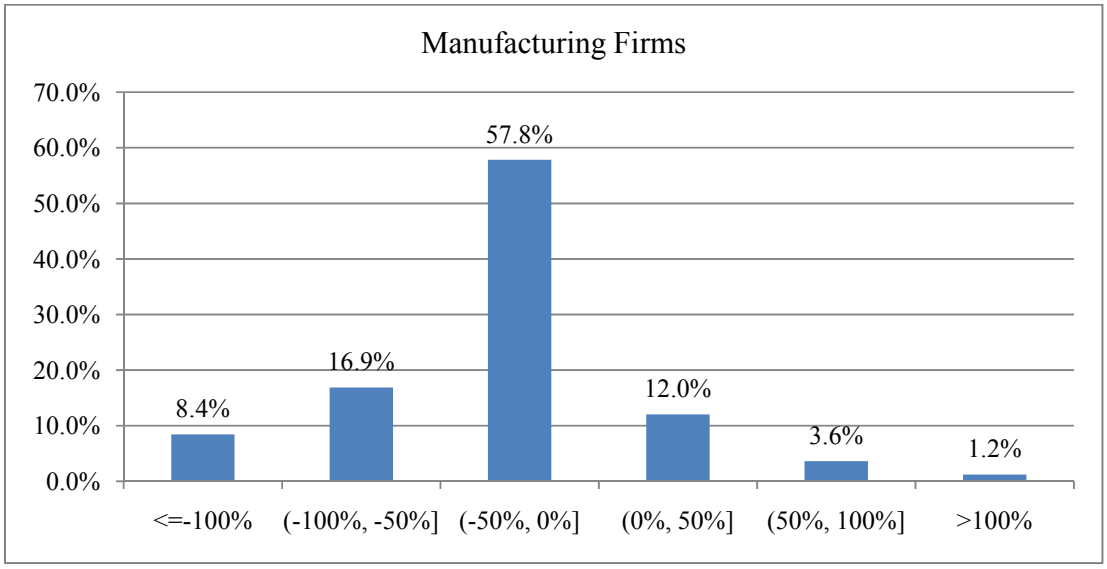

Figure 1.2c Histograms of Deviation between Actual and Projected Post-Chapter 11 Z-scores: Non-Manufacturing Firms

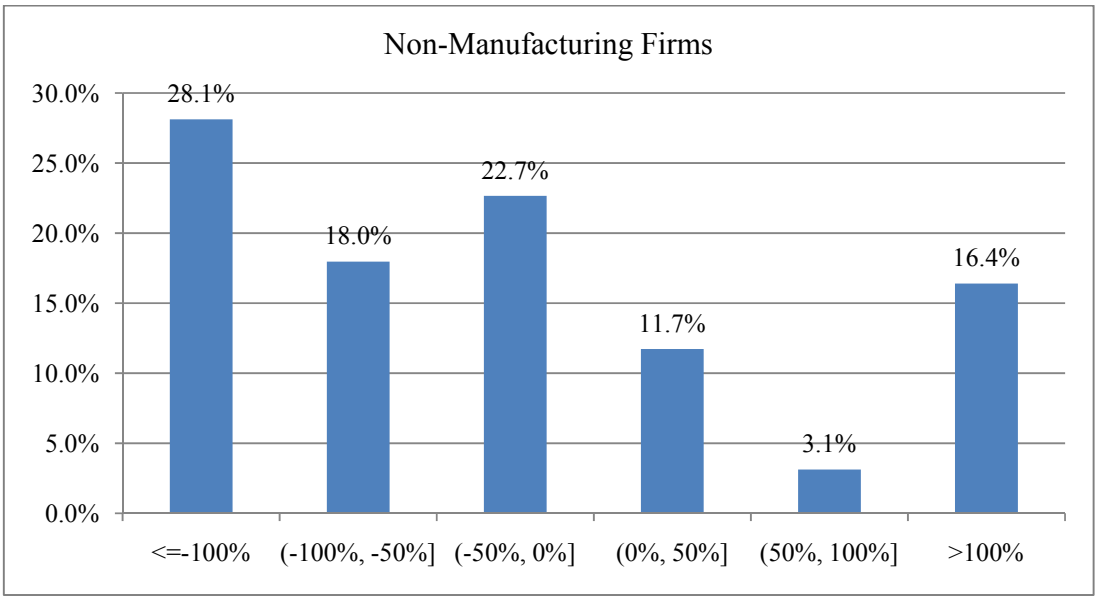

Table 1.1 Sample

The sample consists of the bankruptcy filings with liabilities of $100 million or more at default between 1978 and 2008. We restricted our sample period to 1986 to 2008 as the New Generation Research database begins with 1986 thereby excluding 68 firms that filed before 1986.

Year of Filing	Number of Firms	Percentage
1978-1985	68	4.7%
1986-2008	1385	95.3%
Total	1453	100.0%

Table 1.2 Bankruptcy Filing Outcomes

Bankruptcy outcomes are classified into six groups: acquired/purchased, liquidated, convert to Chapter 7, reorganized, dismissed and undetermined. Acquired/purchased firms sell substantially all of its assets to a single buyer while in bankruptcy. Undetermined outcomes are those for which the result is unknown or the firm remained in Chapter 11as of year end 2008. We focus on the firms that successfully emerged from Chapter 11 as public companies listed in NYSE, NASDAQ, AMEX, or OTC markets.

Outcome	Number of Firms	Percentage
Acquired/Purchased	110	7.9%
Liquidated	199	14.4%
Convert to Chapter 7	87	6.3%
Reorganized	681	
- public firms	254	18.3%
- private firms	139	10.0%
- others	288	20.8%
Dismissed	42	3.0%
Undetermined	266	19.2%
Total	1385	100.0%

Table 1.3 Final Samples and Firm-Year Observations

Firms must also have complete projection information in their plan of reorganization and disclosure statement and both pre-Chapter 11 and post-Chapter 11 accounting information in the Compustat database. We further divide our sample into manufacturing and non-manufacturing firms based on their SIC code. If its SIC code is between 2000 and 3999, the firm is classified as a manufacturer. Otherwise, non-manufacturer. Based on Compustat and SEC, we also collect accounting information for 5 years before and after the Chapter 11 filing (if not, then we just use the number of years available in the database), which gives us total of 1298 firm-year observations.

Category	Number of Firms	Percentage	Number of Firm Year Observations	Percentage
Manufacturing Firms	33	37.9%	506	39.0%
Non-manufacturing Firms	54	62.1%	792	61.0%
Total	87	100.0%	1298	100.0%

Table 1.4a Descriptive Statistics for All Firms

We collect eight variables for each firm in our sample, including total assets, total liabilities, market equity, book value of equity, working capital, retained earnings, sales, EBIT, and net income. We obtain the data mainly from Compustat, and hand collect the rest from 10-K filings. Market equity equals the number of common shares outstanding at the end of fiscal year, times the closing price of its common shares at the last day of its fiscal year. All the numbers are in thousands.

Variables	N	Mean	Median	Minimum	Maximum	Std dev
				Pre-Chapter 11		
Total Assets	87	2,749,521	817,934	2,077	50,336,420	6,610,126
Total Liabilities	87	2,345,184	881,161	870	45,566,820	5,818,432
Market Equity	87	1,029,159	245,671	-14,465	15,070,497	2,097,580
Book Value of Equity	87	381,935	89,860	-1,087,637	6,896,918	1,117,269
Working Capital	87	384,478	11,027	-2,503,600	39,596,700	4,360,893
Retained Earnings	87	-232,886	-105,749	-2,540,020	1,531,900	602,214
Sales	87	1,594,736	607,659	164	17,691,200	3,016,624
EBIT	87	37,321	19,056	-612,115	1,424,940	234,095
Net Income	87	-132,196	-37,580	-1,526,200	182,000	264,709
				Post-Chapter 11		
Total Assets	87	2,328,973	548,481	8,412	32,423,000	5,714,640
Total Liabilities	87	1,700,847	434,381	429	27,793,475	4,489,060
Market Equity	87	936,324	324,217	-12,530	8,364,344	1,551,117
Book Value of Equity	87	622,210	126,294	-298,121	10,113,000	1,471,679
Working Capital	87	455,558	37,060	-1,884,000	27,072,000	2,978,321
Retained Earnings	87	-113,395	-32,648	-4,540,000	804,180	556,112
Sales	87	1,629,153	549,415	1,528	20,098,000	3,279,971
EBIT	87	79,184	23,337	-292,700	1,015,000	207,560
Net Income	87	41,997	-702	-460,100	1,929,500	290,428

Table 1.4b Descriptive Statistics for Manufacturing Firms

Variables	N	Mean	Median	Minimum	Maximum	Std dev
				Pre-Chapter 11		
Total Assets	33	910,487	618,968	15,544	4,753,000	989,298
Total Liabilities	33	904,392	614,935	21,729	5,361,800	1,023,653
Market Equity	33	411,863	157,796	13,978	2,387,408	631,294
Book Value of Equity	33	5,308	3,272	-782,400	752,900	279,009
Working Capital	33	-17,415	27,249	-1,262,600	282,940	247,184
Retained Earnings	33	-204,258	-76,237	-1,576,613	1,229,840	472,245
Sales	33	938,065	681,025	4,358	4,374,800	956,489
EBIT	33	61,715	30,266	-108,476	507,200	120,754
Net Income	33	-38,674	-29,731	-317,150	131,400	75,841
				Post-Chapter 11		
Total Assets	33	1,011,002	513,781	10,487	7,872,000	1,614,020
Total Liabilities	33	660,550	434,381	5,887	3,847,000	802,670
Market Equity	33	571,249	161,063	1,241	3,545,035	953,225
Book Value of Equity	33	346,318	78,221	-298,121	3,988,000	847,915
Working Capital	33	155,168	98,684	-85,230	939,900	231,489
Retained Earnings	33	-78,915	-14,884	-670,641	329,053	224,837
Sales	33	1,035,191	549,415	14,514	5,202,000	1,314,563
EBIT	33	53,420	30,420	-108,150	300,000	79,270
Net Income	33	9,890	8,290	-82,184	113,150	46,923

Table 1.4c Descriptive Statistics for Non-Manufacturing Firms

Variables	N	Mean	Median	Minimum	Maximum	Std dev
				Pre-Chapter 11		
Total Assets	33	1,011,002	513,781	10,487	7,872,000	1,614,020
Total Liabilities	33	660,550	434,381	5,887	3,847,000	802,670
Market Equity	33	571,249	161,063	1,241	3,545,035	953,225
Book Value of Equity	33	346,318	78,221	-298,121	3,988,000	847,915
Working Capital	33	155,168	98,684	-85,230	939,900	231,489
Retained Earnings	33	-78,915	-14,884	-670,641	329,053	224,837
Sales	33	1,035,191	549,415	14,514	5,202,000	1,314,563
EBIT	33	53,420	30,420	-108,150	300,000	79,270
Net Income	33	9,890	8,290	-82,184	113,150	46,923
				Post-Chapter 11		
Total Assets	54	3,873,376	1,010,885	2,077	50,336,420	8,180,202
Total Liabilities	54	3,225,668	929,733	870	45,566,820	7,226,207
Market Equity	54	1,389,249	311,990	-14,465	15,070,497	2,536,267
Book Value of Equity	54	612,097	173,168	-1,087,637	6,896,918	1,355,076
Working Capital	54	644,526	588	-2,503,600	39,596,700	5,599,481
Retained Earnings	54	-250,710	-133,540	-2,540,020	1,531,900	674,336
Sales	54	1,996,035	508,872	164	17,691,200	3,712,294
EBIT	54	22,414	8,527	-612,115	1,424,940	281,993
Net Income	54	-189,349	-58,771	-1,526,200	182,000	318,517

Table 1.5 Firm Characteristics in One Year before Bankruptcy

Total assets, net income and book equity are in thousands. We use working capital divided by total assets as liquidity measure, total liabilities divided by total assets as leverage measure, net income divided by sales as profitability measure and book value of equity divided by total assets as solvency measures.

	All Firms		Manufacturing Firms		Non-Manufacturing Firms		Mean Diff	Median Diff
	Mean	Median	Mean	Median	Mean	Median	Manu - Non-Manu	Manu - Non-Manu
Total Assets	2066213	831838	1034859	461152	2705652	1040827	-1670793***	-579675**
Net Income	-392617	-105563	-104444	-76008	-571285	-156135	466841***	80127**
Book Equity	-12772	-11630	-110668	-55936	47923	15378	-158591	-71314*
Liquidity	-0.325	-0.096	-0.331	-0.238	-0.322	-0.083	-0.010	-0.155
Leverage	1.132	1.028	1.228	1.122	1.072	0.944	0.156*	0.178**
Profitability	-0.538	-0.178	-0.204	-0.122	-0.746	-0.371	0.541***	0.249**
Solvency	-0.141	-0.028	-0.225	-0.122	-0.089	0.040	-0.136	-0.162**

Table 1.6 Z-score: Pre vs. Post-Chapter 11

The Z-score is calculated based on Altman's Z-score model, which comes in two versions. One is for manufacturing, and the other is for non-manufacturing firms. "*", "**", and "***" represent significance level at 10%, 5%, and 1% respectively.

	Mean		Diff	Median		Diff
	Pre	Post	Post - Pre	Pre	Post	Post - Pre
All Firms	-1.815	2.521*	4.335***	0.328	1.330***	1.002***
Manufacturing	0.788*	0.632	-0.157	0.973***	1.997 ***	1.024*
Non-Manufacturing	-3.406	3.675	7.080**	-0.129	0.662 ***	0.791***

Table 1.7 Change in Z-score

We calculate the change in our Z-score, which is defined as the difference between post-Chapter 11 Z-score and pre-Chapter 11 Z-score. Four possible scenario are: Above-to-above, the case when a firm's Z-score is above the median in pre-Chapter 11 and remains above the median after Chapter 11; Above-to-below, the case when a firm's Z-score is above the median in pre-Chapter 11, but falls below the median after Chapter 11; Below-to-below, the case when a firm's Z-score is below the median in pre-Chapter 11 period and stays below the median after Chapter 11; Below-to-above, the case when a firm's Z-score is below the median in pre-Chapter 11 period but changes to above the median level after Chapter 11. The first line for each firm category represents the number of firms that changes in different scenarios, and the second line is the change in the Z-score. The numbers in the parenthesis are the p-values. "*", "**", and "***" represent significance level at 10%, 5%, and 1% respectively.

	Above to Above	Above to Below	Below to Below	Below to Above	Total Firms
All Firms	27	17	27	16	87
	1.392***	-1.145***	1.484***	5.672***	
	(0.0006)	(0.0058)	(0.0074)	(<.0001)	
Manufacturing Firms	10	7	10	6	33
	0.794	-0.541	0.658	3.026**	
	(0.1321)	(0.2150)	(0.4120)	(0.0103)	
Non-Manufacturing Firms	14	13	14	13	54
	2.316***	-1.274***	2.171**	5.676***	
	(0.0024)	(0.0061)	(0.0169)	(0.0003)	

Table 1.8a Decomposition of the Change in Z-scores for All Firms

We decompose the Z-scores into several factors. The "diff" represents the difference of each factor between the post-Chapter 11 level and the pre-Chapter 11 level. We define leverage as total liabilities divided by total assets. WC/TA is working capital divided by total assets, which is a liquidity measure. RE/TA is retained earnings divided by total assets, which is profitability measure. EBIT/TA is earnings before interest and taxes divided by total assets, which is a productivity measure. MktEquity/TL is market value of equity divided by total liabilities, which is a solvency measure in the Z-score model for manufacturing firms. Sales/TA is sales divided by total assets, which is a turnover measure in the Z-score model for manufacturing firms. BookEquity/TL is book value of equity divided by total liabilities, which is a solvency measure in the Z-score model for nonmanufacturing firms. Size is the measured in thousands. Duration is the days a firm spent between bankruptcy filing date and the effective date.

All Firms	Z_diff	Leverage_diff	WC/TA_diff	RE/TA_diff	EBIT/TA_diff	Size_diff	Duration
Above to Above	1.392***	-0.143**	0.151***	-0.091	0.014	-1000874	522
	(0.0006)	(0.0103)	(<.0001)	(0.2824)	(0.5840)	(0.1757)	
Above to Below	-1.145***	0.242	-0.240	-1.367	-0.010	-224266	577
	(0.0058)	(0.3354)	(0.2320)	(0.3000)	(0.5792)	(0.7869)	
Below to Below	1.484***	-0.077	0.002	0.410	0.314	-55214	286
	(0.0074)	(0.2574)	(0.9580)	(0.2330)	(0.3108)	(0.8940)	
Below to Above	5.672***	-0.498***	0.274***	0.598**	0.130***	-266297	262
	(<.0001)	(<.0001)	(0.0028)	(0.0157)	(0.0080)	(0.7105)	

Table 1.8b Decomposition of the Change in Z-scores for Manufacturing Firms

Manufacturing Firms	Z_diff	Leverage_diff	WC/TA_diff	RE/TA_diff	EBIT/TA_diff	MktEquity/TL_diff	Sale/TA_diff	Size_diff	Duration
Above to Above	0.794	-0.059	0.138**	-0.097	0.035	0.547*	0.221	202654	694
	(0.1321)	(0.5203)	(0.0213)	(0.3805)	(0.5768)	(0.0723)	(0.1130)	(0.4607)	
Above to Below	-0.541	0.020	0.046	-0.390	-0.017	-0.051	0.087	391025	668
	(0.2150)	(0.9102)	(0.6452)	(0.1348)	(0.4181)	(0.8179)	(0.6176)	(0.4369)	
Below to Below	0.658	0.255	-0.330	-2.072	0.019	-0.080	0.198	-70903	362
	(0.4120)	(0.5553)	(0.3253)	(0.3720)	(0.6627)	(0.6772)	(0.3158)	(0.3939)	
Below to Above	3.026**	-0.467**	0.328	0.889	0.114	0.642**	0.553**	-122948	291
	(0.0103)	(0.0318)	(0.1105)	(0.1792)	(0.2349)	(0.0226)	(0.0252)	(0.5221)	

Table 1.8c Decomposition of the Change in Z-scores for Manufacturing Firms, with Coefficients

Manufacturing Firms	Z_diff	1.2*WC/TA_diff	1.4*RE/TA_diff	3.3*EBIT/TA_diff	0.6*MktEquity/TL_diff	1.0*Sale/TA_diff
Above to Above	0.794	0.166**	-0.136	0.117	0.328	0.221
	(0.1321)	(0.0213)	(0.3805)	(0.5768)	(0.0723)	(0.1130)
Above to Below	-0.541	0.055	-0.546	-0.057	-0.031	0.087
	(0.2150)	(0.6452)	(0.1348)	(0.4181)	(0.8179)	(0.6176)
Below to Below	0.658	-0.396	-2.901	0.062	-0.048	0.198
	(0.4120)	(0.3253)	(0.3720)	(0.6627)	(0.6772)	(0.3158)
Below to Above	3.026**	0.393	1.244	0.376	0.385**	0.553**
	(0.0103)	(0.1105)	(0.1792)	(0.2349)	(0.0226)	(0.0252)

Table 1.8d Decomposition of the Change in Z-scores for Non-manufacturing Firms

Non-Manufacturing Firms	Z_diff	Leverage_diff	WC/TA_diff	RE/TA_diff	EBIT/TA_diff	BookEquity/TL_diff	Size_diff	Duration
Above to Above	2.316***	-0.177*	0.129*	0.005	-0.002	0.339	-1578752	268
	(0.0024)	(0.0767)	(0.0539)	(0.9363)	(0.9324)	(0.2750)	(0.3003)	
Above to Below	-1.274***	0.061	-0.053*	-0.177**	0.002	-0.078	-1385537	424
	(0.0061)	(0.3828)	(0.0694)	(0.0243)	(0.8903)	(0.4956)	(0.1413)	
Below to Below	2.171**	-0.166	0.006	0.851	0.583	0.422*	288855	348
	(0.0169)	(0.1412)	(0.8490)	(0.1817)	(0.3393)	(0.0955)	(0.7051)	
Below to Above	5.676***	-0.392***	0.221***	0.344***	0.117**	1.263***	-294932	344
	(0.0003)	(0.0001)	(0.0013)	(0.0031)	(0.0131)	(0.0023)	(0.7396)	

Table 1.8e Decomposition of the Change in Z-scores into for Non-manufacturing Firms, with Coefficients

Non-Manufacturing Firms	Z_diff	6.56*WC/TA_diff	3.26*RE/TA_diff	6.72*EBIT/TA_diff	1.05*BookEquity/TL_diff
Above to Above	2.316***	0.848*	0.015	-0.012	0.356
	(0.0024)	(0.0539)	(0.9363)	(0.9324)	(0.2750)
Above to Below	-1.274***	-0.347*	-0.576**	0.012	-0.081
	(0.0061)	(0.0694)	(0.0243)	(0.8903)	(0.4965)
Below to Below	2.171**	0.037	2.775	3.916	0.443*
	(0.0169)	(0.8490)	(0.1817)	(0.3393)	(0.0955)
Below to Above	5.676***	1.451***	1.121***	0.788**	1.327***
	(0.0003)	(0.0013)	(0.0031)	(0.0131)	(0.0023)

Table 1.9 Correlations between Actual and Projected Post Chapter 11 Z-scores

	Correlation
All Firms	0.14**
	(0.0438)
Manufacturing Firms	-0.15
	(0.1656)
Non-Manufacturing Firms	0.22**
	(0.0118)

Table 1.10 Univariate Test Regarding the Prediction Error

The prediction error is defined as the difference between post-Chapter 11 Z-score and projected Z-score.

	Mean Error
All Firms	-0.66***
	(<.0001)
Manufacturing Firms	-1.32**
	(0.0286)
Non-Manufacturing Firms	-0.52**
	(0.0179)

Table 1.11 Duration for All Groups

Duration is the days a firm spent between bankruptcy filing date and the effective date.

	Mean	Median	Maximum	Minimum
All Firms	409	266	2217	33
Manufacturing Firms	522	298	2217	37
Non-Manufacturing Firms	336	250	1257	33

Table 1.12 Correlations between Actual and Projected Post Chapter 11 Z-scores: Short vs. Long Duration

If the firm has a duration that is greater than its group median, that firm has a long duration. Otherwise, it has a short duration.

	Correlation	
	Short Duration	Long-Duration
All Firms	0.318***	-0.041
	(0.0007)	(0.6826)
Manufacturing Firms	0.391**	-0.288*
	(0.0153)	(0.0554)
Non-Manufacturing Firms	0.306***	0.092
	(0.0094)	(0.4957)

Table 1.13 Univariate Test of Prediction Error: Short vs. Long Duration

Prediction mean error is the difference between the actual post Chapter 11 Z-score and the projected Z-score. Diff is the difference between short duration and long duration.

	Mean Error		
	Short Duration	Long Duration	Diff
All firms	-0.541**	-1.401***	0.860**
	(0.0405)	(<.0001)	(0.0443)
Manufacturing	-0.540*	-2.073***	1.533***
	(0.0546)	(<.0001)	(0.0071)
Non-Manufacturing	-0.538	-0.846*	0.308
	(0.1647)	(0.0589)	(0.5976)

Table 1.14 Size and Duration

	Overall	Q1 (25%)	Q2 (50%)	Q3 (75%)	Q4
			Mean		
All Firms	409	354	276	328	679
Manufacturing Firms	522	438	208	328	1037
Non-Manufacturing Firms	336	291	313	242	489
			Median		
All Firms	266	258	162	298	491
Manufacturing Firms	298	258	158	298	751
Non-Manufacturing Firms	250	216	212	195	415

Table 1.15 Post-Chapter 11 Excess Stock Return: Short vs. Long Duration

Excess return is the difference between the stock return of each firm in each year and the S&P 500 return in the same year. Post+1, post+2, post+3, post+4, and post+5 are 1 year, 2 years, 3 years, 4 years and 5 years after emerging from Chapter 11.

		Mean		Mean Diff	Median		Median Diff
		Short	Long	Short - Long	Short	Long	Short - Long
All Firms		8.6%	3.4%	5.2%	-5.9%	0.6%	-6.6%
	post+1	24.2%	49.2%***	-24.9%	15.5%	18.7%**	-3.2%
	post+2	0.3%	- 8.2%	8.5%	2.1%	-8.1%	10.2%
	post+3	-3.8%	4.0%	-7.8%	-11.2%	-2.7%	-8.5%
	post+4	7.1%	-4.0%	11.1%	-21.9%	-19.8%	-2.0%
	post+5	3.7%	-7.1%	10.9%	-9.0%	-8.9%	0.0%
Manufacturing		19.4%*	-3.2%	22.6%	22.2%*	-7.7%	29.9%
	post+1	31.4%	31.9%	-0.5%	22.4%	-6.2%	28.6%
	post+2	16.0%	-15.2%	31.2%	40.4%	-26.9%	67.2%
	post+3	37.8%	-16.4%	54.1%*	6.6%	-17.6%	24.2%
	post+4	19.5%	12.7%	6.8%	-17.9%	-6.6%	-11.3%
	post+5	4.2%	1.2%	3.0%	-10.3%	-5.1%	-5.2%
Non-Manufacturing		6.8%	3.6%	3.2%	-6.2%	-1.1%	-5.1%
	post+1	31.7%	50.9%**	-19.2%	15.5%	18.7%*	-3.2%
	post+2	-8.5%	-3.2%	-5.3%	-13.7%	-4.4%	-9.3%
	post+3	-15.8%	5.6%	-21.4%	-26.4%*	-6.2%	-20.2%*
	post+4	-1.1%	-13.9%	12.8%	-25.2%	-27.4%*	2.2%
	post+5	3.8%	-14.2%	18.0%	-8.3%	-13.7%	5.4%

Table 1.16 Number of Days between the Conformation Date and Effective Date

	Mean	Median	Maximum	Minimum
All Firms	37	22	348	1
Manufacturing Firms	27	22	131	3
Non-Manufacturing Firms	42	22	348	1

Table 1.17 Excess Stock Return between the Confirmation Date and Effective Date

	Daily Excess Return				
	N	Mean	Median	Maximum	Minimum
All Firms	7	0.22%	-0.02%	7.07%	-6.15%
Manufacturing Firms	3	-1.82%	-0.81%	1.46%	-6.10%
Non-Manufacturing Firms	4	1.75%	0.22%	6.73%	-0.19%

Table 1.18 With- vs. Without-Projection: Overall Z-score

"W Proj" represents the group of firms with projection information, and "W/O Proj" represents the group of firms that did not provide projection information during Chapter 11 process. Pre-1, pre-2, pre-3, pre-4, and pre-5 are 1 year, 2 years, 3 years, 4 years and 5 years before Chapter 11 filing. Post+1, post+2, post+3, post+4, and post+5 are 1 year, 2 years, 3 years, 4 years and 5 years after emerging from Chapter 11.

	Mean		Mean Diff	Median		Median Diff
	W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
Pre-Chapter 11						
All Firms	-1.815	-17.771	15.956	0.328	0.198	0.129
Manufacturing	0.788	0.249	0.539	0.973	1.173	-0.201
Non-Manufacturing	-3.406	-26.623	23.217	-0.129	-0.189	0.061
Post-Chapter11						
All Firms	2.521	-0.299	2.819	1.330	0.283	1.047***
Manufacturing	0.632	17.514	-16.882	1.997	1.626	0.371
Non-Manufacturing	3.675	-9.049	12.723	0.662	-0.402	1.064***

Table 1.19a: With- vs. Without-Projection: 5-Year Z-scores before Chapter 11

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	pre-5	1.115***	-1.105	2.220**	1.289***	1.272	0.018
	pre-4	0.934***	-1.364	2.297	1.232***	1.243*	-0.011
	pre-3	0.752***	-0.927	1.678	1.072***	0.755	0.317
	pre-2	0.008	-2.753***	2.761**	0.242	0.688	-0.446
	pre-1	-1.854***	-6.525***	4.671***	-1.147***	-2.143***	0.996**
Manufacturing	pre-5	1.932***	-0.871	2.803	1.943***	1.751	0.192
	pre-4	1.207**	-0.864	2.070	1.345***	1.452**	-0.107
	pre-3	1.018**	0.595	0.423	1.326***	1.270**	0.056
	pre-2	0.593	-0.145	0.737	0.904***	1.824*	-0.919
	pre-1	-0.397	-3.021**	2.624*	-0.016	0.183	-0.199
Non-Manufacturing	pre-5	0.656*	-1.214	1.870	0.950***	0.858	0.092
	pre-4	0.764***	-1.594	2.358	1.035***	1.023	0.013
	pre-3	0.585**	-1.587	2.172*	0.811**	0.411	0.400
	pre-2	-0.356	-3.917***	3.561**	0.079	0.173*	-0.094
	pre-1	-2.757***	-8.276***	5.520***	-2.798***	-3.912***	1.114*

Table 1.19b: With- vs. Without-Projection: 5-Year Z-scores after Chapter 11

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	post+1	1.341***	-3.107***	4.448***	1.238***	0.646	0.592**
	post+2	1.599***	-0.462	2.061**	1.447***	0.903	0.544**
	post+3	1.620***	-1.038	2.658***	1.482***	0.477	1.004**
	post+4	1.630***	-0.937	2.567**	1.474***	0.984	0.490
	post+5	1.564*	-2.457	4.021*	1.387*	1.069	0.317
Manufacturing	post+1	1.572***	-1.380	2.952	1.748***	1.389	0.359
	post+2	1.759***	1.728*	0.031	1.619***	1.896**	-0.277
	post+3	1.904***	0.496	1.408	1.996***	1.759	0.237
	post+4	1.802***	-0.494	2.296	2.011***	1.515	0.496
	post+5	2.812***	-4.358	7.171	2.814***	1.486	1.328
Non-Manufacturing	post+1	1.173***	-3.971***	5.144***	0.552***	0.038	0.514**
	post+2	1.496***	-1.649*	3.144***	0.853***	-0.201	1.054**
	post+3	1.442**	-2.007*	3.449***	0.806**	-0.156	0.962**
	post+4	1.504*	-1.218	2.722*	0.959	0.639	0.321
	post+5	0.976	-1.256	2.232	0.440	1.069	-0.630

Table 1.20a: Components of Z-score: Manufacturing Firms in With-Projection Group

All the numbers shown below are medians. Manufacturing firms have five components in their Z-score model. WC/TA is working capital divided by total assets, which is a liquidity measure. RE/TA is retained earnings divided by total assets, which is profitability measure. EBIT/TA is earnings before interest and taxes divided by total assets, which is a productivity measure. MktEquity/TL is market value of equity divided by total liabilities, which is a solvency measure. Sales/TA is sales divided by total assets, which is a turnover measure. We report the 'net" numbers for pre- and post- Chapter 11. In addition, we also report these 'net' numbers multiply their coefficients in the Z-score model. The coefficients are 1.2, 1.4, 3.3, 0.6 and 1 for the five components in the Z-score model for manufacturing firms.

		With-Projection						
		N	WC/TA	RE/TA	EBIT/TA	MktEquity/TL	Sales/TA	Z-score
Pre-Ch11	pre-5	27	0.161	-0.064	0.082	0.664	1.147	
	pre-4	31	0.166	-0.05	0.081	0.402	1.076	
	pre-3	32	0.142	-0.109	0.066	0.253	1.005	
	pre-2	33	0.116	-0.274	0.044	0.162	1.058	
	pre-1	33	-0.238	-0.383	0.017	0.047	1.089	
Pre-Ch11 w. coefficients	pre-5	27	0.194	-0.089	0.27	0.398	1.146	1.918
	pre-4	31	0.199	-0.07	0.269	0.241	1.075	1.714
	pre-3	32	0.171	-0.152	0.216	0.152	1.004	1.391
	pre-2	33	0.139	-0.384	0.144	0.097	1.057	1.054
	pre-1	33	-0.286	-0.536	0.057	0.028	1.088	0.351
Post-Ch11	post+1	33	0.161	-0.061	0.046	0.484	1.156	
	post+2	32	0.179	-0.07	0.059	0.393	1.185	
	post+3	27	0.212	-0.028	0.058	0.547	1.393	
	post+4	22	0.184	-0.122	0.091	0.661	1.293	
	post+5	19	0.138	-0.067	0.105	1.039	1.299	
Post-Ch11 w coefficient	post+1	33	0.193	-0.085	0.15	0.29	1.155	1.703
	post+2	32	0.215	-0.098	0.196	0.236	1.184	1.732
	post+3	27	0.254	-0.04	0.193	0.328	1.392	2.127
	post+4	22	0.221	-0.171	0.301	0.396	1.291	2.039
	post+5	19	0.165	-0.093	0.348	0.624	1.298	2.341

Table 1.20b Components of Z-score: Manufacturing Firms in Without-Projection Group

		Without-Projection						
		N	WC/TA	RE/TA	EBIT/TA	MktEquity/TL	Sales/TA	Z-score
Pre-Ch11	pre-5	20	0.196	-0.211	0.024	1.781	0.791	
	pre-4	23	0.24	-0.251	0.015	1.989	0.887	
	pre-3	23	0.246	-0.376	0.035	1.193	0.836	
	pre-2	25	0.146	-0.636	-0.093	0.788	0.75	
	pre-1	28	-0.037	-0.743	-0.07	0.228	0.782	
Pre-Ch11 w. coefficients	pre-5	20	0.235	-0.295	0.081	1.068	0.79	1.879
	pre-4	23	0.288	-0.351	0.049	1.193	0.886	2.065
	pre-3	23	0.295	-0.527	0.114	0.716	0.835	1.432
	pre-2	25	0.175	-0.891	-0.305	0.473	0.75	0.201
	pre-1	28	-0.044	-1.04	-0.229	0.137	0.781	-0.396
Post-Ch11	post+1	28	0.214	-0.31	0	0.642	1.004	
	post+2	27	0.322	-0.256	-0.024	1.679	1.1	
	post+3	26	0.25	-0.416	-0.03	1.669	1.057	
	post+4	24	0.164	-0.377	0.015	1.307	1.089	
	post+5	19	0.25	-1.309	-0.072	1.893	0.927	
Post-Ch11 w coefficient	post+1	28	0.257	-0.433	0	0.385	1.003	1.211
	post+2	27	0.386	-0.359	-0.078	1.007	1.099	2.055
	post+3	26	0.3	-0.583	-0.1	1.002	1.056	1.675
	post+4	24	0.196	-0.528	0.05	0.784	1.088	1.591
	post+5	19	0.3	-1.833	-0.238	1.136	0.926	0.291

Table 1.21a Components of Z-score: Non-Manufacturing Firms in With-Projection Group

All the numbers shown below are medians. Non-manufacturing firms have four components in their Z-score model, WC/TA is working capital divided by total assets, which is a liquidity measure. RE/TA is retained earnings divided by total assets, which is profitability measure. EBIT/TA is earnings before interest and taxes divided by total assets, which is a productivity measure. BookEquity/TL is book value of equity divided by total liabilities, which is a solvency measure. We report the 'net" numbers for pre- and post- Chapter 11. In addition, we also report these 'net' numbers multiply their coefficients in the Z-score model. The coefficients are 6.56, 3.26, 6.72, and 1.05 for the four components in the Z-score model for non-manufacturing firms.

		With-Projection					
		N	WC/TA	RE/TA	EBIT/TA	BookEquity/TL	Z-score
Pre-Ch11	pre-5	48	0.018	-0.007	0.041	0.297	
	pre-4	50	0.059	-0.059	0.052	0.301	
	pre-3	51	0.051	-0.098	0.030	0.307	
	pre-2	53	0.020	-0.160	-0.010	0.208	
	pre-1	54	-0.053	-0.331	-0.031	0.041	
Pre-Ch11 w.coefficient	pre-5	48	0.120	-0.023	0.276	0.312	0.685
	pre-4	50	0.384	-0.192	0.352	0.316	0.860
	pre-3	51	0.334	-0.320	0.203	0.323	0.539
	pre-2	53	0.132	-0.520	-0.066	0.218	-0.236
	pre-1	54	-0.349	-1.080	-0.211	0.043	-1.596
Post-Ch11	post+1	54	0.046	-0.027	0.028	0.534	
	post+2	44	0.084	-0.027	0.028	0.668	
	post+3	42	0.061	-0.081	0.008	0.477	
	post+4	35	0.069	-0.211	0.007	0.552	
	post+5	26	0.088	-0.367	0.002	0.52	
Post-Ch11 w coefficient	post+1	54	0.300	-0.087	0.186	0.561	0.960
	post+2	44	0.553	-0.089	0.190	0.701	1.355
	post+3	42	0.403	-0.264	0.053	0.501	0.694
	post+4	35	0.454	-0.688	0.049	0.580	0.394
	post+5	26	0.574	-1.195	0.011	0.546	-0.064

Table 1.21b Components of Z-score: Non-Manufacturing Firms in Without-Projection Group

		Without-Projection					
		N	WC/TA	RE/TA	EBIT/TA	BookEquity/TL	Z-score
Pre-Ch11	pre-5	43	0.069	-0.056	0.000	0.353	
	pre-4	50	0.058	-0.046	0.005	0.282	
	pre-3	53	0.110	-0.116	-0.018	0.337	
	pre-2	56	0.059	-0.181	-0.013	0.260	
	pre-1	57	-0.223	-0.559	-0.071	0.013	
Pre-Ch11 w.coefficient	pre-5	43	0.455	-0.183	0.003	0.370	0.645
	pre-4	50	0.380	-0.150	0.032	0.296	0.559
	pre-3	53	0.722	-0.378	-0.119	0.354	0.579
	pre-2	56	0.389	-0.590	-0.088	0.273	-0.017
	pre-1	57	-1.46	-1.821	-0.478	0.013	-3.746
Post-Ch11	post+1	57	0.056	-0.206	-0.012	0.264	
	post+2	54	0.029	-0.192	0.012	0.310	
	post+3	48	0.024	-0.207	0.029	0.307	
	post+4	38	0.028	-0.118	0.046	0.393	
	post+5	30	0.030	-0.155	0.044	0.397	
Post-Ch11 w coefficient	post+1	57	0.366	-0.671	-0.082	0.277	-0.11
	post+2	54	0.188	-0.625	0.080	0.326	-0.031
	post+3	48	0.158	-0.674	0.192	0.323	-0.002
	post+4	38	0.182	-0.383	0.312	0.413	0.523
	post+5	30	0.194	-0.505	0.293	0.417	0.399

Table 1.22 With- vs. Without-Projection: Duration

	Mean	Median	Maximum	Minimum
	With-Projection			
All firms	404	211	2235	29
Manufacturing	566	264	2235	37
Non-Manufacturing	308	195	1244	29
	Without-Projection			
All firms	409	390	1102	35
Manufacturing	453	405	1089	64
Non-Manufacturing	388	390	1102	35

Table 1.23a Post-Chapter 11 Excess Stock Return: Short vs. Long Duration for With-Projection Group

Excess return is the difference between the stock return of each firm in each year and the S&P 500 return in the same year. Post+1, post+2, post+3, post+4, and post+5 are 1 year, 2 years, 3 years, 4 years and 5 years after emerging from Chapter 11.

		Mean		Mean Diff	Median		Median Diff
		Short	Long	Short - Long	Short	Long	Short - Long
All Firms		8.6%	3.4%	5.2%	-5.9%	0.6%	-6.6%
	post+1	24.2%	49.2%***	-24.9%	15.5%	18.7%**	-3.2%
	post+2	0.3%	-8.2%	8.5%	2.1%	-8.1%	10.2%
	post+3	-3.8%	4.0%	-7.8%	-11.2%	-2.7%	-8.5%
	post+4	7.1%	-4.0%	11.1%	-21.9%	-19.8%	-2.0%
	post+5	3.7%	-7.1%	10.9%	-9.0%	-8.9%	0.0%
Manufacturing		19.4%*	-3.2%	22.6%	22.2%*	-7.7%	29.9%
	post+1	31.4%	31.9%	-0.5%	22.4%	-6.2%	28.6%
	post+2	16.0%	-15.2%	31.2%	40.4%	-26.9%	67.2%
	post+3	37.8%	-16.4%	54.1%*	6.6%	-17.6%	24.2%
	post+4	19.5%	12.7%	6.8%	-17.9%	-6.6%	-11.3%
	post+5	4.2%	1.2%	3.0%	-10.3%	-5.1%	-5.2%
Non-Manufacturing		6.8%	3.6%	3.2%	-6.2%	-1.1%	-5.1%
	post+1	31.7%	50.9%**	-19.2%	15.5%	18.7%*	-3.2%
	post+2	-8.5%	-3.2%	-5.3%	-13.7%	-4.4%	-9.3%
	post+3	-15.8%	5.6%	-21.4%	-26.4%*	-6.2%	-20.2%*
	post+4	-1.1%	-13.9%	12.8%	-25.2%	-27.4%*	2.2%
	post+5	3.8%	-14.2%	18.0%	-8.3%	-13.7%	5.4%

Table 1.23b Post-Chapter 11 Excess Stock Return: Short vs. Long Duration for Without-Projection Group

		Mean		Mean Diff	Median		Median Diff
		Short	Long	Short - Long	Short	Long	Short - Long
All Firms		-0.1%	7.6%	-7.7%	-9.0%	11.2%	-20.2%
	post+1	-2.2%	-2.3%	0.1%	-37.1%	-23.9%	-13.2%
	post+2	15.5%	-18.4%	33.9%	8.2%	-31.8%**	40.0%
	post+3	21.2%	24.4%	-3.2%	15.9%	-8.4%	24.3%
	post+4	-3.9%	-4.7%	0.8%	-10.8%	-15.4%	4.6%
	post+5	-19.8%	32.5%**	-52.3%**	-26.9%*	28.2%*	-55.1%**
Manufacturing		-16.9%	5.6%	-22.5%	-21.3%	11.3%	-32.6%
	post+1	30.8%	-16.2%	47.1%	30.8%	-32.6%	63.4%
	post+2	28.8%	-16.2%	45.1%	19.5%	-25.1%	44.7%
	post+3	4.5%	18.0%	-13.5%	4.5%	- 6.8%	11.3%
	post+4	-3.2%	-14.6%	11.5%	-4.3%	-11.8%	7.5%
	post+5	-34.3%*	48.0%	-82.2%	-25.4%	8.5%	-33.8%
Non-Manufacturing		5.5%	8.4%	-2.9%	-3.2%	11.2%	-14.5%
	post+1	-8.2%	4.2%	-12.3%	-37.1%	-23.9%	-13.2%
	post+2	12.4%	-19.3%	31.7%	1.5%	-32.1%*	33.6%
	post+3	23.7%	27.0%	-3.2%	15.9%*	-8.4%	24.3%
	post+4	-4.1%	-0.5%	-3.6%	-23.3%	-15.4%	-7.9%
	post+5	-15.9%	25.9%	-41.7%	-28.5%	32.1%	-60.6%

Table 1.24 Leverage: Pre- vs. Post- Chapter 11

We define leverage as total liabilities divided by total assets. Diff = post – pre

	Pre Mean	Post Mean	Diff	Pre Median	Post Median	Diff
	With-Projection					
All Firms	0.895	0.784	-0.112	0.846	0.727	-0.118***
Manufacturing Firms	1.010	0.978	-0.032	0.973	0.821	-0.152*
Non-Manufacturing Firms	0.825	0.665	-0.161	0.803	0.684	-0.119***
	Without-Projection					
All Firms	1.416	0.996	-0.421	0.840	0.743	-0.098**
Manufacturing Firms	0.883	0.781	-0.102	0.688	0.644	-0.044
Non-Manufacturing Firms	1.678	1.101	-0.577	0.868	0.758	-0.110**

Table 1.25 Leverage: With- vs. Without-Projection

Diff = with-projection – without-projection

	W Proj	W/O Proj	Diff	W Proj	W/O Proj	Diff
	Pre Mean			Pre Median		
All Firms	0.895	1.416	-0.521	0.727	0.84	-0.113
Manufacturing Firms	1.01	0.883	0.127	0.821	0.688	0.133**
Non-Manufacturing Firms	0.825	1.678	-0.853	0.684	0.868	-0.184
	Post Mean			Post Median		
All Firms	0.784	0.996	-0.212	0.846	0.743	0.103
Manufacturing Firms	0.978	0.781	0.197	0.973	0.644	0.329*
Non-Manufacturing Firms	0.665	1.101	-0.436	0.803	0.758	0.045*

Table 1.26a 5-Year Pre-Chapter 11 Leverage: With- vs. Without-Projection

		Mean			Median		
		W Proj	W/O Proj	Diff	W Proj	W/O Proj	Diff
All Firms	pre-5	0.779	0.764	0.015	0.771	0.662	0.110
	pre-4	0.838	0.880	-0.042	0.821	0.778	0.044
	pre-3	0.835	1.172	-0.337	0.784	0.725	0.058*
	pre-2	0.935	1.834	-0.900	0.859	0.782	0.077**
	pre-1	1.040	1.694	-0.654	1.028	0.966	0.062
Manufacturing Firms	pre-5	0.824	0.768	0.055	0.844	0.619	0.225
	pre-4	0.903	0.908	-0.005	0.945	0.732	0.213**
	pre-3	0.919	0.757	0.162	0.916	0.694	0.222***
	pre-2	1.063	0.881	0.182	0.965	0.743	0.221**
	pre-1	1.279	1.096	0.184	1.122	0.871	0.252**
Non-Manufacturing Firms	pre-5	0.754	0.762	-0.008	0.745	0.739	0.005
	pre-4	0.798	0.866	-0.069	0.763	0.780	-0.017
	pre-3	0.783	1.352	-0.570	0.751	0.738	0.013
	pre-2	0.855	2.260	-1.405	0.805	0.794	0.011
	pre-1	0.892	1.993	-1.102	0.944	0.986	-0.042

Table 1.26b 5-Year Post-Chapter 11 Leverage: With- vs. Without-Projection

		Mean			Median		
		W Proj	W/O Proj	Diff	W Proj	W/O Proj	Diff
All Firms	post+1	0.768	1.039	-0.272	0.690	0.742	-0.052
	post+2	0.724	0.735	-0.011	0.690	0.702	-0.012
	post+3	0.756	0.771	-0.015	0.694	0.709	-0.015
	post+4	0.819	0.797	0.022	0.717	0.722	-0.004
	post+5	0.727	0.850	-0.123	0.737	0.716	0.021
Manufacturing Firms	post+1	0.922	0.826	0.096	0.776	0.580	0.197
	post+2	0.886	0.657	0.229	0.806	0.645	0.161*
	post+3	0.932	0.666	0.266	0.753	0.632	0.120
	post+4	1.072	0.905	0.167	0.763	0.722	0.041
	post+5	0.895	1.022	-0.127	0.761	0.702	0.060
Non-Manufacturing Firms	post+1	0.655	1.146	-0.491*	0.651	0.792	-0.140**
	post+2	0.620	0.777	-0.158**	0.600	0.763	-0.164*
	post+3	0.645	0.836	-0.192**	0.677	0.765	-0.088
	post+4	0.635	0.729	-0.094	0.639	0.718	-0.079
	post+5	0.648	0.742	-0.094	0.658	0.716	-0.058

Table 1.27 Excess Return: Pre- vs. Post-Chapter 11

The excess return is defined as the difference between the company stock return and the market return. We use S&P500 return as our market return index. All the returns before the filing dates of Chapter 11 are the returns in pre-Chapter 11 period, and all the returns after the effective dates in Chapter 11 are the post-Chapter 11 returns.

	Mean		Mean Diff	Median		Median Diff
	Pre	Post	Post - Pre	Pre	Post	Post - Pre
			With-Projection			
All Firms	-20.9%***	6.00%	26.9%***	-26.9%***	-3.30%	23.5%***
Manufacturing	-29.1%***	7.60%	36.7%***	-27.2%***	17.40%	44.6%***
Non-Manufacturing	-16.5%***	5.20%	21.7%***	-20.6%***	-6.00%	14.5%***
			Without-Projection			
All Firms	-33.2%***	3.80%	37.0%***	-30.6%***	8.40%	39.0%***
Manufacturing	-34.8%***	-4.60%	30.2%*	-29.1%***	8.40%	37.50%	
Non-Manufacturing	-32.7%***	7.00%	39.7%***	-30.6%***	5.10%	35.6%***

Table 1.28 Excess Return: With- vs. Without-Projection

	W Proj	W/O Proj	Diff	W Proj	W/O Proj	Diff
	Pre Mean			Pre Median		
All Firms	-20.9%***	-33.2%***	12.2%**	-26.9%***	-30.60%	3.70%
Manufacturing	-29.1%***	-34.8%***	5.70%	-27.2%***	-29.10%	1.90%
Non-Manufacturing	-16.5%***	-32.7%***	16.2%**	-20.6%***	-30.60%	10.00%
	Post Mean			Post median		
All Firms	6.00%	3.80%	2.10%	-3.30%	8.40%	-11.80%
Manufacturing	7.60%	-4.60%	12.20%	17.40%	8.40%	9.00%
Non-Manufacturing	5.20%	7.00%	-1.80%	-6.00%	5.10%	-11.10%

Table 1.29a 5-Year Pre-Chapter 11Excess Return: With- vs. Without-Projection

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	pre-5	-4.0%	-5.1%	1.2%	-19.9%*	-2.0%	-17.9%
	pre-4	-4.7%	-13.1%	8.4%	-23.6%**	-18.8%*	-4.8%
	pre-3	-7.5%	-25.5%***	18.1%	-30.8%**	-36.2%***	5.3%
	pre-2	-42.9%***	-63.5%***	20.5%**	-53.1%***	-71.2%***	18.0%***
	pre-1	-61.4%***	-54.7%***	-6.7%	-77.9%***	-74.5%***	-3.4%
Manufacturing	pre-5	-7.9%	8.2%	-16.2%	-20.3%	14.4%	-34.7%
	pre-4	-17.7%	-15.9%	-1.9%	-27.5%**	4.2%	-31.7%
	pre-3	-21.7%*	-54.6%***	33.0%	-26.2%***	-54.7%**	28.5%*
	pre-2	-41.4%***	-67.5%***	26.1%	-48.5%***	-68.9%**	20.4%*
	pre-1	-76.2%***	-60.2%**	-16.0%	-78.3%***	-77.1%**	-1.2%
Non-Manufacturing	pre-5	-1.5%	-8.4%	6.9%	-19.1%	-6.4%	-12.7%
	pre-4	2.8%	-12.3%	15.2%	-22.8%	-19.0%	-3.8%
	pre-3	0.1%	-18.0%*	18.1%	-32.5%	-27.2%*	-5.4%
	pre-2	-43.7%***	-62.5%***	18.8%	-56.7%***	-71.4%***	14.7%*
	pre-1	-53.8%***	-53.3%***	-0.4%	-76.6%***	-70.7%***	-5.9%

Table 1.29b 5-Year Post-Chapter 11Excess Return: With- vs. Without-Projection

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	post+1	38.1%***	-2.2%	40.3%**	18.7%**	-29.1%	47.9%**
	post+2	-4.3%	-3.8%	-0.6%	-5.3%	-26.7%	21.4%
	post+3	0.4%	23.1%	-22.6%	-7.5%	10.8%	-18.3%
	post+4	1.4%	-4.4%	5.8%	-20.8%	-10.8%	-9.9%
	post+5	-2.1%	15.8%	-18.0%	-9.0%	7.1%	-16.1%
Manufacturing	post+1	31.7%	-4.5%	36.2%	12.6%	-32.6%	45.2%
	post+2	-1.3%	-1.2%	-0.1%	-0.2%	-18.4%	18.2%
	post+3	9.3%	14.7%	-5.4%	3.9%	-6.8%	10.7%
	post+4	16.1%	-10.8%	26.9%	-16.8%	-4.3%	-12.5%
	post+5	2.6%	27.4%	-24.8%	-6.8%	5.2%	-12.0%
Non-Manufacturing	post+1	41.6%**	-1.5%	43.1%*	18.7%**	-29.1%	47.9%**
	post+2	-5.8%	-4.6%	-1.2%	-5.3%	-28.0%	22.7%
	post+3	-4.5%	25.5%	-30.0%	-14.8%	13.4%	-28.1%
	post+4	-7.7%	-2.1%	-5.6%	-26.7%*	-16.0%	-10.6%
	post+5	-5.6%	11.5%	-17.1%	-9.0%	15.6%	-24.6%

Table 1.30: Sharpe Ratio: Pre- vs. Post-Chapter 11

	Mean		Mean Diff	Median		Median Diff
	Pre	Post	Post - Pre	Pre	Post	Post - Pre
			With-Projection			
All Firms	0.251	0.778	0.527	-0.967***	0.282	1.249**
Manufacturing	-1.161***	0.478	1.639	-1.201***	1.585	2.787**
Non-Manufacturing	1.018	0.931	-0.087	-0.807	0.006	0.813
			Without-Projection			
All Firms	4.099	1.700***	-2.399	-0.883	1.487***	2.369*
Manufacturing	5.161	1.109	-4.052	0.450	0.541	0.091
Non-Manufacturing	3.806	1.917***	-1.889	-1.021	1.509**	2.530**

Table 1.31a 5-Year Pre-Chapter 11 Sharpe Ratio: With- vs. Without-Projection

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	pre-5	1.121	7.760*	-6.639**	-0.587	1.280	-1.867
	pre-4	3.709	1.148	2.561	-0.959	-0.609	-0.350
	pre-3	-0.033	-0.875	0.841	-1.507	-2.229**	0.722
	pre-2	-2.349	-3.138***	0.789*	-2.432	-3.257***	0.825*
	pre-1	-2.866	8.441	-11.307	-2.964	-2.337***	-0.627
Manufacturing	pre-5	0.812	24.622	-23.809**	0.105	1.918	-1.813
	pre-4	-0.689	4.973*	-5.663***	-1.412	2.865**	-4.277**
	pre-3	-0.974	-2.743***	1.769*	-1.448	-2.712**	1.264*
	pre-2	-2.331	-3.643***	1.312	-2.399	-4.309**	1.910
	pre-1	-4.261	-2.482**	-1.778	-3.724	-2.875**	-0.850
Non-Manufacturing	pre-5	1.317	3.659*	-2.342	-0.678	0.670	-1.348
	pre-4	6.391	0.032	6.358	-0.295	-0.822	0.527
	pre-3	0.469	-0.390	0.859	-1.507	-1.450	-0.057
	pre-2	-2.358	-3.012***	0.654	-2.565	-3.154***	0.588
	pre-1	-2.168	11.172	-13.341	-2.483	-2.173***	-0.310

Table 1.31b 5-Year Post-Chapter 11 Sharpe Ratio: With- vs. Without-Projection

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	post+1	4.957***	2.085	2.872	1.799***	-1.159	2.958*
	post+2	0.873	0.519	0.354	0.061	-1.005	1.066
	post+3	1.576	3.464***	-1.888	-0.850	0.512**	-1.362*
	post+4	-0.431	1.479	-1.910	-1.335	-0.999	-0.335
	post+5	-0.904*	1.836**	-2.740***	-1.602**	0.999	-2.602
Manufacturing	post+1	5.342*	4.904	0.438	2.055	-1.019	3.074
	post+2	1.063	0.257	0.806	0.376	-1.256	1.632
	post+3	1.315	1.965	-0.650	0.660	-0.132	0.791
	post+4	-0.133	0.681	-0.814	-0.461	0.314	-0.775
	post+5	-0.126	1.820	-1.946	-1.542	0.506	-2.048
Non-Manufacturing	post+1	4.764**	1.145	3.620	1.799**	-1.212	3.011*
	post+2	0.780	0.768	0.012	0.061	-1.002	1.063
	post+3	1.722	3.908***	-2.186	-1.271	1.616**	-2.887**
	post+4	-0.616	1.766	-2.383	-2.886	-1.146	-1.740
	post+5	-1.487**	1.843*	-3.330***	-1.855**	1.006	-2.860***

Table 1.32 Treynor Ratio: Pre- vs. Post-Chapter 11

	Mean		Mean Diff	Median		Median Diff
	Pre	Post	Post - Pre	Pre	Post	Post - Pre
	With-Projection					
All Firms	-0.450*	0.171	0.621**	-0.137***	-0.090	0.046
Manufacturing	-0.450	0.176	0.626	-0.133**	-0.035	0.098
Non-Manufacturing	-0.450	0.168	0.618	-0.137*	-0.188	-0.052
	Without-Projection					
All Firms	0.964	-0.14	-1.104	-0.205**	0.017	0.222*
Manufacturing	-0.421***	-0.694	-0.274	-0.403**	-0.134	0.269
Non-Manufacturing	1.386	0.061	-1.324	-0.146	0.124	0.270

Table 1.33a 5-Year Pre-Chapter 11 Treynor Ratio: With- vs. Without-Projection

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	pre-5	0.245	0.075	0.170	-0.066	0.064	-0.130
	pre-4	0.011	-0.016	0.027	-0.175	-0.038	-0.137
	pre-3	0.122	0.726	-0.604	-0.249	-0.083	-0.166
	pre-2	-0.168	0.438	-0.605	-0.246**	-0.244*	-0.001
	pre-1	-2.756**	0.017	-2.773**	-0.507***	-0.458	-0.049
Manufacturing Firms	pre-5	0.215	0.019	0.196	-0.055	0.064	-0.119
	pre-4	0.185	-0.346	0.531	0.025	-0.213	0.238
	pre-3	0.048	0.061	-0.013	-0.215**	-0.132	-0.083
	pre-2	-0.468	-0.512**	0.045	-0.260*	-0.562	0.301
	pre-1	-2.531	-0.669***	-1.862	-0.597***	-0.690**	0.093
Non-Manufacturing Firms	pre-5	0.268	0.089	0.179	-0.091	-0.017	-0.074
	pre-4	-0.127	0.060	-0.187	-0.209	-0.037	-0.172
	pre-3	0.181	0.782	-0.601	-0.250	-0.034	-0.216
	pre-2	0.025	0.688	-0.662	-0.246*	-0.236	-0.010
	pre-1	-2.908*	0.172	-3.080*	-0.394***	-0.300	-0.094

Table 1.33b 5-Year Post-Chapter 11 Treynor Ratio: With- vs. Without-Projection

		Mean		Mean Diff	Median		Median Diff
		W Proj	W/O Proj	W Proj - W/O Proj	W Proj	W/O Proj	W Proj - W/O Proj
All Firms	post+1	1.822	-0.452**	2.274	-0.025	-0.220**	0.195*
	post+2	0.232*	-0.364	0.597	0.231**	-0.057	0.288
	post+3	0.949	-1.202	2.152	-0.082	-0.016	-0.066
	post+4	-0.366*	0.069	-0.436	-0.191**	0.052	-0.242
	post+5	0.000	0.881	-0.881	-0.158	0.054	-0.212
Manufacturing Firms	post+1	3.666	-1.135	4.801	0.868	-1.135	2.003
	post+2	0.124	-0.888	1.012	0.193	-0.888	1.081
	post+3	0.106	-7.234	7.340	-0.070	0.023	-0.093
	post+4	-0.119	0.064	-0.182	-0.066	0.041	-0.107
	post+5	0.016	1.956	-1.940	-0.168	-0.066	-0.102
Non-Manufacturing Firms	post+1	0.438	-0.316	0.754	-0.102	-0.101	0.000
	post+2	0.412	-0.269	0.681*	0.335	-0.057	0.391
	post+3	1.722	0.808	0.914	-0.253	-0.056	-0.197
	post+4	-0.579*	0.072	-0.651	-0.314***	0.117	-0.431**
	post+5	-0.011	0.478	-0.489	-0.150	0.083	-0.233

Table 1.34 Regression of Post-Chapter 11 Excess Returns: All Years

Excess Returns = $\alpha + \beta_1$*Firm Characteristic + β_2*Chapter 11 Characteristic + β_3*Duration
Firm characteristic = 1 if it is a manufacturing firms
Firm characteristic = 0 if it is a nonmanufacturing firms
Chapter-11 characteristic = 1 if the firm has a projection plan
Chapter-11 characteristic = 0 if the firm doesn't
Duration = Log(number of days in Chapter 11)

	Parameter	t-value
Firm Characteristics	0.073	0.41
Chapter 11 Characteristics	0.060	0.36
Duration	0.068	0.77

Table 1.35 Regression of Post-Chapter 11 Excess Returns: First Year after Emergence

	Parameter	t-value
Firm Characteristics	0.526	0.70
Chapter 11 Characteristics	1.111	1.59
Duration	0.362	1.02

Table 1.36 Estimation of β

The first line is the average of the betas. The second line is the t-values.

	With-Projection		Without-Projection	
	Pre-Ch11	Post-Ch11	Pre-Ch11	Post-Ch11
All firms	1.37***	1.27***	1.36***	1.04***
	25.14	15.93	18.17	13.18
Manufacturing firms	1.29***	1.22***	1.43***	1.39***
	16.56	9.68	10.12	8.30
Nonmanufacturing firms	1.41***	1.30***	1.34***	0.91***
	19.15	12.56	15.24	10.32

CHAPTER 2

INVESTING IN BANKRUPT STOCKS: IS IT A SWEET TRICK?

2.1 Introduction

Bankruptcy filing is a significant economic event in a corporation's life cycle. Prior research documents negative market reactions to bankruptcy filing announcements (Clark and Weistein (1983), Datta and Iskandar-Datta (1995), Dawkins and Rose-Green (1998), and Coelho and Taffler (working paper, 2008)). The securities of a publicly owned firm that files for Chapter 11 often continue to trade. If such a firm's securities are delisted by the NYSE, Nasdaq or AMEX, their trading may move to the Pink Sheets.

One of the most noticeable characteristics of the stocks of bankrupt firms is how much their price has fallen from prior levels. These very low prices often draw attention from unsophisticated investors who rush in to buy these stocks. Such investors may expect, or at least hope, for a huge profit when the company reorganizes and emerges from Chapter 11. They may believe that even if they don't make a killing, any loss will be limited due to the already depressed current level of the stock price. Such investors may not contemplate the likelihood that the stock will become worthless. A stock that falls from pennies a share to zero is still a 100% loss, a not uncommon result.

Herein we explore both the performance and the major factors which help explain the performance of these bankrupt stocks. The holding period return performance is measured in three ways: 1. The simple holding period return which only uses the price information: 2. The comprehensive holding period return which takes account of both price and final distributions specified in the reorganization or liquidation plan, and; 3. Alpha estimated from Carhart four-factor model (Carhart,1997).

We find that a strategy of buying such stocks on their bankruptcy filing day and holding until the final resolution date has produced significant negative returns for all three measures. The stock price alone may provide an illusion of limited loss exposure. The final distribution, however, reveals that investors will generally suffer severe losses. Over half of our sample, for which the plan of reorganization can be identified, cancel or extinguish their pre filing shares. As a result the common stock holders receive nothing and their stocks become worthless on the final resolution date.

In our multivariate regression analysis, we test three accounting variables, liquidity, profitability, and leverage, plus one dummy representing whether a firm suffers from financial distress pre bankruptcy, and one proxy for information uncertainty. The uncertainties of the Chapter 11 process add significant risk to investing in bankrupt stocks. We find liquidity to be the key factor in explaining stock returns. Profitability and information uncertainty are significant in explaining the positive returns, while liquidity and (un)profitability are the two major concerns for negative returns. Another interesting factor, the involvement of hedge funds, also draws our attention as hedge fund managers are experienced investors. They may have been able to select stocks with more attractive potentials. Our results, however, do not support this hypothesis.

Our paper contributes to the relevant literature in several ways. First, we extend the existing literature which document the large loss around the bankruptcy filing period (Clark and Weinstein (1983), Datta and Iskandar-Datta (1995), etc) and poor long-term after bankruptcy performance (Hotchkiss (1995), Coelho and Taffler (working paper, 2008), etc) by investigating the period during Chapter 11. This period draws our interests

as investors are lured into the market by noticing a record low stock price upon bankruptcy filing, but is the deal really as sweet as it looks?

Second, differing from Li and Zhong (working paper, 2009) and Coelho and Taffler (working paper, 2008) which also focus on stock performance during Chapter 11 is the comprehensive way we look at the holding period return. Investing in bankrupt stocks is not purely a financial activity, as it involves the uncertainty of the Chapter 11 legal process. The returns are also determined by the distributions listed in the reorganization plans, which are largely out of most investors' control. Therefore, the simple holding period return which only uses stock price is a biased measure of the return over the full Chapter 11 period. Combining the final distribution to the investors with the stock price information provides a more accurate understanding of the return scheme for bankrupt stock.

Third, our regression analysis uses lagged information in the year before bankruptcy filing, in order to test whether investors can rely on this available information when they invest in the bankrupt stocks. In addition to some traditional accounting variables, such as liquidity, profitability and leverage, we also explore whether a company files for bankruptcy due to financial distress or other strategic purposes, and the volatility inherent in the stock. More interestingly, we add a dummy variable for hedge fund participation, as hedge funds are run by veteran investment managers and may offer higher returns. We are interested in finding out whether the involvement of hedge fund in a bankrupt situation results in stronger performance for that firm.

The remainder of the paper is organized as follows: Section 2 provides a brief literature review. Section 3 discusses the data and methodology. Section 4 shows

descriptive statistics of our sample. We analyze our major results in Section 6, and we conclude the entire paper in Section 6.

2.2 Literature Review

The effect of a Chapter 11 filing on distressed companies' stocks has been well explored. Clark and Weinstein (1983) find large losses occur during the bankruptcy filing month. Those losses are especially concentrated in the three trading day interval surrounding the filing. Datta and Iskandar-Datta (1995), who explore the impact of a bankruptcy announcement on stock and debt holders, find a significant negative stock price reaction to the announcement. Dawkins and Rose-Green (1998) investigate the relationship between any prior WSJ discussions of possible bankruptcy filings and the price reaction to an actual filing. They also find significant negative abnormal returns around the bankruptcy filing date. The price reaction to bankruptcy filings is smaller for firms having prior WSJ stories of potential bankruptcy filings. Rose-Green and Dawkins (2002) explore the tendency of the stock market to differentiate between strategic bankruptcies and financial bankruptcies. Financial bankruptcy is characterized by short- or medium-term financial distress, such as default on interest or principal payment. Strategic bankruptcy is characterized by filing for Chapter 11 against one identifiable stakeholder (such as unionized employees), aiming to benefit the firm at the expense of the interest of that specific stakeholder. They find significantly less negative abnormal returns for strategic bankruptcies around the filing dates. Dawkins, Bhattacharya, and Bamber (2007) find, on average, the more negative the filing period price reaction, the

more favorable the immediate post-filing returns. Coelho and Taffler (working paper, 2008) also document negative abnormal and raw returns at the Chapter 11 filing date.

Related to our paper, many studies discuss the long-term performance of the stock of bankrupt firms after they emerge from Chapter 11, although the results are mixed. Morse and Shaw (1988) find that while trading in bankrupt stocks has become much more common, three year average returns for firms emerging from bankruptcy are positive and large but not significantly so, implying that no abnormal return is likely to be available. Hotchkiss (1995), who studies the operating performance of bankrupt firms after they emerge from Chapter 11, finds that over 40% of the firms continue to suffer operating losses in the first three years after emergence. Covering a more recent time period, Hotchkiss and Mooradian (2004) find that more than two thirds of their sample underperform industry peers for up to five years after emergence. Coelho and Taffler (working paper, 2008), who explore the long-term reaction to Chapter 11 filings, find strong negative and statistically significant post-Chapter 11 abnormal returns of at least -28% over the 12-month period after the Chapter 11 announcement. On the other hand, Eberhart, Altman, and Aggarwal (1999), who examine the equity performance of firms going through Chapter 11, document large positive excess returns over the 200 trading days following emergence. Kalay, Singhal, and Tashjian (2007) find that their sample experiences significant improvement in operating performances during Chapter 11. While Alderson and Betker (1999) report that the five year average annualized post emergence return of reorganized firms neither under- nor out-perform the S&P 500.

The characteristics and factors that impact the distressed bond/stock returns of bankrupt firms have been extensively studied. Morse and Shaw (1988) show that filing

for bankruptcy generally does not change systematic risk significantly but does significantly increase return variance. Datta and Iskamdar-Datta (1995) investigate both bond and stock returns. They find that three different classes of debt holders react differently to the information revealed by the bankruptcy filing. The secured debt holders are unaffected by the announcement. The unsecured and the convertible debt classes, in contrast, show significant adverse price reaction to the announcement. In addition, in the 21-day event period, the secured debt holders gain significantly while all other classes suffer substantial losses. Duration and complexity of the reorganization process both have a negative impact on the excess returns of bonds. Leverage is positively related to securities' excess returns. Griffin and Lemmon (2002) examine the relationship between book-to-market equity, distress risk, and stock returns. In the most distressed group, the return difference between high and low book-to-market is more than twice as great as that of the other groups. Campbell, Hilscher, and Szilagyi (2008) explore the determinants of the pricing of financially distressed stocks. They find such stocks have delivered anomalously low returns since 1981. Those stocks have lower returns but much higher standard deviations, market betas, loadings on value and small-cap risk factors than do stocks with a low risk of failure.

2.3 Hypothesis, Data and Methodology

2.3.1 Hypothesis

While the negative performance of bankrupt stocks is well documented, most of them are calculated based on stock performance only. However, the entire Chapter 11 process is full of rich content, such as plan of reorganization, disclosure statement, and

etc. The information generated during the Chapter 11 process should not be neglected. Therefore, we should take the above information into consideration also. If we combine the stock price and the reorganization treatment information to the common stock class, we should be able to see the entire story of the performance of bankrupt stocks. In addition, the largely negative stock performance is an overall performance. It does not indicate that making a profit by investing in the bankrupt stock is totally impossible. Therefore, we test the following two hypotheses in this paper:

Hypothesis 1: Investing in bankrupt stocks would generate a larger loss considering both stock price and the final distributions to old common stock holders, compared to the existing literature which largely uses stock prices only to compute returns.

Hypothesis 2: Stocks with profit potential behave differently compared to the ones without such potential.

2.3.2 Data

Our sample collection process is outlined in Table 2.1. We obtain our initial list of 2776 bankruptcy filings from 1978 to 2008 from the bankruptcydata.com database. First, we checked their records on the Center of Research in Security Prices (CRSP) database. The 1007 cases that were not found in CRSP were eliminated. Second, we checked how many of the remaining firms have trading information during their Chapter 11 process thereby eliminating 1209 firms that were delisted prior to or upon their bankruptcy filing. Of the remaining 560 firms, 80 additional cases were removed because their data were unavailable or they were still in Chapter 11 in 2010. Nineteen firms were also excluded as they have missing trading information during the bankruptcy period, and 7 more firms

were removed as their first available trading date is longer than 5 days after the Chapter 11 filing. Following Fama and French (2001), we exclude 55 financial (SIC code 6000-6999) and utility firms (SIC code 4900-4999), as the financial decisions of utility firms are affected by regulation and the financial ratios of financial firms are not comparable to those of other industrial firms. Accounting information from Compustat is also required, thereby eliminating another 104 firms. Our final sample consisted of 295 firms.

2.3.3 Return to existing common stock holders

We assume that the investor buys the stocks as soon as a trouble company files Chapter 11, probably expecting that it can successfully reorganize and resume trading on major stock exchanges. Such investors are assumed simply to buy the bankrupt stocks and hold them until the resolution date of Chapter 11 case.

We consider three measures for the returns to existing common stock holder starting with the simple holding period return (S-HPR), which only uses the trading information (stock prices) available from CRSP:

$$\text{S-HPR} = \text{Price}_{\text{Last}} / \text{Price}_{\text{First}} - 1 \qquad (1)$$

in which $\text{Price}_{\text{Last}}$ is the last available stock price, and $\text{Price}_{\text{First}}$ is the stock price on the bankruptcy filing date. S-HPR is the most straightforward way to look at the returns as stockholders simply buy-and-hold the bankrupt stocks.

Our second measure also takes account of the final distributions to the pre filing common stock holders. Of these 295 firms, we are able to obtain the Chapter 11 plan of reorganization for 71 firms primarily from PACER. The company's reorganization plan contains a detailed discussion of each class of claim holders' treatments. Generally the existing common stock holders will be compensated according to the terms provided that

the required majority of creditors vote to accept the plan. Otherwise, the shareholders will receive no more from the company than they would have received in liquidation (usually nothing). In 49 out of 71 bankruptcies in our sample the old common shares were cancelled on the effective date giving existing shareholders nothing. While cash is almost never distributed to those holding old shares, a combination of new shares and warrants may be distributed. The stock in the reorganized company almost always goes largely or exclusively to its creditors.

A comprehensive way of calculating the return to the old stockholders should include the distribution to the old shareholders listed in the plan of reorganization, which requires information on: 1) the resolution of Chapter 11 filing; 2) type and amount of securities received; and 3) price of the securities on the effective date. The comprehensive holding period return (C-HPR) to old shareholders is calculated as:

C-HPR = [Ending Value – Beginning Value] / Beginning Value (2)

in which, Ending Value = Distribution per share made to old common stock holders

= [# of new shares received × Price of new shares on effective date +

# of warrants received × Value of warrant on effective date + Cash]

Beginning Value = Stock price in bankruptcy filing date

If the old shareholders retained their existing stock, the ending value will be the stock price on the effective date.

Our third measure follows Carhart (1997), which assumes that a stock's expected return is explained by the market portfolio and three factors designed to mimic the risk factors related to size, book-to-market, and momentum. The model takes the form:

$$r_{i,t} - r_{f,t} = \alpha_i + b_i(r_{m,t} - r_{f,t}) + s_i\, SMB_t + h_i HML_t + w_i\, UMD_t + \varepsilon_{i,t} \qquad (3)$$

where $r_{i,t}$ is the return on stock i at time t, $r_{f,t}$ is the risk-free rate at time t. $r_{m,t} - r_{f,t}$, SMB_t, HML_t, and UMD_t are the risk premium on the market portfolio, the difference between the returns on portfolios of small stocks and large stocks, the difference between the returns on portfolios of high and low book-to-market stocks, and the difference between the returns on portfolios of high prior returns and low prior returns. We obtained the SMB, HML, and UMD from Kenneth French database. We estimate a time-series regression for each bankrupt stock using its daily returns over the entire period during Chapter 11, and use intercept α_i as risk-adjusted return for stock i.

2.4 Descriptive Statistics

2.4.1 Duration

Duration, defined as the number of calendar days spent in Chapter 11, from the bankruptcy filing date to the final resolution date, is examined in Table 2.2. Our 295 firms have an average duration is 762 days, with a median of 511 days and maximum and minimum of 6342 days and 39 days respectively. The factors that influence duration vary from case to case. For example a company with a prepackaged bankruptcy or one that quickly converts to Chapter 7 will have a very short duration. We find that the largest two groups are from 251 days to 500 days and from 501 to 750 days, taking 30.8% and 23.1% respectively. Thus over half of our cases take approximately one to two years.

Next, in Table 2.3, we report the different Chapter 11 outcomes and corresponding duration for each of the following outcome categories: 1) emerged or reorganized; 2) liquidated or convert to Chapter 7; 3) sold, purchased, or acquired; 4) private; 5) dismissed; and 6) unknown results. The largest two groups are emerged or

reorganized and liquidated or convert to Chapter 7, representing about 27.5% and 33.2% of our sample respectively. The emerged or reorganized group has a shorter mean duration (661 days) than the liquidated or convert to Chapter 7 groups (808 days), but the median duration is longer for emerged or reorganized group (570 days) compared to liquidated or convert to Chapter 7 group (464 days).

Bankrupt stocks may be delisted from a major stock exchange during Chapter 11 when they cannot meet the listing standard, such as having insufficient capital or a stock price falling below acceptable levels. Trading on such stocks may, however, move to the Pink Sheets. In Table 2.4, we show the Chapter 11 outcome and the number of trading days for our sample. The average number of trading days is 226, which is much shorter than the average duration of 762 days, and a median of only 66 days, which is even shorter than the median duration of 511. Not surprisingly, the most successful category, emerged or reorganized, has the longest median number of trading days among all the identifiable categories. In unreported results, we have 22 firms whose trading days are less than five. Ten of them have only one day trading available in CRSP.

2.4.2 Stock price on the Chapter 11 filing date

The stocks of bankrupt firms often attract investors because of their low stock prices (often called penny stocks) as compared to their pre distressed levels. In Table 2.5, we report our sample's average stock prices on their Chapter 11 filing date. We identified 259 firms with stock prices available on their filing date. The overall average is $1.16, with a median of $0.60. The lowest filing date stock price was two cents. We also checked their stock prices one year before filing. For each stock, we take the time series average of its daily stock price in pre-1 year and then average across all the firms. One

year before Chapter 11, their average stock price was $6.28 and median of $3.93. Compared to the price on the bankruptcy filing date and their pre-1 price level, they decrease by $5.12 (81%) in the mean and $3.04 (85%) in the median, which are both highly significant at the 1% level and representing huge price deteriorations.

We also divide the stock prices into six difference ranges. A majority of the stock prices, about 69.5%, are below one dollar, with a mean of $0.43 and median of $0.35. Another 18.9% have stock prices between $1 and $2. These two groups include almost 90% of our sample. The results in Table 2.5 show that these bankrupt stocks exhibit what may seem like attractively low prices, leading to the illusion for some unsophisticated investors that if they invest in these stocks, they cannot lose much. But of course losing 100% of what is invested is possible regardless of how low the purchase price is. In an unreported result, we also calculate the price of old stocks on emergence based on their final distributions for those 71 firms with identifiable plan of reorganization. The average value of those old stocks is $0.59, with a median of $0.00, as 49 out of 71 firms cancel or extinguish their old stocks which make them worthless.

2.4.3 Sample characteristics

Table 2.6 reports the summary statistics of our variables one year before the official bankruptcy filing. The median asset value of our sample is $96.14 million with standard deviation of $3,542 million. Thus our sample does not appear to over represent either small or large firms. Not surprisingly, we find that our sample tends to suffer from negative net income, low book equity, and high book-to-market. We also construct four variables to represent the major areas of interest. We use Altman's Z-score to measure the overall bankruptcy risk. CA/TA is calculated using current assets divided by total

assets, which is a liquidity measure. EBIT/TA is calculated using earnings before interest and taxes divided by total assets, which is a profitability measure. TL/TA is calculated using the total liability divided by total assets, which is a leverage measure. We see these four variables as most directly related to our sample firms' performances. We find that our sample suffers from poor operating conditions, shown in negative Z-scores, indicating high levels of bankruptcy risk, negative profitability, and high leverage.

Table 2.7 shows the correlations between all the variables. The overall bankruptcy risk measures Z-score is highly correlated with profitability measure EBIT/TA. Therefore, putting them into the same regression would result in a high level of multicollinearity.

2.5 Results and Discussions

2.5.1 Holding period return (HPR)

Table 2.8 contains statistics for our S-HPR, C-HPR, and alpha. To make the results comparable, we also calculate the annualized HPR for S-HPR and C-HPR. Not surprisingly, we find negative returns over the holding period overall. The average annualized S-HPR, which only uses the stock price information, is -25.1%, with a median of -78.9%. The average annualized C-HPR, which involves both the stock price and the final distribution from the company to existing shareholders, is -76.9%, with a median of -100.0%. We find that the way we calculate the C-HPR generates a more severe loss compared to S-HPR. Therefore, looking at the stock price alone is not sufficient and will give investors a biased (too optimistic) result. If an investor holds the stock until the final resolution date, the distributions specified in the reorganization or liquidation plans are usually not favorable to the common stockholders, as they have the lowest priority status

among the claims. Secured claims, secured tax claims, priority non-tax claims, and some DIP claims, enjoy first priority. Usually their status will be unimpaired and they will be paid in full. Other creditor claims come next followed by preferred stock. Under absolute priority they are entitled to a full recovery before any distribution to common. Common stock, which is in the class of equity interest, is at the end of the distribution list. Even if they have the right to receive some distribution, the distribution will only be available if all the prior classes have been satisfied. Not only is the equity class impaired, the common stock will usually be extinguished or cancelled on the effective date, and will thereby become worthless. In the worst (but likely) scenario of being cancelled, the shareholders will lose every penny they have invested (-100% return).

In Table 2.9, we show the results for the groups of firms that have been eliminated from our final sample to explore whether our elimination process itself adds any bias to our results. We are able to identify three groups: 1) more than 5 is the group of seven firms whose first trading day is more than 5 days after their Chapter 11 filing; 2) Fin & Uti is the group of 55 financial and utility firms whose SIC code is between 6000 and 6799 and between 4900 and 4950; 3) No Acct is the group of 104 firms whose accounting information is not available in Compustat. We are able to obtain a plan of reorganization to calculate the C-HPR for 6 firms from the finance and utility group, and 18 firms from the no accounting information group. The results for these three groups are quite comparable in the magnitude to those of our main sample. Therefore, eliminating these firms does not appear to create a selection bias.

In Table 2.10a and 2.10b, we decompose the overall performance results by their ranges and final outcomes. Table 2.10a reveals that 80% of our sample generated a loss

for the old stockholders. Clearly, making a profit by investing in the bankrupt stocks is challenging, to say the least. We find that 149 firms in our sample suffer from an average of -90.1% loss in annualized S-HPR and 28 firms experience a loss of -100%. In annualized C-HPR, 49 firms have -100% return, resulting from stocks being cancelled or extinguished and stock holders receiving no distribution. Alpha, a measure of excess returns, also has 213 losses out of 266 with an average return of -4.5%. In Table 2.10b, the results are grouped by the Chapter 11 outcomes. In the annualized results, emerged or reorganized, and private groups suffer less compared to the other groups. Emerged or reorganized firms have -11.5% in annualized S-HPR and -64.5% on C-HPR. Firms that become private have -9.3% annualized S-HPR and -65.9% in C-HPR. Firms that liquidated, or convert to Chapter 7 is the groups that generally suffer the greatest loss.

2.5.2 Regression results

Although investing in bankrupt stocks is very likely to show losses, 60 firms enjoy a positive S-HPR and 52 firms enjoy positive alphas. In this section, we explore what factors contribute to whether an investor can profit by investing in bankrupt stocks. We categorize our HPR into positive and negative groups. Our first regression focuses on the accounting performances only, which is estimated as

$$HPR_i = \alpha + \beta_1 * CA/TA_{i,\,pre1} + \beta_2 * EBIT/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_4 * \text{Log (Total Assets)}_{i,\,pre1} + \beta_5 * B/M_{i,\,pre1} + \varepsilon_i \quad (4)$$

in which we investigate three major measures of accounting performance, liquidity which is represented by CA/TA, profitability which is represented by EBIT/TA, and leverage which is represented by TL/TA, in one year before the bankruptcy filing. We also control

for size and book-to-market at the same time. We run the regression for all HPR and for both positive and negative HPR.

The results are shown in Table 2.11. For all the HPR, we obtain significant regressions for S-HPR and alpha. For both of these two measures, CA/TA, which is our liquidity measure, is significantly positively related to S-HRR with a coefficient of 0.435 and alpha with a coefficient of 0.079, indicating that firms with higher liquidity before filing for bankruptcy tend to generate a higher stock returns during the Chapter 11 period. These results show that, overall, liquidity is more likely to be a key factor in determining the holding period returns for the distressed stocks. EBIT/TA, our profitability measure, is only significantly positively linked to alpha, and TL/TA, our leverage factor is not significant in our regression results.

Further, we categorize our returns into groups of positive and negative ones to test whether our explanatory factors play different roles between these two groups. For C-HPR, we only have five firms that offer positive HPR, therefore, we are not able to run the regression for positive C-HPR. For the positive returns, our model is good for S-HPR, but not for alpha. For S-HPR, profitability measure EBIT/TA is the key explanatory factor. The coefficient estimate is 1.718 and significant at 5% level, showing that higher profitability generally contributes to higher returns. However, liquidity and leverage are not significant in explaining the positive S-HPR. For the negative returns, the three regressions are significant at least at the 10% level. Liquidity is a key factor here as it is significant for S-HPR, C-HPR, and alpha. All three coefficient estimates are significantly positive, 0.202 for S-HPR, 0.207 for C-HPR and 0.045 for alpha, revealing that greater liquidity tends to contribute to higher returns for investors. Profitability is also an

important factor for C-HPR and alpha. We find a coefficient of 0.003 for C-HPR and 0.028 for alpha and both a significant, demonstrating that higher profitability is also associated with higher returns. Leverage is only significant in the regression for S-HPR, 0.081, indicating that higher leverage will lead to higher returns for investors. The results for C-HPR and alpha are quite comparable, as we believe that C-HPR and alpha are more comprehensive ways to show the returns, compared to S-HPR which only takes account of the stock price. Another finding surprises us is that the three accounting variables along with the two control variables produces a good model for the positive S-HPR, as it explains 23% of the return, while for the negative return, the same model can only explain about 6%-8% of the returns.

Investing in bankrupt stocks involves high risks, which mainly results from the information uncertainty inherited in the stocks and the situation for the company. As discussed by Li and Zhong (working paper, 2009), the uncertainty comes from two parts. First, as many firms are delisted from major exchanges due to their inability to meet the requirement for continued listing, and many institutional investors are restrained from holding bankrupt stocks, public information coverage becomes very limited after the official bankruptcy filing. Second, the complexity of the Chapter 11 process adds more uncertainty to the investment due to the nature of the legal process and the lower rank status of common stock holders. Therefore, we want to incorporate information uncertainty into our analysis. Zhang (2006) noted that information uncertainty mainly results from two sources. One is the volatility of a firm's underlying fundamentals and the other is poor information. He advances six proxies of information uncertainty: firm size, firm age, analyst coverage, dispersion in analyst forecasts, return volatility, and cash

flow volatility. Following his methodology, we use Stdev Pre-1 Ret, which is the standard deviation of daily returns in the year prior to the bankruptcy filing as our proxy for the information uncertainty inherent in our bankrupt company stocks.

Another interesting factor is the motivation for the bankruptcy filing. Traditionally, firms may file bankruptcy because of severe financial difficulties, such as an inability to pay its financial obligations as they come due. As discussed in the previous literature, some bankruptcy cases may be filed as a tactic for dealing with legal disputes, labor contracts, or for other strategic purposes. The troubled firms may be doing well financially, but need to file bankruptcy to address operating troubles. Therefore, in our second regression, we add a dummy variable, Distress, which takes the value of 1 if the EBIT falls below zero one year prior to bankruptcy, indicating that the firm really suffers from financial distress, and zero otherwise. Our second regression is estimated,

$$HPR_i = \alpha + \beta_1 * CA/TA_{i,\,pre1} + \beta_2 * EBIT/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_4 * Distress_{i,\,pre1} + \beta_5 * (Stdev\ Pre\text{-}1\ Ret)_{i,\,pre1} + \beta_6 * Log\ (Total\ Assets)_{i,\,pre1} + \beta_7 * B/M_{i,\,pre1} + \varepsilon_i \quad (5)$$

The overall results, shown in Table 2.12, are quite similar to what we have obtained in Table 2.11. Our model is good for S-HPR and alpha, but not for C-HPR. Liquidity still plays a positively significant role in explaining the holding period returns. One of our newly added variables, Distress, is significant in explaining alpha. With coefficient of -0.028, the result suggests that firms that file for bankruptcy due to the real financial distress, rather than strategic purposes, do tend to suffer worse stock performance. For the positive HPR, similar to the results from our first regression, the profitability measure, EBIT/TA is still significantly positive for S-HPR. The coefficient

is 1.530 and significant at 5% level. The stdev pre-1 ret is also an important explanatory factor in S-HPR. The coefficient is -17.891 and highly significant at the 1% level, revealing that the higher the volatility, the higher the information uncertainty inherent in the stock, which contributes to more negative returns. Compared to our previous regression, adding distress and stdev pre-1 ret variables make the entire regression explain 35% of the positive returns in S-HPR, increasing from 23% in our first regression. Therefore, profitability and information uncertainty are two important factors in explaining the positive HPR. For the negative returns, the results are quite similar to what we have obtained in our first regression. We still find a significantly positive coefficient for our liquidity measures, CA/TA, and profitability measure, EBIT/TA, for C-HPR and alpha. C-HPR has 0.197 as the coefficient for CA/TA and 0.003 for EBIT/TA, while alpha has 0.042 as the coefficient for CA/TA and 0.023 for EBIT/TA. However, the distress dummy and the return volatility one year prior to bankruptcy do not reveal a significant effect in explaining the negative returns. Therefore, profitability and information uncertainty play a significant role in explaining the positive returns, while liquidity and (un)profitability are the major key issues in negative returns.

2.5.3 Involvement of hedge funds

We also investigate the influence of hedge funds on the bankrupt stock performance. Hedge funds have become more and more active in corporate investment. Brav, Jiang, Partnoy, and Thomas (2008) investigate the involvement of hedge funds in corporate governance and whether their efforts impact the firm's performance. They find that hedge fund activists propose strategic, operational and financial solutions to the corporate firms and, in a majority of the cases, achieve at least partial success. Hedge

funds play a significant role in increasing the target firms' payout, operating performance, and CEO turnover. Clifford (2008) compiles a sample of active and passive hedge fund activists based on their Schedule 13D or 13G filings. He finds that the target firms of active hedge fund activists enjoy larger excess returns and increases in operating performance than the ones of passive hedge fund activists. The results imply that hedge fund activism has a positive effect on wealth creation. Boyson and Mooradian (working paper, 2010) focus on intense hedge fund activists. They document improvements in operating performance for up to three years following activism. Specifically they find such activism is associated with reduced cash position, growth in sales, reduced expenses, and increases leverage. The target firms also experience better short-term stock performance following the announcement of hedge fund involvement.

In our sample of 295 firms, we are able to identify 27 firms with 43 hedge fund investment in one year before bankruptcy from 13D/13G filing in SEC. They include some of the most famous hedge funds, such as Citadel, D. E. Shaw, Atticus Capital, and Amaranth Capital. The descriptive statistics of their holding are listed in Table 2.13. Hedge funds on average hold 7.5% common stocks of the bankrupt firms, with the largest holding 18.5%. The average holding period is about 279 days, with a median of 331 days. Another interesting fact about hedge fund investment in distressed firms is that the clustering effect, indicating that one distressed firm can attract investment from several hedge funds. In an unreported result, each target firm has about 1.6 hedge investors, with the highest one with 4 hedge fund investments.

In Table 2.14, we show the holding period return for the hedge funds. We are able to identify both the purchase date and exit date for 29 out of 43 hedge funds. Only 2

hedge funds hold the stocks through Chapter 11 cases, in which the bankrupt firms cancel their old stocks, resulting in a -100% return for these two hedge funds. For the other hedge funds, we use the stock price information on their purchase date and exit date to calculate the S-HPR. The return results for hedge funds are not optimistic, resulting in -94.6% as the mean of annualized S-HPR, and -99.6% as the median, indicating the hedge funds almost always lost all of their investment in the bankrupt firms. For alpha, we get -2.8% and -2.6% for mean and median respectively.

If investors believe that hedge funds have hot hands and they can pick up the winning stock, they will be more willing to invest in the firms with hedge fund investment. In Table 2.15, we compare the returns between firms with hedge fund investment and those without. Consistent with the results in Table 2.14, the firms with hedge fund investments actually suffer larger losses compared to the ones without hedge fund investments. The difference in annualized S-HPR is -27.9%, which is highly significant at 1% level. We also find evidence in the mean of C-HPR and annualized C-HPR, and both mean and medians of alpha. The results suggest that hedge funds might not have hot hands when investing in bankrupt stocks.

Table 2.16 shows the results of the following regression,

$$HPR_i = \alpha + \beta_1 * CA/TA_{i,\,pre1} + \beta_2 * EBIT/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_4 * Distress_{i,\,pre1} + \beta_5 * (Stdev\ Pre\text{-}1\ Ret)_{i,\,pre1} + \beta_6 * Log\ (Total\ Assets)_{i,\,pre1} + \beta_7 * B/M_{i,\,pre1} + \beta_8 * HF_{i,\,pre1} + \varepsilon_i \quad (6)$$

We add one more dummy, HF_{pre1} to our regression, which takes the value of 1 if a firm has hedge fund investment one year prior to its bankruptcy filing, and zero otherwise. The results of three accounting variables and two dummies of Distress and Stdev Pre-1

Ret are pretty similar to the ones we obtained in Table 2.12. The first result to notice is that, by adding HF dummy into our regression, we get higher R-squares and more significant models. For example, for negative alpha, the R-square increases from 9% in Table 2.12 to 24% in this table, and the F-Value also increases from 2.19 to 6.33, indicating that HF is indeed an important explanatory variables for the stock performance of bankrupt firms. Second, consistent with what we have obtained in Table 2.14 and 2.15, is that receiving hedge fund investment does not necessarily indicate better stock performances. We have significant results for overall alpha, and negative C-HPR and alpha, with coefficient of -0.070, -0.157, and -0.105, which are all significant at least at the 5% level. The negative coefficients reveal that firms with hedge fund investments actually suffer from worse stock performances compared to the ones without. Therefore, we do not find evidence of hot hands from hedge funds when they are involved in bankrupt stocks.

In summary, one major conclusion we have based on previous analysis is that investing in bankrupt stock by holding a long position will lead to severe losses, therefore, it is not as sweet as it looks when investors get into the market attracted by the record low stock price. One might believe that, as the stock price continues to plunge during bankruptcy and the final distribution may be also not in favor of common stock investors, holding a short position would change the scenario completely. However, the SEC has put new restrictions on short selling since Feb 24, 2010. First is a revised uptick rule. The old uptick rule, which states that you can only short sell at price above the last trade price, or after the last price is higher than the previous price, was eliminated by SEC on July 6, 2007. Under the old uptick rules, short selling bankrupt stocks is very limited as it is

more likely to have zero or down ticks rather than upticks. In addition, short selling requires borrowing stock in the very first step. Branch and Russel (2001) point out that the supply of bankrupt shares may be too limited to be borrowed, which may constrain short selling opportunities. In this case, one might think of naked short selling, which is a case of short selling without arranging the borrowing, but SEC has prohibited naked short selling since 2008. After the sub-prime mortgage crisis and market turmoil in 2007-2008, they impose a revised uptick rule that investors cannot short sell unless someone is willing to buy it for more than the national best bid. For bankrupt stocks, as the proceeding of its bankruptcy has great uncertainties, investors will be very hesitant to pay higher than the best bid considering the risks involved. Second is a "circuit breaker" element in the new restriction rules, which curbs the short selling when a stock price falls more than 10% from previous day's close price. This will also result in a constraint in short selling bankrupt stocks as when the distress company is close to a bankruptcy filing, its stock price usually plunges. For example, General Motors stock decreased from $1.12 on May 28, 2009 to $0.75 on May 29, 2009, about 33% plunge in stock price at two days before they officially filed for Chapter 11 protection,. Therefore, the revised uptick rule and "circuit breaker" element restrains short selling opportunities.

2.6 Conclusion

Herein we investigate the returns from investing in bankrupt stocks. Besides the traditional holding period rate and alpha from the Carhart four-factor model, we also calculate a comprehensive HPR that takes account of the final distribution specified in

the reorganization or liquidation plan. This information also plays a significant role in determining the ultimate returns to the common stock holders.

Our sample firms' stock, generally continues to be listed on major exchanges for about 226 days, with the average stock price falling to $1.16 on the bankruptcy filing date, which experiences a significant decrease compared to their level one year prior to the bankruptcy filing. The low stock prices attract unsophisticated investors who rush into this extremely volatile and uncertain market. Not surprisingly, investing in bankrupt stocks tends to generate large annualized losses: an average of -25.1% simple holding period return, and -76.9% if we take account of the final distributions.

However, we also find that achieving positive returns from investing in bankrupt stocks is possible. We run two regressions to see which factors contributed the most to whether we can make a profit or not. We find that overall speaking, liquidity is always a key factor in explaining the returns. Higher liquidity will help the firms generate higher stock returns. When separating the returns into positive and negative ones, profitability and information uncertainty plays a significant role in explaining the positive returns, while liquidity and (un)profitability are the two key issues in negative returns. In addition, the involvement of hedge funds does not show signs of better stock performance.

Table 2.1 Sample Collection Process

This table shows the steps to identify the samples to be included in this study. Initial sample of 2776 bankruptcy filing from 1978 to 2008 was obtained from bankruptcydata.com. We require that our sample remain listed on major stock exchanges after bankruptcy filing, and have trading information available in CRSP during their Chapter 11 process. No missing or still in Chapter 11 cases. Finance and utility firms and those without Compustat information are excluded from our sample.

	Number of Firms	Percentage
Initial Samples	2776	100.0%
- No CRSP Data	1007	36.3%
- No trading during Ch 11	1209	43.6%
- Data N/A or still in Ch 11	80	2.9%
- Missing trading info	19	0.7%
- First trading date is more than 5 days after Ch 11 filing	7	0.3%
- Financial and Utility Firms	55	2.0%
- No Compustat Data	104	3.7%
Final Sample	295	10.6%

Table 2.2 Overall Duration

Duration is the time (calendar days) spent in the entire Chapter 11 cases. In most cases, it is calculated as: duration = effective date – filing date. If the case is converted to Chapter 7 from Chapter 11, the duration = conversion date – filing date. If the case is dismissed, the duration = dismiss date – filing date.

Duration	N	Pct	Mean	Median	Min	Max	Std Dev
Less than 100 days	17	5.8%	57	60	39	95	25
100 to 250 days	35	11.9%	182	185	111	249	42
251 to 500 days	91	30.8%	376	369	255	497	70
501 to 750 days	68	23.1%	616	614	504	745	67
751 to 1000 days	24	8.1%	858	837	752	988	75
More than 1000 days	60	20.3%	2013	1708	1040	6342	1110
Total	295	100.0%	762	511	39	6342	831

Table 2.3 Bankruptcy Outcomes and Duration of Chapter 11 Process

We compare duration in cases with different outcomes. We have six categories of outcomes: 1) emerged or reorganized; 2) liquidated or convert o Chapter 7; 3) sold, purchased, or acquired; 4) private; 5) cased dismissed; and 6) unknown.

Outcome	N	Pct	Mean	Median	Min	Max	Std Dev
Emerged or Reorganized	81	27.5%	661	570	39	2539	525
Liquidated or Convert to Ch 7	98	33.2%	808	464	48	5508	975
Sold, Purchased, or Acquired	33	11.2%	722	539	79	3597	796
Private	11	3.7%	1055	490	187	6342	1786
Dismissed	18	6.1%	1291	1165	64	3588	962
Unknown	54	18.3%	618	476	52	2616	489
Total	295	100.0%	762	511	39	6342	831

Table 2.4 Bankruptcy Outcomes and Number of Trading Days in Chapter 11

Number of trading days is calculated as the last available date with trading information minus the bankruptcy filing date.

Outcome	N	Pct	Mean	Median	Min	Max	Std Dev
Emerged or Reorganized	81	27.5%	338	190	1	2538	426
Liquidated or Convert to Ch 7	98	33.2%	106	36	1	1431	208
Sold, Purchased, or Acquired	33	11.2%	200	84	8	864	244
Private	11	3.7%	596	9	2	6144	1841
Dismissed	18	6.1%	177	62	4	728	231
Unknown	54	18.3%	235	143	1	1178	257
Total	295	100.0%	226	66	1	6144	462

Table 2.5 Stock Price on Bankruptcy Filing Day

Of our 295 sample firms, 259 have stock price on Chapter 11 filing date available in CRSP. Pre-1 price is the average stock price of our sample in one year before bankruptcy. For each stock, we take the time series average of its daily stock price in pre-1 year. Then we take the average across all firms. The significance levels are indicated with asterisks. ***, **, and * indicate that the variable is significant at 1%, 5%, and 10% level respectively.

Price Range	N	Pct	Mean	Median	Min	Max	Std Dev
P < $1	180	69.5%	$ 0.43	$ 0.35	$ 0.02	$ 0.97	$ 0.26
$1 <= P < $2	49	18.9%	$ 1.37	$ 1.33	$ 1.00	$ 1.94	$ 0.30
$2 <= P < $5	22	8.5%	$ 3.20	$ 2.81	$ 2.00	$ 4.88	$ 1.01
$5 <= P < $10	4	1.5%	$ 7.09	$ 7.00	$ 5.75	$ 8.63	$ 1.43
$10 <= P < $15	2	0.8%	$ 12.81	$ 12.81	$ 10.88	$ 14.75	$ 2.74
P >= $15	2	0.8%	$ 16.44	$ 16.44	$ 16.00	$ 16.87	$ 0.62
Overall	259	100.0%	$ 1.16	$ 0.60	$ 0.02	$ 16.87	$ 2.09
Pre-1 Price	256		$ 6.28	$ 3.93	$ 0.18	$ 49.15	$ 7.02
Diff	256		$ -5.12***	$ -3.04***	$ -48.22	$ 7.62	$ 6.65

Table 2.6 Sample Characteristics: Summary Statistics

All the financial variables are collect from Compustat for one year prior to bankruptcy. CA/TA is current assets divided by total assets, which is a liquidity measure. EBIT/TA is earnings before interest and taxes divided by total assets, which is a profitability measure. TL/TL is total liabilities divided by total assets, which is a leverage measure.

	N	Mean	Median	Min	Max	Std Dev
Total Assets (MM$)	238	986.87	96.14	6.75	25197.00	3542.00
Net Income (MM$)	238	-150.36	-14.13	-3960.35	44.36	590.22
Book Equity	238	23.24	16.30	-2824.00	1550.20	445.31
Book/Market	238	3.25	2.54	-239.20	143.57	23.55
Z-score	238	-36.69	-1.48	-6664.82	16.57	432.85
CA/TA	238	0.46	0.48	0.00	0.97	0.25
EBIT/TA	238	-0.91	-0.06	-170.72	0.22	11.07
TL/TA	238	0.88	0.79	0.08	5.05	0.56

Table 2.7 Sample Characteristics: Correlation Matrix

Here shows the coefficients of Pearson correlations. Significance levels of the coefficients are in parenthesis.

	Total Assets	Net Income	Book Equity	B/M	Z-score	CA/TA	EBIT/TA	TL/TA
Total Assets	1.00	-0.46	0.00	0.06	0.02	-0.24	0.02	0.02
		(0.00)	(0.97)	(0.35)	(0.73)	(0.00)	(0.73)	(0.74)
Net Income	-0.46	1.00	0.50	0.11	0.42	0.20	0.43	-0.02
	(0.00)		(0.00)	(0.10)	(0.00)	(0.00)	(0.00)	(0.73)
Book Equity	0.00	0.50	1.00	0.29	0.42	0.00	0.42	-0.11
	(0.97)	(0.00)		(0.00)	(0.00)	(0.96)	(0.00)	(0.09)
B/M	0.06	0.11	0.29	1.00	0.04	0.01	0.04	-0.39
	(0.35)	(0.10)	(0.00)		(0.49)	(0.88)	(0.54)	(0.00)
Z-score	0.02	0.42	0.42	0.04	1.00	0.09	1.00	0.06
	(0.73)	(0.00)	(0.00)	(0.49)		(0.15)	(0.00)	(0.35)
CA/TA	-0.24	0.20	0.00	0.01	0.09	1.00	0.09	0.08
	(0.00)	(0.00)	(0.96)	(0.88)	(0.15)		(0.18)	(0.23)
EBIT/TA	0.02	0.43	0.42	0.04	1.00	0.09	1.00	0.07
	(0.73)	(0.00)	(0.00)	(0.54)	(0.00)	(0.18)		(0.31)
TL/TA	0.02	-0.02	-0.11	-0.39	0.06	0.08	0.07	1.00
	(0.74)	(0.73)	(0.09)	(0.00)	(0.35)	(0.23)	(0.31)	

Table 2.8 Returns of Bankrupt Stocks

S-HPR is the simple holding period return, which is calculated as S-HPR = $Price_{Last}$ / $Price_{First}$ – 1. C-HPR is the comprehensive holding period return, which is calculated as C-HPR = [Ending Value – Beginning Value] / Beginning Value, in which ending value takes care of both stocks price and final distributions to the common stock holders from the company, and beginning value is the stock price on the bankruptcy filing date. Alpha is calculated as the intercept of Carhart four-factor model. AHPR is the annualized holding period return.

	S-HPR		C-HPR		Alpha
	HPR	AHPR	HPR	AHPR	
Mean	-22.3%	-25.1%	-69.7%	-76.9%	-2.8%
Median	-40.0%	-78.9%	-100.0%	-100.0%	-1.8%
Min	-99.4%	-100.0%	-100.0%	-100.0%	-75.0%
Max	528.6%	250.1%	206.9%	78.8%	92.4%
Std Dev	82.1%	110.8%	74.3%	48.4%	10.7%
Skewness	3.96	1.67	3.07	2.26	0.99
Kurtosis	21.46	1.49	8.95	4.26	33.22
t-statistics	-4.65	-3.88	-7.90	-13.38	-4.20
N	295	295	71	71	266

Table 2.9 Statistics of Other Groups

More than 5 is the group of seven firms whose first trading date is more than 5 days after Chapter 11 filing. Fin & Uti is the group of 55 financial and utility firms whose SIC code is between 6000 and 6799 and between 4900 and 4950. No Acct is the group of 104 firms whose accounting information is not available in Compustat. We are able to obtain plan of reorganization to calculate the C-HPR for 6 firms from finance and utility group, and 18 firms from no accounting group.

	Mean			Median		
	More than 5	Fin & Uti	No Acct	More than 5	Fin & Uti	No Acct
Duration	1069	705	697	636	581	545
Trading Days Mean	576	296	239	129	96	85
Price on Filing Day	5.04	1.67	1.07	0.63	0.44	0.75
S-HPR	-42.1%**	-24.0%**	-12.1%	-40.5%*	-40.0%***	-35.0%***
S-AHPR	-44.1%*	-16.1%	-5.5%	-26.7%*	-70.6%***	-60.0%***
C-HPR	n/a	-12.2%	-45.1%**	n/a	-45.9%	-97.4%***
C-AHPR	n/a	-36.7%	-55.6%***	n/a	-47.9%	-100.0%***
Alpha	2.6%	-2.6%	-1.5%*	-2.0%	-2.0%***	-2.1%***

Table 2.10a Distribution of Returns by Range

	S-HPR						C-HPR						Alpha		
	HPR			AHPR			HPR			AHPR					
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
>100%	10	319.0%	285.7%	40	229.9%	250.1%	4	206.9%	206.9%	0			0		
(50%, 100%]	14	77.6%	80.9%	7	70.5%	70.1%	0			4	78.8%	78.8%	1	92.4%	92.4%
(0%, 50%]	36	23.7%	-25.0%	14	26.6%	25.6%	1	45.3%	45.3%	1	27.7%	27.7%	51	4.2%	1.6%
(-50%, 0%]	107	-23.1%	-70.0%	57	-20.1%	-21.8%	8	-23.6%	-22.5%	7	-15.3%	-22.2%	213	-4.5%	-2.2%
(-100%, -50%]	128	-72.1%	21.1%	149	-90.1%	-98.7%	9	-81.1%	-84.5%	10	-79.7%	-82.2%	1	-75.0%	-75.0%
-100%	0			28	-100.0%	-100.0%	49	-100.0%	-100.0%	49	-100.0%	-100.0%	0		
Total	295	-22.3%	-40.0%	295	-25.1%	-78.9%	71	-69.7%	-100.0%	71	-76.9%	-100.0%	266	-2.8%	-1.8%

Table 2.10b Distribution of Return by Chapter 11 Outcomes

	S-HPR						C-HPR						Alpha		
	HPR			AHPR			HPR			AHPR					
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
Emerged or Reorganized	81	8.5%	-28.2%	81	-11.5%	-43.1%	27	-43.2%	-100.0%	27	-64.5%	-100.0%	72	-2.6%	-1.5%
Liquidated or Convert to Ch 7	98	-40.0%	-50.8%	98	-33.2%	-98.7%	25	-90.3%	-100.0%	25	-88.9%	-100.0%	83	-3.9%	-2.0%
Sold, Purchased, or Acquired	33	-35.4%	-50.0%	33	-18.6%	-85.3%	10	-85.5%	-100.0%	10	-87.2%	-100.0%	33	-3.5%	-2.0%
Private	11	-26.8%	-22.5%	11	-9.3%	-99.1%	8	-70.9%	-100.0%	8	-65.9%	-100.0%	10	-1.6%	-2.5%
Dismissed	18	-47.5%	-54.2%	18	-67.3%	-92.0%							17	0.5%	-1.7%
Unknown	54	-19.0%	-29.3%	54	-24.0%	-63.7%	1	-100.0%	-100.0%	1	-100.0%	-100.0%	51	-2.0%	-1.7%
Total	295	-22.3%	-40.0%	295	-25.1%	-78.9%	71	-69.7%	-100.0%	71	-76.9%	-100.0%	266	-2.8%	-1.8%

Table 2.11 Regression - Accounting Performances Only

Coefficients and p-values (in parenthesis) of the following regression:

$$HPR_i = \alpha + \beta_1 * CA/TA_{i,\,pre1} + \beta_2 * EBIT/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_4 * Log\ (Total\ Assets)_{i,\,pre1} + \beta_5 * B/M_{i,\,pre1} + \varepsilon_i$$

where HPR is S-HPR, C-HPR or alpha. We categorize the holding period returns into positive and negative groups. CA/TA, EBIT/TA, and TL/TA are the three accounting measures for liquidity, profitability, and leverage in one year before bankruptcy filing. B/M is the book-to-market.

	Overall			Positive		Negative		
	S-HPR	C-HPR	Alpha	S-HPR	Alpha	S-HPR	C-HPR	Alpha
Intercept	-0.282	-1.028	0.056*	0.378	0.203*	-0.467***	-0.355***	0.002
	(0.2085)	(0.1009)	(0.0679)	(0.5406)	(0.0726)	(<.0001)	(0.0002)	(0.9360)
CA/TA	0.435**	0.475	0.079***	0.009	0.195*	0.202**	0.207**	0.045*
	(0.0507)	(0.5049)	(0.0071)	(0.9887)	(0.0571)	(0.0175)	(0.0265)	(0.0543)
EBIT/TA	0.003	0.001	0.028**	1.718**	0.031	0.001	0.003*	0.028***
	(0.5619)	(0.9328)	(0.0470)	(0.0318)	(0.7238)	(0.4400)	(0.0542)	(0.0087)
TL/TA	0.132	0.041	0.002	0.587	0.011	0.081**	0.020	-0.016
	(0.2015)	(0.8480)	(0.9049)	(0.1659)	(0.8065)	(0.0386)	(0.6392)	(0.2050)
Log(Total Assets)	0.028	0.092	-0.008*	0.080	-0.011	-0.010	-0.044***	-0.001
	(0.3641)	(0.2000)	(0.0592)	(0.5054)	(0.5919)	(0.3826)	(0.0007)	(0.7327)
B/M	0.003	0.002	0.000	0.029**	0.000	0.002*	0.000	-0.001
	(0.2941)	(0.6805)	(0.9633)	(0.0436)	(0.6068)	(0.0643)	(0.9507)	(0.1306)
R-Square	4%	8%	5%	23%	11%	6%	8%	7%
F-Value	2.17*	0.91	2.25**	2.62**	0.86	2.14*	3.10**	2.56**
N	238	56	214	49	40	175	42	174

Table 2.12 Regression – Accounting, Distress and Uncertainty

Coefficients and p-values (in parenthesis) of the following regression:

$$HPR_i = \alpha + \beta_1 * CA/TA_{i,\ pre1} + \beta_2 * EBIT/TA_{i,\ pre1} + \beta_3 * TL/TA_{i,\ pre1} + \beta_4 * Distress_{i,\ pre1} + \beta_5 * (Stdev\ Pre\text{-}1\ Ret)_{I,\ pre1} + \beta_6 * Log\ (Total\ Assets)_{i,\ pre1} + \beta_7 * B/M_{i,\ pre1} + \varepsilon_i$$

Distress is a dummy variable, which takes the value of 1 if the EBIT falls below zero in one year prior to bankruptcy, indicating that the firm really suffers from financial distress, and zero otherwise. Stdev Pre-1 Ret is the standard deviation of daily returns on one year prior to bankruptcy.

	Overall			Positive		Negative		
	S-HPR	C-HPR	Alpha	S-HPR	Alpha	S-HPR	C-HPR	Alpha
Intercept	-0.324	-0.767	0.043	-1.400	0.190	-0.505***	-0.381***	0.029
	(0.2646)	(0.3282)	(0.2677)	(0.1631)	(0.1762)	(<.0001)	(0.0014)	(0.3597)
CA/TA	0.396*	0.326	0.067**	0.364	0.194	0.196**	0.197**	0.043*
	(0.0815)	(0.6535)	(0.0252)	(0.5646)	(0.0743)	(0.0253)	(0.0412)	(0.0727)
EBIT/TA	0.003	0.000	0.020	1.530**	-0.013	0.001	0.003*	0.023**
	(0.5459)	(0.9679)	(0.1757)	(0.0495)	(0.9030)	(0.4126)	(0.0536)	(0.0434)
TL/TA	0.117	-0.038	-0.002	0.322	0.000	0.076*	0.014	-0.013
	(0.2663)	(0.8693)	(0.8682)	(0.4305)	(0.9977)	(0.058)	(0.7517)	(0.3214)
Distress	-0.136	-0.439	-0.028*	0.018	-0.051	-0.008	-0.028	-0.014
	(0.2280)	(0.1175)	(0.0752)	(0.963)	(0.4807)	(0.8384)	(0.5417)	(0.2325)
Stdev Pre-1 Ret	1.998	1.590	0.377	-17.891***	0.519	0.540	0.598	-0.243
	(0.2860)	(0.7943)	(0.1258)	(0.0099)	(0.4482)	(0.4123)	(0.4147)	(0.3221)
Log(Total Assets)	0.027	0.071	-0.008*	-0.254*	-0.012	-0.008	-0.043***	-0.003
	(0.4260)	(0.3544)	(0.0997)	(0.0733)	(0.6022)	(0.5374)	(0.0023)	(0.3735)
B/M	0.003	0.001	0.000	0.036**	0.001	0.002**	0.000	-0.001
	(0.2148)	(0.8160)	(0.7764)	(0.0102)	(0.4438)	(0.0493)	(0.9054)	(0.1834)
R-Square	5%	13%	8%	35%	15%	6%	8%	9%
F-Value	2.12*	1.02	2.38**	3.18***	0.75	1.59	2.24**	2.19**
N	238	56	214	49	40	175	42	174

Table 2.13 Hedge Fund Investment Holding and Duration

	Pct	Duration
Mean	7.5%	279
Median	6.5%	331
Min	5.0%	61
Max	18.5%	608
Stdev	2.8%	146

Table 2.14 Hedge Fund Investment Returns

	S-HPR Mean		S-HPR Median		Alpha	
	HPR	A-HPR	HPR	A-HPR	Mean	Median
HF	-84.3%***	-94.6%***	-90.0%***	-99.6%***	-2.8%***	-2.6%***

Table 2.15 HPR Comparison between With-HF and No-HF Firms

	S-HPR Mean		S-HPR Median		C-HPR Mean		C-HPR Median		Alpha	
	HPR	A-HPR	HPR	A-HPR	HPR	A-HPR	HPR	A-HPR	Mean	Median
With-HF	-34.4%	-27.3%	-45.8%	-100.0%	-100.0%	-100.0%	-100.0%	-100.0%	-8.5%	-3.0%
No-HF	-21.0%	-24.9%	-38.7%	-72.1%	-60.1%	-69.7%	-100.0%	-100.0%	-2.2%	-1.8%
Diff	-13.4%	-2.4%	-7.1%	-27.9%***	-39.9%***	-30.3%***	0.0%	0.0%	-6.3%***	-1.2%**

Table 2.16 Regression – Accounting, Distress, Uncertainty and Hedge Fund

Coefficients and p-values (in parenthesis) of the following regression:

$$HPR_i = \alpha + \beta_1 * CA/TA_{i,\,pre1} + \beta_2 * EBIT/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_3 * TL/TA_{i,\,pre1} + \beta_4 * Distress_{i,\,pre1} + \beta_5 * (Stdev\ Pre\text{-}1\ Ret)_{i,\,pre1} + \beta_6 * Log\ (Total\ Assets)_{i,\,pre1} + \beta_7 * B/M_{i,\,pre1} + \beta_8 * HF_{i,\,pre1} + \varepsilon_i$$

Distress is a dummy variable, which takes the value of 1 if the EBIT falls below zero in one year prior to bankruptcy, indicating that the firm really suffers from financial distress, and zero otherwise. Stdev Pre-1 Ret is the standard deviation of daily returns on one year prior to bankruptcy. HF is a dummy variable, which takes the value of 1 if a firms receives hedge fund investment in one year before bankruptcy filing and zero otherwise.

	Overall			Positive		Negative		
	S-HPR	C-HPR	Alpha	S-HPR	Alpha	S-HPR	C-HPR	Alpha
Intercept	-0.363	-0.808	0.029	-1.393	0.192	-0.506***	-0.414***	0.001
	(0.2131)	(0.2984)	(0.4449)	(0.1732)	(0.1825)	(<.0001)	(0.0005)	(0.9676)
CA/TA	0.365*	0.254	0.061**	0.362	0.195*	0.196**	0.173*	0.037*
	(0.0736)	(0.7235)	(0.0394)	(0.5726)	(0.0799)	(0.0270)	(0.0701)	(0.0956)
EBIT/TA	0.003	0.000	0.021	1.540*	-0.012	0.001	0.003*	0.022**
	(0.5635)	(0.9954)	(0.1532)	(0.0563)	(0.9108)	(0.4148)	(0.0605)	(0.0318)
TL/TA	0.131	0.054	0.003	0.325	0.001	0.077*	0.031	0.004
	(0.2165)	(0.8209)	(0.8285)	(0.4350)	(0.9832)	(0.0621)	(0.4871)	(0.7779)
Distress	-0.130	-0.386	0.361	0.019	0.537	0.538	0.481	-0.243
	(0.2497)	(0.1662)	(0.1354)	(0.9627)	(0.4545)	(0.4169)	(0.5081)	(0.2793)
Stdev Pre-1 Ret	1.932	0.678	-0.025	-17.861**	-0.053	-0.008	-0.020	-0.010
	(0.3018)	(0.9111)	(0.1069)	(0.0112)	(0.4836)	(0.8412)	(0.6616)	(0.3525)
Log(Total Assets)	0.034	0.080	-0.005	-0.253*	-0.013	-0.008	-0.038***	0.000
	(0.3238)	(0.2969)	(0.2579)	(0.0806)	(0.6051)	(0.5473)	(0.0076)	(0.9804)
B/M	0.003	0.002	0.000	0.037**	0.001	0.002**	0.000	0.000
	(0.1865)	(0.7298)	(0.6594)	(0.0210)	(0.4475)	(0.0500)	(0.8011)	(0.2673)
HF	-0.230	-0.439	-0.070***	0.042	0.009	-0.002	-0.157**	-0.105***
	(0.2188)	(0.1585)	(0.0042)	(0.9507)	(0.9195)	(0.9795)	(0.0257)	(<.0001)
R-Square	5%	17%	11%	35%	15%	6%	11%	24%
F-Value	1.76*	1.17	3.21***	2.72**	0.64	1.38	2.64***	6.33***
N	238	56	214	49	40	175	42	174

CHAPTER 3

HEDGE FUND INVESTMENTS IN BANKRUPTCY

3.1 Introduction

Hedge funds and bankruptcy, two seeming unrelated subjects, have attracted much attention recently. As hedged funds have grown in importance and popularity, research has focused on their return, risk, and influence on the portfolio performance of other institutional investors. An increasing number of studies have investigated hedge fund activism as it relates to corporate governance, both active and passive, intense and non-intense. The debate is centered on whether hedge funds can effectively monitor the performance of their target firms and whether hedge fund involvement can help the target firms enhance their operating performances. We are interested in extending the literature by investigating the impact of hedge funds investing in bankrupt firms proceeding through Chapter 11. Hedge funds categorized as "event driven' or "long/short equity" are the types that are likely to seek out investment opportunities in bankruptcies. Hedge funds are known for their ability to offer extraordinary returns (sometimes). The main question we address in this paper is - what is the role of hedge fund investments in those troubled firms.

Hedge fund involvement in the bankruptcy process can be categorized as either financial or strategic. The major objective of a financial player is to acquire assets that throw off cash without putting up much cash of their own. Strategic players, in contrast, seek to acquire control of the bankrupt firm, and then achieve synergies by combining it with other related holdings. Being a financial player is the major role that hedge funds play in the bankruptcy process. Brav, Jiang, Partnoy and Thomas (2008) report that hedge

funds rarely seek control in their target firms. Their average holding percentage is around 5.4% to 8.8%. They try to enhance shareholders' value through facilitating value-enhancing changes, without taking on management responsibility for the target firms.

We find that hedge funds tend to target firms with less bankruptcy risk and higher profitability than other firms that file. Prior to filing for bankruptcy protection, these firms suffer mostly from financial distress rather than economic distress. That is, their problems largely stem from too heavy a burden from debt service rather than an unprofitable strategic position. Hedge funds can help such troubled companies by providing liquidity and improve the profitability through financial restructuring. However, because hedge funds do not intend to acquire controlling stakes in the troubled firms and are organized as highly return-oriented entities, they generally only help the bankrupt firms improve in their short-term performance, usually limited to the initial post-bankruptcy year. However, these improvements are often not sustainable in the longer-run. Therefore, the involvement of hedge funds as vulture investors, who attempt to earn profit from investing in bankrupt or credit-impaired companies, in the bankruptcy process can usually only help with balance sheet issues, not strategic problems. Our conclusion is supported by both the accounting and stock performances of hedge fund invested firms.

Our paper extends the existing literature in several perspectives. First, most of current literature explores activism from the hedge fund perspective. This literature, however, usually excludes bankruptcy cases. As pointed out in Brav, Jiang, Partnoy, and Thomas (2008), the motivation, financing, and outcomes of hedge funds in bankruptcy cases are typically quite different from that of non-bankruptcy cases. However,

bankruptcy filings are important economic events (Coelho and Taffler (working paper, 2008)). As an active player in the market, the participation of hedge funds in bankruptcy, or distressed investment should not be ignored. Second, previous bankruptcy literature (Hotchkiss and Mooradian (1997)) documents that vulture investors do have impact on the post-bankruptcy performance. However, it does not differentiate various vulture investors, such as private equities and hedge funds. This is important as they may have different motivations, investment strategies, and face different regulations. Hedge funds are characterized as highly secretive investment vehicles that offer or at least seek to offer high returns, open to very limited qualified investors, and are loosely regulated. Whether these differences will impact their roles in those troubled firms is an interesting question. Last but not the least, the current literature demonstrates that hedge funds can actually help the targeted firms experience increases in payout, operating performance and stock performance. However, when they turn to distress investment, our results show that they do not perform as optimistically as we expected. Their roles are focused on providing liquidity and improve profitability. These impacts, however, only show up in the short-term. Therefore, we should not be too optimistic when hedge funds invest in bankruptcies.

We discuss the literature review the next section. Section 3 talks about our data and some descriptive statistics. Section 4 discusses our main results and we conclude our paper in section 5.

3.2 Literature Review

Researchers have investigated various areas in assessing the effectiveness of Chapter 11, including size, DIP, duration, judge effects, etc. Hotchkiss (1993) reported that firm size, measured by pre-petition assets, is the most important characteristic determining whether a firm will successfully reorganize. Many of the emerging firms downsize during Chapter 11. Denis and Rodgers (2007) find that larger firms are more likely to survive the Chapter 11 process and emerge as independent companies because they have greater resources for survival. He also finds that firms are more likely to reorganize and emerge as independent firms if they significantly reduce their liabilities while in Chapter 11. Both Carapeto (1999) as well as Dahiya, John, Puri, and Ramirez (2003) found that DIP financing success increases the probability of reorganization success. They demonstrate that having DIP financing increases the probability of emerging from Chapter 11. Li (1999) reports that the longer a firm stays in Chapter 11, the less likely is it to reorganize successfully. Denis and Rodgers (2007) found that firms with smaller size, better operating performance, and higher operating margins generally spend less time in Chapter 11.

One of the interesting factors impacting the efficiency of Chapter 11 and the post-bankruptcy performance of those that emerge, is the involvement of vulture investors. Investors, such as certain private equity and hedge funds, tend to be particularly interested in buying bankrupt or credit-impaired firms. Hotchkiss and Mooradian (1997) explore whether a vulture investor who remains active in the governance of distressed firms after they emerge from Chapter 11, has a measurable impact on post-bankruptcy performance. Improvement in performance is observed if the vulture investors join the

board, become the CEO or Chairman, and/or have control of the firm, while no significant improvement is found with passive involvement of the vulture investors. Of all the different categories of vulture investors, hedge funds draw particular attention, especially after the sub-prime mortgage crisis and Madoff investment scandal. Alexander (2008) studies the involvement of hedge funds in the bankruptcy process when hedge funds buy bonds, loans, or equity of companies in Chapter 11. Such activity can enhance liquidity for the distressed firms' securities.

Hedge fund activism is well documented in the recent literature. Brav, Jiang, Partnoy, and Thomas (2008) investigate the involvement of hedge funds in corporate governance and whether their efforts impact the firm's performance. They find that hedge fund activists propose strategic, operational and financial solutions to the corporate firms and, in a majority of the cases, achieve at least partial success. The extent of hostility is low in their sample of 2001-2006, in which hedge funds seldom seek control of the target firms. The announcement of activism also has a positive effect. Hedge funds play a significant role in increasing the target firms' payout, operating performance, and CEO turnover. Clifford (2008) compiles a sample of active and passive hedge fund activists based on their Schedule 13D or 13G filings. He finds that the target firms of active hedge fund activists enjoy larger excess returns and increases in operating performance than the ones of passive hedge fund activists. The results imply that hedge fund activism has a positive impact on wealth creation. Boyson and Mooradian (working paper 2010) focus on intense hedge fund activists. They document improvements in operating performance for up to three years following activism. Specifically they find such activism is associated with reduced cash position, growth in sales, reduced expenses, and increased leverage.

The target firms also experience better short-term stock performance following the announcement of hedge fund involvement.

In addition to the improved operating and stock performances, hedge funds also play a unique monitoring role in corporate governance. Hedge funds are managed by highly incentivized professional managers and are subject to very limited regulation. They can usually take a larger position than other institutional investors as they are not required to maintain high levels of diversification. The use of leverage helps hedge funds acquire more effective ownership of target firms. Brav, Jiang, Partnoy, and Thomas (2008) show that hedge funds seldom seek control and in most cases are non-confrontational, hence, they have few conflicts of interest thereby allowing them to act as more effective corporate governance monitors. Bratton (2007) and Kahan and Rock (2007) argue that because of their more concentrated positions compared to mutual funds and public pension funds, hedge funds may have greater incentives to monitor the corporate governance of their holdings.

3.3 Hypothesis and Data

3.3.1 Hypothesis

We aim to test the role of hedge funds in bankrupt firms. If they are able to offer strategic, operational and financial assistance to the bankrupt firms, they should be able to help these firms achieve sustainable improvements after emergence. In addition to hedge funds, other types of vulture investors such as private equity or venture capital funds may be players in the area of bankrupt firms. Their motivations and roles may vary compared to hedge funds. Therefore, we test the following two hypotheses:

Hypothesis 1: Bankrupt firms with hedge fund investments during Chapter 11 perform better after emergence compared to the ones without any vulture investment.

Hypothesis 2: Bankrupt firms with hedge fund investments during Chapter 11 perform better after emergence compared to the ones with other vulture investors, such as private equity or venture capital funds.

3.3.2 Data

Our sample collection process is described in Table 3.1. We obtained our initial sample of 1,117 firms that filed for bankruptcy between January 1978 and December 2006 from Professor Edward Altman of New York University. It contains bankruptcy filing firms with liabilities at default of $100 million or greater. We added 99 filings in 2007 and 237 filings in 2008 from bankruptcydata.com to extend our database to the most recent period. Therefore, we begin with 1,453 bankruptcy filing cases from 1978 to 2008. Next we determined the bankruptcy outcome, filing date, confirmation date, and emergence date (if any) from Lexis-Nexis, New Generation Research, and form 10-K filings with the SEC. We restricted our sample period to the 1986- 2008 period as the New Generation Research database begins with 1986 thereby excluding 68 firms that filed prior to 1986. In addition, we excluded 110 firms that were acquired or purchased, 286 firms that were either liquidated during their bankruptcy process, or converted to Chapter 7. Forty two dismissed cases and 266 undetermined cases were also dropped. From the remaining 681 reorganized firms, we obtained a sample of 254 firms that successfully emerged as public companies listed for trading in NYSE, NASDAQ, AMEX, or OTC markets. We require members of our sample to have trading information

in CRSP and accounting information in Compustat both before filing and after emergence from Chapter 11. We identified 172 companies with the required data.

Next, we manually checked the 13D/13G filings of those 172 firms during their Chapter 11 process in order to obtain a list of involved parties. 13D and 13G filings are required by the SEC when an investor acquires more than 5% of any class of securities of a publicly traded company. If a firm reports that it intends to try to influence, change the management, or seek control of the target firms, a Scheduled13D filing is required. Otherwise, a Schedule of 13G may be filed. After this step, we filter a hedge fund, either at advisor or fund level, if it satisfies one of the following: (1) the name matches the ones in CISDM or TASS database; (2) the party is featured by news article in Factiva or Lexis-Nexis as hedge fund, or hedge fund advisor; (3) the party's own website identifies it as hedge fund management company or hedge fund is one of its major lines of business. Of our 172 firm sample, we identify 16 with hedge fund(s) involvement. They include both "pure" hedge funds, such as Loeb Partners Corp, and investment firms with hedge funds as their major line of business, such as D.E Shaw. Following Agarwal, Fos, and Jiang (working paper, 2010), we exclude full-service banks who also engage in hedge funds business, such as Goldman Sachs Asset Management.

Table 3.2 reports the industry of our sample firms. Our sample largely consists of manufacturing, transportation or services firms. Companies from mining and construction and wholesale appear not to attract much attention from hedge fund investors in our sample. Following Fama and French (2001), we exclude financial firms (SIC code 6000-6999), and utilities (SIC code 4900-4999), as the financial decisions of utility firms are affected by regulation and the financial ratios of financial firms are not comparable to

those of other industrial firms. Our final sample has 142 firms with no hedge fund investment and 12 firms with hedge fund investment. Of 142 no hedge fund investment firms, we further divide them into two groups. One is 122 firms with no 13D or 13G filing, indicating no party invested more than 5% during their Chapter 11 process and the other 20 firms with significant investment not from hedge funds, but from other vulture firms, such as private equities and venture capitals.

In our 12 firms with hedge fund investment, 6 of them filed 13D, and the remaining 6 filed 13G. Ten of the hedge funds acquire common stock while one acquired preferred stocks and one debentures. The average percentage is 8.1%, with the highest at 23.8% and lowest at 5.1%. The six with 13D filings are required to disclose the purpose of the transactions. They can be categorized into "maximize shareholders' wealth", "investment purpose", and "capital structure." The average holding period of these 12 hedge fund targeted firms is 869 days, with a median of 652 days, approximately 1.7 to 2.3 years. Clearly this hedge fund investment is not short-term oriented.

In our 20 firms with other vulture investors, 3 of then filed 13Ds, and the remaining 17 filed 13Gs. All the asset classes that they purchased are common stock. The average holding is 11.7%, with highest at 33.3% and lowest at 0.7%. The purposes disclosed in the 13D file include purely investment, or to get involved in the restructuring and to try to acquire the target firm. The average holding period is 433 days, with a median of 371 days, which is shorter than for hedge funds investors.

3.4 Results and Discussions

3.4.1 Characteristics comparison between with-HF and no-vulture investors

We first investigate absolute values in the accounting performances between firms with hedge fund investment (12 with-HF investors) and firms without any vulture investment (122 no-vulture firms). As most of the data are not normally distributed, we report both t-tests for differences in means and Wilcoxon rank-sum tests for differences in medians. Table 3.3 contains the results before and Table 3.4 reports the results after emergence from Chapter 11. Ten variables are used to represent different performance aspects, shown in Appendix.

For the absolute values before Chapter 11 in Table 3.3, in pre-3, which is three years before bankruptcy filing, all 10 variables show no significant difference between with-HF and no-vulture, implying that both groups tend to be in similar shape at that time. When they approach bankruptcy, in both pre-2 and pre-1, we find the with-HF group performs significantly better than no-vulture group in median Z-score. The median differences are 1.556 two years before bankruptcy and 3.952 one year before bankruptcy, both of which are significant at the 1% level. Thus the overall bankruptcy risk is generally less severe in the with-HF group before filing for Chapter 11. In pre-2, the with-HF group outperforms the no-vulture group in the medians of two profitability measures, with significance 0.052 differences in both EBIT/Sales and ROA. In pre-1, the with-HF group also exhibits stronger performance in liquidity, profitability, and solvency, with significance 0.133 difference in WC/TA, 0.086 difference in EBIT/Sales, and 0.199 difference in Equity/TA. Therefore, compared to the no-vulture group, the with-HF firms tend to be in better shape before their Chapter 11 filing.

The Z-scores in Table 3.4 reveal that in the post-bankruptcy years, the overall level of bankruptcy risk is comparable between the two groups, in both mean and median. The mean and median Z-scores are not significantly different, between the two groups for one year, two years, and three years after emergence from bankruptcy. The with-HF group shows stronger performances in three profitability measures, EBIT/Sales, ROE and NI/Sales, one year after emergence. The differences are 0.054, 0.185, and 0.064 respectively, which are significant at least at the 10% level. However, the advantage disappears two and three years after emergence. In TL/TA and Equity/TA, with-HF group exhibits a certain level of higher leverage and solvency risk. Other variables show no significant performance differences. These results suggest that hedge funds, which are generally return-driven, may help the reorganized firms improve their profitability in order to achieve the highest holding period return on their own investment. In the longer run, however, these hedge fund investors are inclined to take their profits and move on. This conclusion is also suggested by the reported purpose of their transaction contained in their 13D files. The major goal identified is "investment purpose." Therefore, the hedge funds' long term interest in the reorganized firm may not be sustained.

In order to capture the dynamics of those characteristics, we track the change in the ten variables, and compare them across two groups, shown in Table 3.5, 3.6 and 3.7. Year over year, the decrease in the median Z-scores are significantly higher in the no-vulture group, -0.543 from pre-3 to pre-2 and -2.767 from pre-2 to pre-1, indicating that deterioration in bankruptcy risk is less severe for with-HF group. From pre-3 to pre-2, no-vulture group shows signs of decrease in liquidity, -0.018 in ΔWC/TA, in solvency risk, -0.053 in ΔEquity/TA, in profitability, -0.103 in ΔROE, and increase in leverage, 0.049 in

ΔTL/TA. From pre-2 to pre-1, the deteriorations are more dramatic in no-vulture group. We find a significant decrease in six out of the nine variables, including -0.150 in ΔWC/TA, 0.177 in ΔTL/TA, -0.177 in ΔEquity/TA, and -0.095 in ΔROA and -0.071 in ΔNI/sales. In addition, the magnitude is much larger compared to the decrease from pre-3 to pre-2. For the with-HF group, the change from pre-3 to pre-2 is not obvious. In pre-2 to pre-1, which is the most distressed period before bankruptcy, the decrease is primarily in profitability measures, -0.150 and -0.153 for mean and median in ΔROA, and -0.238 and -0.065 for mean and median in ΔNI/Sales. When we compare the with-HF with the no-vulture group, we find that the pressure for the no-vulture firms is much larger, as its performance decreases in almost all the aspects we investigated when they approach bankruptcy, while the pressure primarily comes from profitability for the with-HF group.

In Table 3.6 and 3.7, we track the changes in all the difference characteristics both between years after emergence and between post-bankruptcy and pre-bankruptcy. We also add a regression analysis using the following equation when comparing the with-HF and no-vulture:

$$\Delta\text{variable} = \alpha + \beta_1\text{HF} + \beta_2\text{LogSize} + \beta_3\text{Book/Market} + \varepsilon \qquad (1)$$

where Δvariable is the change the ten performance measures. HF is a dummy variable set to 1 if a firm has hedge fund investment and 0 if a firm does not have any greater than 5% investment during its bankruptcy process. We also control for size and book-to-market with LogSize which is the demeaned natural log of a firm's total assets and Book/Market is the demeaned book to market ratio of the firm. Following Petersen (2009), to control for autocorrelation and heteroskedasticity, standard errors are clustered at the firm level.

We first examine the changes over years after emergence in Table 3.6. From post 1 to post 2, the with-HF group experiences significant decreases in Z-scores, -1.163 in mean ΔZ-scores and -1.309 in median ΔZ-scores, showing that more severe overall bankruptcy risk beyond one year after emergence. Moreover, the underperformances in leverage, solvency risk and profitability are also significant compared to the no-vulture group, with the significant differences of 0.117 in ΔTL/TA, -0.021 in ΔEBIT/Sales, -0.092 in ΔEquity/TA, -0.069 in ΔROA and -0.304 in ΔROE. From post2 to post3, reveals no significant decrease for both groups. We find some weak evidence that the no-vulture group actually increases turnover and profitability by a limited magnitude. The regression results also show that hedge fund targeted firms do not generally enjoy better performance compared to the firms with no vulture investment. The decrease over the years after emergence rejects our Hypothesis 1 in the way that hedge funds may not play an effective role in helping distressed firms to improve in a sustainable manner.

Next, we take a look at the performance in different years after emergence compared to its pre-bankruptcy level in Table 3.7. Comparing post 1 to pre1 level, both groups enjoy significant improvements in a majority of the different aspects, such as liquidity, leverage, solvency risk, profitability, and overall distress risk. The with-HF group has 0.146 in ΔWC/TA, -0.329 in ΔTL/TA, 0.291 in ΔEquity/TA, 0.247 in ΔROA, 0.782 in ΔROE, 0.109 in ΔNI/Sales, and 1.638 in ΔZ-scores. The no-vulture group enjoys 0.220 in Δliquidity, -0.360 in Δleverage, and different amounts of increase in various profitability measures. Comparing post 2 to pre1, the scenarios starts to change between the two groups. We find that the significant increases only come from the no-vulture group. Two years after emergence, this group still enjoys substantial improvements in

liquidity, leverage, solvency risk, profitability, and overall bankruptcy risk. However, for the with-HF group's performance level two years after emergence seems no different compared to the level at one year before bankruptcy. This scenario remains the same when we compare the performances between three years after emergence and one year before bankruptcy filing. The three regressions reveal the same results when comparing post-bankruptcy with pre-bankruptcy performance, that is, hedge funds seem to play a significant role in increasing the liquidity of the bankrupt firms, with coefficients of 1.486 for post1 – pre1, 2.301 for post2 – pre1, and 2.803 for post3-pre1 periods. Another interesting result we obtain from the regressions is that the involvement of hedge funds tends to decrease the turnover ratio of the bankrupt firms, with -2.265 for the post1 – pre1, -3.298 for the post2 – pre1, and -4.445 for the post3- pre1 periods. These results further imply that the improvements in the with-HF firms tend to take place in the short-term, even though the hedge fund investment period may not be short. The major role of hedge funds in the bankruptcy process tends to be to provide liquidity.

Combining all of the results above, both in levels and changes over time, the with-HF group is generally in better shape compared to no-vulture group before the filing for bankruptcy. Hedge funds tend to target the firms with greater financial distress, such as only deterioration in profitability, rather than distress in different performance aspects. After emergence from bankruptcy, both groups make significant progress during the restructuring process, and take on comparable levels of overall risks. However, the overall improvement is stronger for the no-vulture groups, possibly because the with-HF group is less distressed before Chapter 11. The increase is significant in the with-HF group in the short run, one year after bankruptcy, but not in the long run. Therefore,

hedge funds seem to be more of financial players, providing liquidity for the troubled company, rather than a strategic player in the bankruptcy process.

3.4.2 Characteristics comparison between with-HF and other-vulture firms

In addition to hedge fund, other vulture investors, such as private equity and venture capital funds are also active players in the distressed firms arena. In this section, we explore whether their involvements have different impacts on bankrupt firms.

Table 3.8 and Table 3.9 show the levels of different characteristics between hedge funds and other vulture investors both before and after Chapter 11. For the three years before bankruptcy, the with-HF and other-vulture firms tend to suffer comparable levels of overall bankruptcy risk, as the differences between the two groups are all insignificant. Compared to other vulture investors, hedge funds tend to target firms with higher leverage, profitability, and solvency risk. The medians of TL/TA and EBIT/Sales are significantly higher for the with-HF groups in years before bankruptcy, 0.087, 0.188 and 0.162 in the median difference for TL/TA, and 0.072 and 0.025 for the median difference in EBIT/Sales. The mean and medians of Equity/TA for the with-HF group is significantly less than the ones for other-vulture groups.

In the years after emergence from Chapter 11, the overall scenario looks the same as the one before bankruptcy. The Z-scores show no significant difference between the two groups, indicating that both hedge fund and other vulture investors tend to target the firms with similar distress levels. Based on TL/TA and Equity/TA, with-HF firms still have higher levels of leverage and solvency risk compared to the other-vulture firms, in both means and medians. Hedge fund targeted firms enjoy better short-term performance

in one profitability measure, EBIT/Sales. They outperform other-vulture firms by 0.068 one year after emergence, but the advantage disappears in the following years.

Table 3.10, 3.11 and 3.12 contain the results in the change of all the characteristics over time. We also run a similar regression in Table 3.11 and 3.12 as the ones in Table 3.6 and 3.7, which is,

$$\Delta\text{variable} = \alpha + \beta_1\text{HF} + \beta_2\text{LogSize} + \beta_3\text{Book/Market} + \varepsilon \qquad (2)$$

All the variables remain the same except for HF, which will be set to 1 if a firm has hedge fund investment and 0 if one has other vulture investment.

From pre-3 to pre-2, other-vulture firms experience a significant decrease in Z-scores, -3.645 in mean and -1.595 in median. They also show worse performance in liquidity and profitability, as the with-HF outperform it by 0.018 in median ΔWC/T and 0.060 in median ΔEBIT/Sales. From pre-2 to pre-1, the situation is worse, as other-vulture firms suffer from decrease in Z-scores, liquidity, profitability, solvency, and increase in leverage, with -1.651 in ΔZ-score, -0.095 in ΔWC/TA, -0.028 in ΔEBIT/Sales, -0.079 in ΔEquity/TA, -0.342 in ΔROE, and 0.079 in ΔTL/TA. For the with-HF group, the decrease is not significant from pre-3 to pre-2. They do show a significant decrease in liquidity and profitability from pre-2 to pre-1, with -0.092 in ΔWC/TA, -0.153 in ΔROA and -0.065 in ΔNI/Sales. The scenarios here are quite similar to the ones between the with-HF and no-vulture groups. That is, other-vulture firms suffer from poor performance in almost all aspects before bankruptcy, while hedge fund targeted firms suffer mainly from liquidity and profitability.

We investigate the long-term performances in Table 3.11 and 3.12. For years after emergence, especially from post 1 to post 2, we find a significant decrease in Z-scores for

both groups, median of -1.309 for the with-HF and -2.804 for the other-vulture firms. In addition, both groups suffer from higher leverage, solvency risk, and lower profitability. The decreases are significantly higher for other-vulture firms, with 0.138 in ΔROA and 0.152 in ΔNI/Sales. From post2 to post3, both groups tend to perform similarly.

When comparing the post-bankruptcy performance to pre-bankruptcy level, in post 1 – pre 1, we find significant improvement for both groups in a majority of the aspects. The with-HF group enjoys a 1.638 increase in median ΔZ-score, and 3.014 for other-vulture firms. Besides Z-score, they also show better performance in liquidity, leverage, solvency, and profitability measures. Both groups make comparable improvements. Next, when we compare two years after emergence with pre-bankruptcy level, again, the with-HF group does not show significant differences, while the other-vulture firms show improvements in liquidity, leverage, and solvency. This improvement can even continue for three years after emergence for the other-vulture firms. The comparison between the with-HF and other-vulture firms is quite similar to the comparison between with-HF and no-vulture firms. We find that other-vulture firms exhibit long term improvement, which can last for three years after emergence. The regressions only generate significant results for post 3-pre 1, in which the HF firms enjoy higher liquidity and lower turnover ratios. However, we need to be cautious about the regression results here as the sample size for both the with-HF (12) and other-vulture firms (20) are small in the comparison here.

Based on the results above, we find that the overall bankruptcy risk is comparable between firms targeted by hedge funds and the ones by other investors. The most obvious result is that hedge funds tend to focus on the firms with higher leverage, higher

profitability, and higher solvency risk. After their emergence from bankruptcy, the with-HF group still suffers from higher leverage and solvency risk, but their profitability is comparable for the two groups, which may be because the other-vulture firms improve, or the with-HF firms decrease in this measure. Both hedge funds and other investors play an effective monitoring role in the restructuring process as a majority of the characteristics improve from their pre-Chapter 11 levels to their one year post-Chapter 11 levels, and results are equally favorable for the two groups. However, the improvements are more sustainable in the other-vulture firms, which can last up to three years after emergence, while with-HF firms only usually last up to one year.

3.4.3 Short-term and long-term stock performance between the with-HF and other two groups

In this section, we explore the market reaction around the filing date of hedge fund or other vulture investments, and the impact of these players on the stock performance of bankrupt firms. The reason why we use the filing date instead of the announcement date is that we do not have the information of when the news of stake holding will become officially public, therefore we use the filing date of 13D/G form in SEC, and we investigate several different time windows around the filing date.

We show the average holding period for the with-HF and other-vulture firms in Table 3.13. We find that the holding period of hedge funds is generally longer than the one for other vulture investors. Hedge funds hold their position in the bankrupt firms for average 869 days, median of 652 days, or around two years. Other vulture investors hold their positions for an average of 433 days, and a median of 371 days. These holding

period numbers show that hedge fund investment in bankrupt firms are not generally short-term oriented.

The annualized holding period return is showed in Table 3.14. For both with-HF and other-vulture groups, the annualized returns are not significantly different from zero, and the differences between them are not significant.

In Table 3.15, we report the market-adjusted return (MAR), which is the difference between the actual daily return and the market return, around the purchase date for both groups. We use three market return measures, CRSP value-weighted return, CRSP equal weighted return and S&P500 return. As we do not know the actual date when hedge funds or other vulture investors purchase more than 5% of the stake, we use the 13D, or 13G filing date as the purchase date and test different time windows around that date. The strongest evidence comes from the [-25, +25] event window. The with-HF group gains significant positive mean market-adjusted returns, 0.341 as to CRSP value-weighted, 0.303 as to CRSP equal-weighted, and 0.342 as to S&P500. Other-vulture firms experience significant negative market-adjusted returns, both in means and medians. We find a mean of -0.141 as to CRSP value-weighted, -0.178 as to CRSP equal-weighted, and -0.140 as to S&P500, and median of -0.144, -0.199, and -0.139 for corresponding bench marks. Comparing the with-HF and other-vulture firms, we conclude that the with-HF firms enjoy significantly higher market-adjusted returns in the [-25, +25] event window, in both mean and median. The differences are 0.482, 0.481, and 0.481 in means, and 0.504, 0.550, and 0.499 in medians for corresponding bench marks, which are all significant at least at the 5% level. In the [-10, +10] event window, we still see higher market-adjusted returns in the with-HF group compared to the other-vulture

group, with 0.348, 0.329 and 0.351 in the mean difference for different benchmarks. However, for the remaining event windows, [0, +2], [0, +10], and [0, +25] we do not find a significant difference in market-adjusted returns between the two groups.

Next, we calculate the CARs for both the with-HF and other-vulture firms in Table 3.16. We identify matching firms for both of these groups based on SIC codes, size and book-to-market. However, we do not find any significant results, possibly due to the small size of our sample.

Table 3.17a to 3.17d show the long-term stock performance both before and after Chapter 11. We calculate both absolute annual return and excess annual return compared to S&P500. Table 3.17a contains the results for the with-HF and no-vulture firms before Chapter 11. The no-vulture firms show signs of significant negative returns, both in annual return and excess return, for two years before bankruptcy, mean of -0.198 and median of -0.407 for annual return, and mean of -0.272 and median of -0.386 for excess return. In one year before the official filing, both the with-HF and no-vulture groups exhibit significantly large negative returns. In pre-1, the with-HF firms tend to suffer less compared to the no-vulture firms, with a significant positive median difference of 0.321 in annual return and 0.168 in excess return. Table 3.17b shows a similar result between the with-HF and other-vulture firms. Other-vulture firms also start showing negative annual returns and excess returns two years before Chapter 11. Both the with-HF and other-vulture firms suffer negative annual stock returns and excess returns, significant at the 1% level. However, the severity between the two groups are comparable, as we see no significant difference, both mean and median, in annual returns and excess returns for these two groups. Therefore, combining Table 3.17a and 3.17b, firms that later receive no

vulture investment are the ones that suffer the most in stock return decrease, while firms that receive hedge fund or other vulture investment suffer less in magnitude, which in turn suggests that vulture investors, no matter whether hedge or private equity funds tend to target firms with lower stock performance decreases. Table 3.17c contains the stock performance between the with-HF and no-vulture firms after emergence from Chapter 11. In the first year after emergence, we do not see a significant difference between these two groups. Surprisingly, we see that the with-HF firms actually underperform the no-vulture group two and three years after emergence. The difference is -0.725 in median annual return, and -0.519 in median excess return in post2, and -0.617 in median annual return in post3. Even though the with-HF outperforms the no-vulture before Chapter 11, the situation is reversed in the post Chapter 11 period. We find similar results in Table 3.17d. The with-HF firms are comparable to the other-vulture firms one year after emergence, however, they underperform the other group two years after leaving Chapter 11. The mean difference is -0.744 and median is -0.887 for annual returns, and -0.664 is the mean difference for excess returns and -0.751 for median difference excess returns, all of which are significant at 5%. Therefore, the with-HF group is comparable with both the no-vulture and other-vulture firms in the short-run, one year after emergence. However, the with-HF group is the worst performing group two to three years after Chapter 11.

3.5 Conclusion

Herein, we investigate the role of hedge funds in the bankruptcy process. After they acquire more than 5% of the stake in targeted troubled firms, we are interested in

their impact, compared to those with no vulture investments and the ones with investments from vultures other than hedge funds.

From accounting performance measures, we find that firms targeted by hedge funds tend to be in better shape compared to firms without vulture investments. The overall quality between hedge fund and other vulture targets are similar. Hedge fund firms tend to focus on firms with financial distress, primarily liquidity and profitability. It is also shown that these two areas are the major working areas for hedge funds during the bankruptcy process, as we find significant improvements in these two aspects after emergence from Chapter 11. However, hedge funds do not seem to help the bankrupt firms through a systematic restructuring. Moreover, improvements are only obtained in the short-run. Taking an average 8.1% stake in bankrupt firms, hedge funds are more of financial players, rather than strategic players.

The above results are also suggested by the stock performances. Even though hedge funds are not short-term investors, with an average 869-day holding period, their outperformance in the pre-bankruptcy period does not hold for the post-bankruptcy period. Before Chapter 11, the with-HF group is the group that suffers the least in the decrease in stock returns, however, the scenarios are completely reversed in the post-Chapter 11 period. That is, compared to the no-vulture and other-vulture firms, the with-HF group underperforms both of the other two groups after emergence.

Overall, the major benefit of hedge fund investment in bankruptcy cases is to provide liquidity for the troubled firms, and help them improve profitability in the short-term. Profitability orientation is understandable as short to medium term return is the

primary goal of hedge funds. Without acquiring a significant controlling stake in the firms, it may be difficult to play a systematic role in restructuring the distress firms.

Table 3.1 Data Collection Process

	Number of Firms	Percentage
Initial total	1453	
- Pre-1986 cases	68	4.7%
- Acquired/Purchased	110	7.6%
- Liquidated/Convert to Ch 7	286	19.7%
- Dismissed	42	2.9%
- Undetermined	266	18.3%
- Reorganized		
- public firms	254	17.5%
- private firms	139	9.6%
- others	288	19.8%
Reorganized public firms	254	
- CRSP & Compustat available	172	
- CRSP & Compustat not available	82	
Reorganized public firms with CRSP & Compustat Data	172	
- with hedge fund investment during Ch 11	16	
- without hedge fund investment during Ch 11	156	

Table 3.2 Industry of With-HF and No-HF Firms

Industry	With Hedge Fund	No Hedge Fund
Mining and Construction		8
Manufacturing	4	57
Transportation	4	39
Wholesale		3
Retail	2	16
Finance, Insurance, and Real Estate	2	10
Services	4	23
Total	16	156
- Finance Companies	2	10
- Utility Companies	2	4
Final Sample	12	142

Table 3.3 With-HF vs. No-Vulture Firms: Absolute Values before Chapter 11

WC/TA is working capital divided by total assets, which is a liquidity measure. Sales/TA is sales divided total assets, which is a turnover measure. TL/TA is total liabilities divided by total assets, which is a leverage measure. EBIT/TA is earnings before interest and taxes divided by total assets, which is a profitability measure. Equity/TA is shareholder's equity divided by total assets, which is a solvency measure. ROA is net income divided by total assets, ROE is net income divided by shareholder's equity, NI/sales is net income divided sales, which are three measures of profitability. Book/Market is a firm's book value of equity divided by its market value. Z-score is Altman's Z-score model, which is bankruptcy risk measure. Diff is calculated as the difference between with-HF and no-vulture firms. A t-test for means and Wilcoxon signed rank test for median differences are performed. Differences with ***, **, and * are significant at 1%, 5%, and 10% level respectively.

	WC/TA	Sales/TA	TL/TA	EBIT/Sales	Equity/TA	ROA	ROE	NI/Sales	B / M	Z-score
Pre-1 Mean										
W HF	-1.324	2.742	0.960***	-0.062	0.036	-0.191**	-1.630	-0.472*	-3.303	1.383
No Vulture	-0.475***	1.252***	1.306***	-2.011*	-0.316***	-0.733***	-0.439	-2.866**	-8.872**	-15.599***
Diff	-0.849*	1.490**	-0.346	1.950	0.352	0.542	-1.191	2.394	5.568	16.982
Pre-1 Median										
W HF	-0.009	0.850***	0.861***	0.048	0.139	-0.082***	-0.446	-0.069***	0.475	-0.546
No Vulture	-0.142***	1.026***	1.042***	-0.038***	-0.060***	-0.177***	0.162	-0.190***	-0.189**	-4.499***
Diff	0.133*	-0.176	-0.181	0.086**	0.199*	0.095	-0.608**	0.121	0.664	3.952***
Pre-2 Mean										
W HF	0.109**	1.026***	0.882***	-0.032	0.112	-0.033	-0.313	-0.211	0.536	0.903
No Vulture	-0.689	1.087***	1.589**	-3.996	-0.603	-0.533**	0.403	-6.824	2.800	-8.551**
Diff	0.797	-0.061	-0.707	3.964	0.715	0.500	-0.716	6.613	-2.264	9.454
Pre-2 Median										
W HF	0.071**	0.922***	0.864***	0.044	0.136	-0.032	-0.083	-0.019	0.797	1.078*
No Vulture	0.081**	0.855***	0.828***	-0.008**	0.150***	-0.084***	0.005	-0.079***	0.462***	-0.478***
Diff	-0.010	0.068	0.036	0.052**	-0.014	0.052*	-0.089	0.060	0.335	1.556**
Pre-3 Mean										
W HF	0.112**	0.968***	0.841***	-0.076	0.151	-0.021	-0.349	-0.231	0.931	0.994
No Vulture	-0.236	1.004***	1.102***	-1.175*	-0.112	-0.381*	0.413	-8.585	3.317	-5.683
Diff	0.348	-0.037	-0.260	1.099	0.263	0.360	-0.763	8.355	-2.386	6.677
Pre-3 Median										
W HF	0.104**	0.693***	0.821***	0.049	0.179	-0.012	-0.145	-0.015	0.481	0.820
No Vulture	0.123***	0.855***	0.775***	0.024	0.211***	-0.043***	0.010	-0.040***	0.522***	0.458
Diff	-0.019	-0.162	0.046	0.025	-0.032	0.032	-0.155	0.025	-0.041	0.363

Table 3.4 With-HF vs. No-Vulture Firms: Absolute Values after Chapter 11

	WC/TA	Sales/TA	TL/TA	EBIT/Sales	Equity/TA	ROA	ROE	NI/Sales	B / M	Z-score
Post-1 Mean										
W HF	0.126**	1.076***	0.719***	0.054	0.262***	0.038	0.313	0.018	16.432	1.665
No Vulture	-0.140	1.471***	0.954***	-10.944	0.040	-0.228**	0.238	-11.335	21.426	-6.367***
Diff	0.266	-0.394	-0.234	10.998	0.222	0.266	0.075	11.353	-4.995	8.033
Post-1 Median										
W HF	0.128*	1.083***	0.670***	0.064	0.304**	0.017	0.188	0.039	0.522	0.646
No Vulture	0.094***	1.178***	0.716***	0.010	0.277***	-0.029***	0.003	-0.025***	0.455***	0.461
Diff	0.034	-0.095	-0.047	0.054**	0.027	0.047	0.185*	0.064**	0.067	0.185
Post-2 Mean										
W HF	0.103	0.906***	0.862***	-0.086	0.122	-0.053	-0.344	-0.051	62.022	-0.052
No Vulture	0.050	1.372***	0.750***	-1.136	0.244***	-0.129***	-0.088	-0.947*	3.668	-1.690
Diff	0.053	-0.466	0.112	1.050	-0.121	0.076	-0.256	0.896	58.354**	1.637
Post-2 Median										
W HF	0.090	0.801***	0.874***	0.007	0.112	-0.059	0.017	-0.050	0.929	-0.326
No Vulture	0.092***	1.185***	0.717***	0.010	0.264***	-0.028***	-0.012	-0.023***	0.455	0.751
Diff	-0.002	-0.384	0.157*	-0.002	-0.152*	-0.031	0.029	-0.027	0.473	-1.078
Post-3 Mean										
W HF	0.091	1.081**	0.925***	-0.931	0.058	-0.015	0.119	1.135	39.629	-0.575
No Vulture	0.048	1.410***	0.773***	-1.561	0.220***	-0.095***	-0.155	-2.035	0.849	-2.062
Diff	0.044	-0.330	0.152	0.630	-0.161	0.080	0.274	3.170	38.779	1.487
Post-3 Median										
W HF	0.016	1.391**	0.863**	0.002	0.089	-0.031	0.159	-0.021	0.067	-1.320
No Vulture	0.125***	1.199***	0.712***	0.026	0.269***	-0.009*	0.047	-0.006	0.532***	1.190
Diff	-0.108	0.193	0.150	-0.024	-0.181	-0.022	0.112	-0.015	-0.465	-2.510

Table 3.5 With-HF vs. No-Vulture Firms: Changes in the Values before Chapter 11

	ΔWC/TA	ΔSales/TA	ΔTL/TA	ΔEBIT/Sales	ΔEquity/TA	ΔROA	ΔROE	ΔNI/Sales	ΔB/M	ΔZ-score
Mean of (Pre1 - Pre2)										
W HF	-1.422	1.746	0.038	-0.021*	-0.035	-0.150**	-1.281	-0.238**	-3.737	0.804
No Vulture	0.310	0.170***	-0.381	2.623	0.386	-0.112	-0.972	5.304	-9.562**	-6.251
Diff	-1.733	1.576***	0.420	-2.644	-0.422	-0.038	-0.309	-5.542	5.826	7.055
Median of (Pre1 - Pre2)										
W HF	-0.092**	0.012	0.141	-0.008	-0.042	-0.153***	-0.100	-0.065***	-0.295	-0.642
No Vulture	-0.150***	0.079***	0.177***	-0.016	-0.177***	-0.095***	-0.094	-0.071***	-0.369***	-2.767***
Diff	0.058	-0.067*	-0.036	0.008	0.135*	-0.058	-0.006	0.006	0.073	2.125**
Mean of (Pre2 - Pre3)										
W HF	-0.003	0.059	0.040	0.044	-0.039	-0.012	0.037	0.019	-0.395	-0.091
No Vulture	-0.452	0.102***	0.498	0.431	-0.503	0.064	-0.209	7.675	-0.007	-1.039
Diff	0.450	-0.043	-0.458	-0.387	0.464	-0.076	0.246	-7.656	-0.388	0.949
Median of (Pre2 - Pre3)										
W HF	0.001	0.020	0.021	0.000	-0.021	-0.005	0.040	0.001	0.082	0.110
No Vulture	-0.018**	0.031***	0.049***	-0.007	-0.053***	-0.004	-0.103***	-0.001	0.059	-0.543***
Diff	0.019	-0.012	-0.028	0.007	0.032	0.000	0.143	0.002	0.023	0.654**

Table 3.6 With-HF vs. No-Vulture Firms: Change in Values after Chapter 11, Post-t vs. Post-(t-1)

		ΔWC/TA	ΔSales/TA	ΔTL/TA	ΔEBIT/Sales	ΔEquity/TA	ΔROA	ΔROE	ΔNI/Sales	ΔB/M	ΔZ-Score
(Post2 - Post1)											
Mean	W HF	0.000	0.036	0.091**	-0.124	-0.081**	-0.066*	-0.682*	-0.054	39.629	-1.163*
	No Vulture	0.008	0.025	-0.019	11.842	0.019	-0.026	0.090	12.533	0.849	0.736
	Diff	-0.008	0.011	0.110	-11.967	-0.100	-0.040	-0.772	-12.587	38.779***	-1.899
Median	W HF	-0.050	0.051	0.114	-0.019	-0.085**	-0.078	-0.334*	-0.044	0.395	-1.309*
	No Vulture	0.003	0.033**	-0.003	0.002	0.008	-0.010	-0.030	-0.002	-0.050	0.096
	Diff	-0.053	0.018	0.117**	-0.021*	-0.092**	-0.069*	-0.304**	-0.042	0.445*	-1.405*
Reg Coef.		-0.005	-0.024	0.102	-0.108	-0.095	-0.048	-0.758	0.012	24.106**	-1.566
F-Value		2.53*	0.83	5.05***	0.81	4.14***	2.69*	0.19	0.70	30.68***	3.31**
R-Square		9%	3%	16%	3%	14%	9%	1%	3%	54%	11%
(Post3 - Post2)											
Mean	W HF	-0.009	0.009	-0.012	-0.761	0.007	0.057	0.465	1.211	16.432	0.218
	No Vulture	-0.015	0.092**	0.035	-0.224	-0.037	0.031	-0.048	-1.021	21.426	-0.965
	Diff	0.005	-0.083	-0.047	-0.537	0.045	0.027	0.514	2.233	-4.995	1.184
Median	W HF	-0.006	0.047	0.009	0.020	-0.020	0.049	0.162	0.035	-0.826	0.043
	No Vulture	-0.008	0.051**	0.006	0.007**	-0.006	0.009*	0.009	0.011*	0.004	-0.220*
	Diff	0.002	-0.003	0.002	0.013	-0.013	0.040	0.153	0.024	-0.830**	0.263
Reg Coef.		0.009	0.001	0.018	-0.844**	-0.020	-0.014	0.526	-1.452**	-66.347	0.723
F-Value		0.13	1.13	1.46	1.52	1.40	0.53	0.76	1.90	17.84***	1.00
R-Square		1%	5%	6%	7%	6%	2%	3%	8%	45%	4%

Table 3.7 With-HF vs. No-Vulture Firms: Change in Values after Chapter 11, Post-t vs. Pre-1

		ΔWC/TA	ΔSales/TA	ΔTL/TA	ΔEBIT/Sales	ΔEquity/TA	ΔROA	ΔROE	ΔNI/Sales	ΔB/M	ΔZ-Score
(Post1 - Pre1)											
Mean	W HF	1.592	-1.767	-0.220	0.127	0.204	0.232**	2.151	0.529**	21.400	0.114
	No Vulture	0.347**	0.196**	-0.367**	-9.918	0.370**	0.530**	0.630	-9.485	31.077	9.473
	Diff	1.245*	-1.963***	0.147	10.045	-0.166	-0.298	1.521	10.014	-9.676	-9.359
Median	W HF	0.146**	0.092	-0.329*	0.037	0.291*	0.247**	0.782**	0.109**	-0.218	1.638*
	No Vulture	0.220***	0.186***	-0.360***	0.041***	0.360***	0.186***	-0.058	0.165***	0.933***	4.725***
	Diff	-0.075	-0.094	0.031	-0.003	-0.069	0.061	0.840**	-0.055	-1.151	-3.088*
Reg Coef.		1.486**	-2.265***	0.118	0.077	-0.129	-0.040	2.175	0.144	-7.633	-4.047
F-Value		3.95**	3.22**	5.75***	2.65*	5.83***	1.75	1.63	2.74**	0.67	2.83**
R-Square		13%	11%	18%	9%	18%	6%	6%	9%	3%	10%
(Post2 - Pre1)											
Mean	W HF	2.220	-2.792	-0.135	0.001	0.115	0.170	1.884	0.463	77.744	-1.976
	No Vulture	0.470***	0.154**	-0.489***	1.069	0.495***	0.534**	0.320	2.172	5.100**	11.608***
	Diff	1.750***	-2.946***	0.355	-1.067	-0.380	-0.364	1.564	-1.710	72.644***	-13.584**
Median	W HF	0.077	0.047	-0.349	-0.002	0.330	0.087	0.278	0.056	0.949	1.049
	No Vulture	0.263***	0.207***	-0.337***	0.063***	0.337***	0.152***	-0.261	0.146***	0.594***	5.571***
	Diff	-0.186	-0.159	-0.011	-0.066	-0.007	-0.065	0.539	-0.090	0.355	-4.522
Reg Coef.		2.031**	-3.298***	0.231	-0.576	-0.250	-0.080	1.879	-0.513	73.011***	-7.165
F-Value		3.38**	4.63***	2.20*	3.55**	2.27*	2.10	1.76	3.56**	5.19***	2.83**
R-Square		14%	18%	9%	14%	10%	9%	8%	14%	20%	12%
(Post3 - Pre1)											
Mean	W HF	3.045	-3.934	-0.116	-0.984	0.093	0.228	0.029	1.800	75.335	-3.671
	No Vulture	0.438***	0.271**	-0.423***	0.589	0.429***	0.339***	0.543	0.283	4.409*	7.290***
	Diff	2.607***	-4.205***	0.307	-1.573	-0.335	-0.111	-0.514	1.517	70.926***	-10.961
Median	W HF	0.074	0.183	-0.354	-0.009	0.168	0.240	0.275	0.036	0.617	1.433
	No Vulture	0.323***	0.213***	-0.372***	0.046***	0.372***	0.156***	0.008	0.159***	0.863***	5.573***
	Diff	-0.249	-0.030	0.017	-0.055*	-0.204	0.084	0.266	-0.124	-0.246	-4.140**
Reg Coef.		2.803***	-4.445***	0.282	-0.738	-0.313	-0.074	0.081	2.227	70.450***	-9.686
F-Value		3.58**	5.13***	1.81	1.56	1.81	0.67	2.49**	0.72	4.22***	1.16
R-Square		16%	22%	9%	8%	9%	4%	12%	4%	19%	6%

Table 3.8 With-HF vs. Other-Vulture Firms: Absolute Values before Chapter 11

	WC/TA	Sales/TA	TL/TA	EBIT/Sales	Equity/TA	ROA	ROE	NI/Sales	B / M	Z-score
Pre-1 Mean										
W HF	-1.324	2.742	0.960***	-0.062	0.036	-0.191**	-1.630	-0.472*	-3.303	1.383
Other	-0.065	0.994***	0.786***	-0.171	0.189**	-0.293**	-2.453*	-0.354**	1.221	-11.181
Diff	-1.259	1.748	0.174	0.110	-0.153	0.101	0.822	-0.118	-4.524	12.564
Pre-1 Median										
W HF	-0.009	0.850***	0.861***	0.048	0.139	-0.082***	-0.446	-0.069***	0.475	-0.546
Other	-0.034	0.717***	0.775***	-0.024	0.171**	-0.116***	-0.126**	-0.137***	0.788*	-1.683*
Diff	0.025	0.134	0.087*	0.072*	-0.032	0.034	-0.320	0.069	-0.313	1.136
Pre-2 Mean										
W HF	0.109**	1.026***	0.882***	-0.032	0.112	-0.033	-0.313	-0.211	0.536	0.903
Other	0.092	0.858***	0.608***	-1.743	0.358***	-0.238	-0.995	-1.365	0.582***	-3.073
Diff	0.017	0.169	0.274**	1.711	-0.247*	0.205	0.683	1.153	-0.046	3.976
Pre-2 Median										
W HF	0.071**	0.922***	0.864***	0.044	0.136	-0.032	-0.083	-0.019	0.797	1.078*
Other	0.154*	0.643***	0.676***	0.019	0.324***	-0.044*	-0.049	-0.037*	0.368***	0.865
Diff	-0.083	0.280	0.188**	0.025**	-0.188**	0.012	-0.035	0.018	0.429	0.214
Pre-3 Mean										
W HF	0.112**	0.968***	0.841***	-0.076	0.151	-0.021	-0.349	-0.231	0.931	0.994
Other	0.222***	0.849***	0.526***	-1.026	0.421***	-0.100*	-0.007	-4.240	0.448***	0.572
Diff	-0.110	0.119	0.316**	0.951	-0.270**	0.079	-0.342	4.010	0.483	0.422
Pre-3 Median										
W HF	0.104**	0.693***	0.821***	0.049	0.179	-0.012	-0.145	-0.015	0.481	0.820
Other	0.190***	0.717***	0.659***	0.022	0.341***	0.004	0.005	0.010	0.309***	2.427*
Diff	-0.086	-0.024	0.162**	0.027	-0.162**	-0.016	-0.150	-0.025	0.172	-1.607

Table 3.9 With-HF vs. Other-Vulture Firms: Absolute Values after Chapter 11

	WC/TA	Sales/TA	TL/TA	EBIT/Sales	Equity/TA	ROA	ROE	NI/Sales	B / M	Z-score
Post-1 Mean										
W HF	0.126**	1.076***	0.719***	0.054	0.262***	0.038	0.313	0.018	16.432	1.665
Other	0.258***	1.077***	0.434***	-0.548	0.560***	-0.077	-0.177	-0.312	0.945***	2.104
Diff	-0.132	0.000	0.285**	0.602	-0.298**	0.115	0.491	0.330	15.487	-0.439
Post-1 Median										
W HF	0.128*	1.083***	0.670***	0.064	0.304**	0.017	0.188	0.039	0.522	0.646
Other	0.129***	0.717***	0.474***	-0.004	0.524***	0.031	0.052	0.033	0.669***	1.807
Diff	-0.001	0.366	0.195**	0.068**	-0.220**	-0.014	0.136	0.006	-0.147	-1.161
Post-2 Mean										
W HF	0.103	0.906***	0.862***	-0.086	0.122	-0.053	-0.344	-0.051	62.022	-0.052
Other	0.260***	1.098**	0.521***	-1.073	0.479***	-0.443*	-2.279	-1.313	0.506***	-5.430**
Diff	-0.157	-0.192	0.342**	0.987	-0.357**	0.390	1.935	1.262	61.516	5.378
Post-2 Median										
W HF	0.090	0.801***	0.874***	0.007	0.112	-0.059	0.017	-0.050	0.929	-0.326
Other	0.227***	0.735***	0.533***	0.006	0.467***	-0.091	-0.198	0.000	0.574***	-2.656
Diff	-0.137*	0.065	0.340**	0.001	-0.355**	0.032	0.215	-0.050	0.355	2.329
Post-3 Mean										
W HF	0.091	1.081**	0.925***	-0.931	0.058	-0.015	0.119	1.135	75.335	-0.575
Other	0.234***	0.686**	0.447***	-3.306	0.553***	-0.339	-0.445	-3.294	4.409*	-7.654
Diff	-0.143	0.395	0.477**	2.375	-0.494**	0.325	0.564*	4.429	70.926***	7.079
Post-3 Median										
W HF	0.016	1.391**	0.863**	0.002	0.089	-0.031	0.159	-0.021	0.067	-1.320
Other	0.314**	0.131**	0.405***	0.025	0.595***	-0.022	-0.037	-0.003	0.524***	-1.198
Diff	-0.297	1.260	0.458**	-0.024	-0.506**	-0.009	0.196**	-0.017	-0.457	-0.123

Table 3.10 With-HF vs. Other-Vulture Firms: Changes in Values before Chapter 11

	ΔWC/TA	ΔSales/TA	ΔTL/TA	ΔEBIT/Sales	ΔEquity/TA	ΔROA	ΔROE	ΔNI/Sales	ΔB/M	ΔZ-score
Mean of (Pre1 - Pre2)										
W HF	-1.422	1.746	0.038	-0.021*	-0.035	-0.150**	-1.281	-0.238**	-3.737	0.804
Other	-0.136***	0.071	0.125**	0.103	-0.113***	-0.043	-1.338	0.603	0.606	-7.380
Diff	-1.286	1.675	-0.087	-0.124	0.078	-0.107	0.058	-0.841	-4.343*	8.184
Median of (Pre1 - Pre2)										
W HF	-0.092**	0.012	0.141	-0.008	-0.042	-0.153***	-0.100	-0.065***	-0.295	-0.642
Other	-0.095***	0.000	0.079***	-0.028*	-0.079***	-0.108	-0.342**	-0.029	0.214	-1.651***
Diff	0.003	0.012	0.062	0.020	0.037	-0.045	0.242	-0.036	-0.509*	1.008
Mean of (Pre2 - Pre3)										
W HF	-0.003	0.059	0.040	0.044	-0.039	-0.012	0.037	0.019	-0.395	-0.091
Other	-0.130*	0.009	0.082	-0.716	-0.063*	-0.138	-0.988	2.875	0.133*	-3.645**
Diff	0.127	0.050	-0.042	0.760	0.024	0.125	1.025	-2.856	-0.528	3.554*
Median of (Pre2 - Pre3)										
W HF	0.001	0.020	0.021	0.000	-0.021	-0.005	0.040	0.001	0.082	0.110
Other	-0.017	0.000	0.008	-0.060**	-0.030**	-0.051	-0.225	-0.074	0.059*	-1.595***
Diff	0.018*	0.020	0.012	0.060*	0.009	0.046	0.265	0.075	0.024	1.705**

Table 3.11 With-HF vs. Other-Vulture Firms: Change in Values after Chapter 11, Post-t vs. Post-(t-1)

		ΔWC/TA	ΔSales/TA	ΔTL/TA	ΔEBIT/Sales	ΔEquity/TA	ΔROA	ΔROE	ΔNI/Sales	ΔB/M	ΔZ-Score
(Post2 - Post1)											
Mean	W HF	0.000	0.036	0.091**	-0.124	-0.081**	-0.066*	-0.682*	-0.054	39.629	-1.163*
	Other	-0.062	0.003	0.135**	-0.378	-0.135**	-0.376**	-2.289	-0.935**	-0.560	-7.967*
	Diff	0.062	0.033	-0.044	0.254	0.054	0.311*	1.607	0.880*	40.189	6.804
Median	W HF	-0.050	0.051	0.114	-0.019	-0.085**	-0.078	-0.334*	-0.044	0.395	-1.309*
	Other	-0.035	-0.002	0.075**	-0.009**	-0.075**	-0.216***	-0.572***	-0.195**	-0.277*	-2.804*
	Diff	-0.015	0.053	0.039	-0.010	-0.010	0.138*	0.238	0.152*	0.672*	1.495
Reg Coef.		0.031	0.035	-0.042	0.020	0.050	0.197	3.340	0.562	0.921	1.479
F-Value		0.56	0.29	0.07	4.86**	0.11	6.21***	0.81	9.81***	21.73***	3.43**
R-Square		11%	6%	2%	53%	3%	59%	16%	69%	82%	44%
(Post3 - Post2)											
Mean	W HF	-0.009	0.009	-0.012	-0.761	0.007	0.057	0.465	1.211	34.618	0.218
	Other	-0.070	-0.132**	-0.026	-1.823	0.026	0.187	0.175	-1.540	0.092	-0.441
	Diff	0.061	0.141*	0.014	1.062	-0.019	-0.130	0.291	2.751	34.526	0.659
Median	W HF	-0.006	0.047	0.009	0.020	-0.020	0.049	0.162	0.035	-0.826	0.043
	Other	-0.041	-0.096**	-0.008	-0.055	0.008	0.001	0.002	-0.057**	0.001	-0.835
	Diff	0.035	0.143**	0.016	0.076	-0.027	0.048	0.160	0.092**	-0.827**	0.878
Reg Coef.		0.061	0.235**	0.049	-0.324	-0.053	0.066	0.243	1.820	60.419	3.079
F-Value		10.75	2.32	4.08**	4.84**	4.31**	1.65	14.22***	2.53	16.41***	11.28***
R-Square		78%	44%	58%	62%	59%	36%	83%	46%	85%	79%

Table 3.12 With-HF vs. Other-Vulture Firms: Change in Values after Chapter 11, Post-t vs. Pre-1

		ΔWC/TA	ΔSales/TA	ΔTL/TA	ΔEBIT/Sales	ΔEquity/TA	ΔROA	ΔROE	ΔNI/Sales	ΔB/M	ΔZ-Score
(Post1 - Pre1)											
Mean	W HF	1.592	-1.767	-0.220	0.127	0.204	0.232**	2.151	0.529**	21.400	0.114
	Other	0.243***	0.197	-0.305***	-0.381	0.325***	0.197**	2.240	-0.039	-0.262	14.630
	Diff	1.349	-1.964	0.085	0.509	-0.120	0.035	-0.089	0.568	21.662	-14.516
Median	W HF	0.146**	0.092	-0.329*	0.037	0.291*	0.247**	0.782**	0.109**	-0.218	1.638*
	Other	0.130***	0.051	-0.270***	0.044	0.354***	0.191**	0.851**	0.255*	-0.063	3.014***
	Diff	0.016	0.041	-0.059	-0.007	-0.062	0.056	-0.069	-0.145	-0.155	-1.376
Reg Coef.		1.575	-2.097	0.139	0.570	-0.184	0.110	-0.219	0.656	13.224	-5.330
F-Value		3.72**	3.26**	2.21	2.51*	2.53*	1.27	0.07	2.36	1.25	0.71
R-Square		40%	36%	28%	31%	31%	18%	1%	29%	18%	11%
(Post2 - Pre1)											
Mean	W HF	2.220	-2.792	-0.135	0.001	0.115	0.170	1.884	0.463	77.744	-1.976
	Other	0.291**	0.094	-0.178***	-1.017	0.178***	-0.084	-0.795	-0.768	-0.895	7.740
	Diff	1.929	-2.886	0.043	1.019	-0.063	0.254	2.679	1.231	78.638	-9.716
Median	W HF	0.077	0.047	-0.349	-0.002	0.330	0.087	0.278	0.056	0.949	1.049
	Other	0.270**	0.093	-0.169***	0.023	0.169***	0.033	0.075	0.092	-0.659	1.656*
	Diff	-0.192	-0.046	-0.179*	-0.026	0.160	0.053	0.203	-0.036	1.607*	-0.607
Reg Coef.		2.757	-3.895	0.098	1.117	-0.123	0.270	3.889	1.368	62.198	-0.774
F-Value		2.89*	3.04*	1.42	1.72	1.51	0.35	0.50	2.37	0.44	6.96***
R-Square		46%	48%	30%	34%	31%	10%	13%	42%	12%	68%
(Post3 - Pre1)											
Mean	W HF	3.045	-3.934	-0.116	-0.984	0.093	0.228	0.029	1.800	75.335	-3.671
	Other	0.288**	-0.095	-0.226***	-2.996	0.226***	0.115	0.528	-2.905	-0.930	14.197
	Diff	2.757	-3.839	0.110	2.013	-0.133	0.113	-0.498	4.706	76.265	-17.869
Median	W HF	0.074	0.183	-0.354	-0.009	0.168	0.240	0.275	0.036	0.617	1.433
	Other	0.243**	0.000	-0.201**	0.026	0.201**	0.126	0.194	0.039	-0.700	2.058
	Diff	-0.170	0.183	-0.153	-0.035	-0.033	0.114	0.081	-0.004	1.317	-0.626
Reg Coef.		5.120*	-6.917*	0.236	1.164	-0.262	0.419	0.107	4.352	14.034	-2.049
F-Value		2.88	3.11	1.28	0.42	1.28	0.44	0.04	3.87*	0.26	6.67**
R-Square		59%	61%	39%	18%	39%	18%	2%	66%	12%	77%

Table 3.13 With-HF vs. Other-Vulture Firms: Length of Holding Period in Target Firms

	Mean	Median	Max	Min	Std Dev
W HF	869	652	1694	32	628
Other	433	371	704	156	224

Table 3.14 AHPR for both W-HF and Other-Vulture Firms

	W HF	Other	Diff
AHPR Mean	-0.148	-0.010	-0.137
AHPR Median	-0.148	-0.010	-0.137

Table 3.15 Market-Adjusted Returns around the Purchase Date

The market-adjusted returns are the difference between the actual return and the market return. We use three difference market return measure, CRSP value-weighted return, CRSP equal-weighted return, and S&P500 returns.

	MAR_VW				MAR_EW				MAR_SP			
	Mean	Mean Diff	Median	Median Diff	Mean	Mean Diff	Median	Median Diff	Mean	Mean Diff	Median	Median Diff
[-25,+25]												
W HF	0.341**		0.361		0.303**		0.351		0.342**		0.360	
Other	-0.141**	0.482***	-0.144	0.504**	-0.178**	0.481***	-0.199*	0.550**	-0.140**	0.481***	-0.139	0.499**
[-10,+10]												
W HF	0.298		0.308		0.276		0.289		0.298		0.308	
Other	-0.049	0.348*	-0.046	0.354	-0.053	0.329*	-0.060	0.349	-0.053	0.351*	-0.049	0.356
[0,2]												
W HF	-0.017		-0.020		-0.017		-0.013		-0.018		-0.021	
Other	0.034	-0.050	0.012	-0.032	0.033	-0.050	0.010	-0.024	0.034	-0.052	0.013	-0.034
[0,10]												
W HF	-0.014		0.006		-0.016		0.002		-0.017		0.003	
Other	0.026	-0.040	0.042	-0.036	0.022	-0.038	0.032	-0.030	0.026	-0.043	0.043	-0.039
[0,25]												
W HF	-0.079		-0.043		-0.071		-0.006		-0.083		-0.048	
Other	-0.021	-0.058	0.008	-0.050	-0.034	-0.037	-0.005	-0.001	-0.020	-0.063	0.012	-0.060

Table 3.16 CARs around the Purchase Date

CARs is the cumulative abnormal returns. We identify matched firms for both with-HF and other-vulture firms based on SIC, size, and book-to-market.

	Mean			Median		
	W HF	Other	Diff	W HF	Other	Diff
[-25,+25]	0.353	0.011	0.341	0.209	0.011	0.198
[-10,+10]	0.340	-0.007	0.347	0.315	-0.033	0.348
[0,2]	-0.021	0.052	-0.073	-0.014	0.068	-0.082
[0,10]	0.019	0.071	-0.052	0.020	0.046	-0.025
[0,25]	0.032	0.064	-0.033	0.032	0.120	-0.088

Table 3.17a Annual Return and Excess Returns: W-HF and No-Vulture Firms before Chapter 11

Excess return is the difference between annual return and S&P500 return.

	Annual Return						Excess Return					
	Mean			Median			Mean			Median		
	W HF	No Vulture	Diff	W HF	No Vulture	Diff	W HF	No Vulture	Diff	W HF	No Vulture	Diff
Pre-1	-0.487***	-0.670***	0.182	-0.487***	-0.808***	0.321**	-0.569***	-0.654***	0.085	-0.576***	-0.744***	0.168*
Pre-2	0.025	-0.198**	0.224	-0.114	-0.407***	0.293	-0.010	-0.272***	0.262	-0.294	-0.386***	0.092
Pre-3	0.757	0.264	0.493	-0.297	-0.240	-0.057	0.686	0.120	0.566	-0.251*	-0.265	0.013
Pre-4	0.090	1.782	-1.691	0.131	0.095	0.037	-0.009	1.593	-1.602	-0.103	-0.064	-0.039
Pre-5	0.087	0.258*	-0.171	0.129	0.090	0.039	-0.090	0.059	-0.149	-0.073	-0.109	0.035

Table 3.17b Annual Return and Excess Returns: W-HF and Other-Vulture Firms before Chapter 11

	Annual Return						Excess Return					
	Mean			Median			Mean			Median		
	W HF	Other	Diff	W HF	Other	Diff	W HF	Other	Diff	W HF	Other	Diff
Pre-1	-0.487***	-0.512***	0.024	-0.487***	-0.647**	0.160	-0.569***	-0.567***	-0.001	-0.576***	-0.629***	0.053
Pre-2	0.025	-0.317***	0.342	-0.114	-0.292**	0.178	-0.010	-0.442***	0.432*	-0.294	-0.537**	0.244*
Pre-3	0.757	0.226	0.531	-0.297	0.086	-0.383	0.686	0.058	0.628*	-0.251*	-0.180	-0.072
Pre-4	0.090	0.450	-0.360	0.131	-0.107	0.238	-0.009	0.237	-0.246	-0.103	-0.222**	0.118
Pre-5	0.087	0.391**	-0.305	0.129	0.263***	-0.134*	-0.090	0.207	-0.297	-0.073	0.079	-0.152*

Table 3.17c Annual Return and Excess Returns: W-HF and No-Vulture Firms after Chapter 11

	Annual Return						Excess Return					
	Mean			Median			Mean			Median		
	W HF	No Vulture	Diff	W HF	No Vulture	Diff	W HF	No Vulture	Diff	W HF	No Vulture	Diff
Post+1	0.145	0.361*	-0.216	0.190	-0.077	0.267	0.019	0.275	-0.256	0.054	-0.062	0.115
Post+2	-0.375	0.446	-0.822	-0.741	-0.016	-0.725**	-0.365	0.359	-0.725	-0.593	-0.075	-0.519*
Post+3	-0.430	0.128	-0.558	-0.744	-0.128	-0.617**	-0.289	0.026	-0.315	-0.541	-0.186**	-0.355
Post+4	0.988	0.378*	0.610	0.988	0.048	0.940	0.903	0.303	0.599	0.903	0.029	0.874
Post+5	0.458	0.058	0.400	0.458	-0.172	0.630*	0.633	0.065	0.567	0.633	-0.090	0.722*

Table 3.17d Annual Return and Excess Returns: W-HF and Other-Vulture Firms after Chapter 11

	Annual Return						Excess Return					
	Mean			Median			Mean			Median		
	W HF	Other	Diff	W HF	Other	Diff	W HF	Other	Diff	W HF	Other	Diff
Post+1	0.145	0.231	-0.086	0.190	-0.079	0.269	0.019	0.113	-0.093	0.054	-0.075	0.128
Post+2	-0.375	0.368*	-0.744**	-0.741	0.147	-0.887**	-0.365	0.299	-0.664**	-0.593	0.158	-0.751**
Post+3	-0.430	0.182	-0.612	-0.744	0.329	-1.073	-0.289	0.110	-0.399	-0.541	0.239	-0.780
Post+4	0.988	0.206	0.782	0.988	-0.028	1.016	0.903	0.185	0.717	0.903	-0.060	0.962
Post+5	0.458	0.217	0.241	0.458	0.221	0.237	0.633	0.237	0.396	0.633	0.085	0.548

APPENDIX

TEN VARIABLES USED TO REPRESENT DIFFERENT PERFORMANCE ASPECTS

WC/TA = Working Capital / Total Assets, a liquidity measure

Sales / TA = Sales / Total Assets, a turnover measure

TL / TA = Total Liabilities / Total Assets, a leverage measure

EBIT / Sales = Earnings before Interest and Taxes / Sales, a profitability measure

Equity / TA = Shareholders' Equity / Total Assets, a solvency measure

ROA = Net Income / Total Assets, a profitability measure

ROE = Net Income / Shareholders' Equity, a profitability measure

NI / Sales = Net Income / Sales, a profitability measure

Book / Market = Book Value of Equity / Market Value of Equity

Z-score = 6.56*WC/TA+3.26*RE/TA+6.72*EBIT/TA+1.05*Book Equity/TL, an overall bankruptcy risk measure

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