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# Is Cash Auction Procedure a Bargain?
# Evidence from U.S. Bankruptcy Courts

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Abstract

This paper offers large sample evidence on bankruptcy costs for more than 800 Chapter 7 and Chapter 11 cases in two U.S. bankruptcy courts. For the comprehensive sample comprising mostly of small and private firms, bankruptcy costs account for about three percent of pre-filing book asset values for both chapters. The time that firms spend in bankruptcy procedure averages about 23 months, also similar between Chapter 7 and Chapter 11 cases. Contrary to previous belief, Chapter 7 procedure, which is essentially a cash auction system, is not particularly economical or timesaving than Chapter 11 procedure. Firms with greater pre-bankruptcy assets and more complicated financial structure tend to choose Chapter 11 and incur greater bankruptcy costs. Higher management equity holdings lead to greater bankruptcy costs but cannot explain why firms choose Chapter 11 instead of Chapter 7.

Designing an optimal bankruptcy procedure has received great attention during the last two decades. A central theme of the debate focuses on whether a negotiation procedure (like the chapter 11 in the U.S.) or a cash auction (like the Chapter 7 in the U.S.) is more efficient.

To reliably evaluate the two competing bankruptcy systems, one has to understand the benefits and, particularly the costs of alternative bankruptcy systems. Unfortunately, existing studies have reached little agreement about which system is more costly. Gertner and Scharfstein (1991) and Bebchuck and Chang (1991), for example, provide theoretical argument that Chapter 11 tends to encourage excessive continuation and deviation from absolute priority rule. On the other hand, Shleifer and Vishny (1998) argue theoretically that cash auction system may suffer from considerable transaction costs and discounted value due to illiquidity.

Extensive empirical studies have shown that Absolute Priority Rule (APR) is often violated under Chapter 11 (i.e. Eberhart et al, 1990; Franks and Torous, 1994; Betker, 1995) and this undermines the efficiency of Chapter 11. Meanwhile, Pulvino (1998) and Stromberg (2001) find that asset fire sale and resale to management can lead to striking inefficiency in cash auction system, too. Therefore, researchers have to look for other criteria, such as bankruptcy costs, to evaluate the two competing systems.

Many extant studies use bankruptcy costs as another criterion in evaluating bankruptcy systems. Altman (1984), Hotchkiss (1995), and Weiss and Wruck (1998), among others, find significant costs in Chapter 11 while Alderson and Betker (1995), Gilson (1997) and Maksimovic and Phillips (1998) find evidence of low bankruptcy costs. Results from international comparison also generate mixed results. Thorborn

(2001) finds that cash auction system in Sweden takes much shorter and is more efficient than the Chapter 11 system in the U.S. On the other hand, Ravid and Sundgren (1998) find U.S. system is more efficient by comparing bankruptcy costs of the U.S and Finnish Bankruptcy codes. Therefore, further study is needed to better understand the direct and indirect costs of competing bankruptcy systems, which is the focus of the current study.

This study offers large sample evidence on direct costs and the time spent in bankruptcy for Chapter 7 and Chapter 11 in U.S. bankruptcy court. By comparing the direct and indirect costs for U.S. cash-auction and negotiation bankruptcy cases, we find little difference in the bankruptcy costs for the two bankruptcy systems, in contrast with previous findings that cash auction system and negotiation systems incur considerably different bankruptcy costs (Thorburn, 2000; Ravid and Sundgren, 1998).

Unlike previous studies (i.e. Weiss, 1990; Franks and Torous, 1989) that focus on large public companies in Chapter 11, the current study includes all firms that filed bankruptcy during the sample period. A dominant fraction of our sample consists of small and private firms. 104 out of 265 (39.21 percent) firms have less than $1 million in book asset values before bankruptcy filing[1] and 249 out of 265 our sample firms (93.9 percent) are private firms.[2] Using data on all Chapter 7 and Chapter 11 bankruptcy court filings from the Southern New York Bankruptcy Court (New York court, hereafter) and Arizona Bankruptcy Court (Arizona court, hereafter) within a comparable sample period, we present a comprehensive sample of cases in both procedures and avoid potential issues in comparing bankruptcy systems in different countries and different periods.

The ratio of direct bankruptcy costs to pre-bankruptcy assets and the time that firs spend in bankruptcy are very similar in Chapter 7 and Chapter 11 bankruptcy procedures. The median direct bankruptcy costs are 63,867 dollars and 1,854 dollars for Chapter 11 and Chapter 7 procedure, respectively. These amount account for 3.34 and 3.38 percent of pre-bankruptcy book values of assets. Median firms spend 696 days (23 months) in Chapter 11 cases and 694 days (23 months) in Chapter 7 cases, indicating virtually no difference between the time that firms spend in cash auction and negotiation systems. If the time that firms spend in bankruptcy can proxy for the indirect costs of bankruptcy (Gilson et al. 1990), our results indicate that, considering both direct and indirect costs, Chapter 7 bankruptcy procedure is not particularly efficient than Chapter 11 procedure within U.S.

Additional analyses further strengthen our major findings. For a sub-sample of firms with assets between $100,000 and $1,000,000, the relative direct bankruptcy costs to pre-bankruptcy assets are similar for Chapter 11 cases (8.7 percent) and Chapter 7 cases (10.5 percent) filed by Firms. The difference between the time that such firms spend in Chapter 11 (638 days) and Chapter 7 (577 days) is also modest. In addition, the firms that convert their cases from chapter 11 to Chapter 7 indeed take longer (686 days) than their counterparts in Chapter 7 (672 days) to finish.

The existence of two bankruptcy procedures gives managers and creditors an opportunity to choose which procedure suits the firm better. Our data on both Chapter 7 and Chapter 11 cases allow us to examine what induces firms to enter either procedure. We find that firms with greater pre-bankruptcy assets are more likely to file and stay in Chapter 11. Different from Gertner and Scharfstein (1991)'s prediction, management

equity holding does not influence firms' decision of entering Chapter 7 or Chapter 11. Firms with higher management equity holding incur considerably higher bankruptcy costs, which supports their argument that managers and equity holders tend to exploit their bargaining power and incur greater costs in reorganization.

Our contribution to the literature lies in threefold. First, we offer comprehensive large sample evidence on the direct and indirect bankruptcy costs of cash-auction and negotiation bankruptcy system in the U.S. during a recent period. Our data are representative and do not bias toward large public companies. Consistent with the results summarized in Thorburn (2000), the direct bankruptcy costs account for about three percent of bankruptcy firm's total assets. Firms in both chapters spend about two years in bankruptcy, which is also similar to the results in previous study. Given that most companies in previous studies are large public companies, our results indicate that firms of different sizes spend similar time in bankruptcy. We also find in our large sample of Chapter 11 cases that higher total assets, debt-to-asset ratio and management equity holding are associated with higher bankruptcy costs.

Further, we note that firms in Chapter 7 are much smaller and simpler in financial structures. The fact that direct and indirect costs are similar for Chapter 7 and Chapter 11 cases also indicates that, in addition to the scale effect in bankruptcy costs (Ravid and Sundgren, 1998), there is also a significant fixed cost associated with bankruptcy procedures. Considering the fixed costs in both procedures helps one better understand the systematic component of bankruptcy costs and evaluate the efficiency of competing procedures.

Second, our study offers additional evidence that helps resolve the debate about the efficiency of cash auction and negotiation bankruptcy system and can therefore provide important policy implication on U.S. bankruptcy legislation.

Thorborn (2000) shows with Swedish data that "cash auction bankruptcy system is a surprisingly efficient restructuring mechanism for small firms." One particular piece of her evidence is that cash auction system in Sweden costs less and works much faster than Chapter 11 in the U.S., given similar ex-post survival and recovery rate. Such international comparison does not go unchallenged. Ravid and Sundgren (1998) find the opposite by comparing the bankruptcy costs of U.S. and Finnish bankruptcy systems.

One reason why previous attempts generate different results is that the comparability of bankruptcy systems in different countries and different periods is low. First of all, the firm characteristics are quite different across countries, which can directly influence the bankruptcy procedure.[3] Additionally, the difference in judicial system, culture and business practices across countries can also render the international comparison inconclusive. Finally, given our findings on the changes in bankruptcy costs over time, it is also important that researchers compare the bankruptcy costs from similar periods.

As a result, it is desirable if one can compare the bankruptcy costs of cash auction and negotiation systems within a single country during a similar period. The United States is among the few countries with both a negotiation procedure (Chapter 11) and a cash-auction procedure (Chapter 7) for bankruptcy systems. Therefore, comparing the costs of Chapter 7 and Chapter 11 within the U.S. during the same period allows the

current study to circumvent above issues and reliably compare the bankruptcy costs of competing procedures.

We show that the relative direct costs (the ratio of direct costs to pre-bankruptcy book assets) and the indirect bankruptcy costs, which is proxied by the time that firms spend in bankruptcy, are both similar between Chapter 7 and Chapter 11. This indicates that bankruptcy costs may not be an important criterion when evaluating the efficiency of Chapter 7 and Chapter 11. Instead, future research should focus on other issues, such as distribution of bankruptcy proceeds among claimholders, when examining the respective efficiency of these two systems.

Our results find the bankruptcy costs on Chapter 7 procedure is much smaller than previously reported (White 1984 and Lawless et al. 1994). This indicates that the bankruptcy Reform Act of 1994 is effective in reducing overall bankruptcy costs. Nevertheless, it is still surprising that Chapter 7 cases are not particularly cheaper given the firms' smaller size and simpler financial structure. This brings attention to why cash auction system in U.S. takes much longer than those in other countries. Answers to this question can potentially improve the efficiency of U.S. bankruptcy system.

Finally, we offer empirical evidence on the characteristics of the firms that choose Chapter 7 or Chapter 11. Firms filing for Chapter 7 are on average smaller and in more severe financial distress. Firms with lower pre-bankruptcy assets and debt-to-asset ratio are more likely to convert to Chapter 7 from Chapter 11. In contrast with previous prediction (Baird 1992), there is little evidence that management equity holding induces them to choose Chapter 11.

The rest of this study is organized as follows: Section 2 describes the data on bankruptcy filings from U.S. bankruptcy court; Section 3 investigates the direct costs and the time that firms spend in bankruptcy for Chapter 7 and Chapter 11 cases and studies firm characteristics that influence bankruptcy costs; Section 4 studies the characteristics of firms filing for different chapters and converting cases from Chapter 11 to Chapter 7; and Section 5 concludes.

## 2. Data

We collect our sample data from U.S. bankruptcy court filings. We include all closed cases filed under Chapter 7 and Chapter 11 between 1995 and 2001 to keep our data representative. Staring in 1998, several regional U.S. bankruptcy courts started making Bankruptcy filings available to the public.[4] In this study, we focus on cases filed in Arizona bankruptcy court and Southern New York bankruptcy court because these two courts have made available much more cases than any other bankruptcy court did. These two courts also provide a balanced sample in a sense that Southern New York Bankruptcy Court records bankruptcy cases by many large companies while most firms filed in Arizona court are small.

The filings in Arizona court date back to 1998 and New York Court includes some cases back to 1994. Because we find that average bankruptcy cases take about two years to finish, cases filed after 1999 in our sample tend to be faster in closing. We perform several robustness tests to address the potential selection bias in our sample. Our major findings remain robust.

Our final sample includes 265 Chapter 11 cases whose plans of reorganization are confirmed by court before the end of 2002. 144 cases were filed in Arizona court and the remaining 121 were filed in New York court. Chronically, there are 38 cases filed between 1994 and 1996, 30 cases in 1997, 43 cases in 1998, 31 cases in 1999, 95 cases in 2000, and 28 cases after 2000.

The summary statistics of these cases are reported in Table 1. It is obvious that the bankruptcy cases are much bigger in New York court. The median pre-bankruptcy book assets and liabilities for the whole sample are $977,796 and $1,541,668, respectively. The median debt-to-asset ratio is 1.28. The median pre-bankruptcy asset in New York court ($1,345,372) is more than 50 percent bigger than the median pre-bankruptcy assets in Arizona court ($805,783). The pre-bankruptcy debt for New York firms ($2,320,000) is more than twice as big as the pre-bankruptcy debt for Arizona court firms ($1,051,835). Related to the absolute size of assets and liabilities, firms in New York Court are in greater financial distress (debt-to-asset ratio=1.55) at the bankruptcy filing than Arizona firms (debt-to-asset ratio=1.07). In addition, there is unsecured creditors' committee in 15.6 percent of all Chapter 11 cases. Banks are secured and unsecured creditors in 26.3 and 14.6 percent of all Chapter 11 cases.

One advantage of our data is that we have both large public companies and small private companies, which are different in several distinctive ways. While public companies have diverse equity and debt holders, private companies have more concentrated equity and debt ownership. Also, private firms suffer less from the agency problem between management and shareholders because managers are also equity holders in many cases. Further, the major equity holders are also company presidents in

many private firms in bankruptcy.[5] Therefore, it is important to consider the bankruptcy costs for firms of all sizes.

Previous studies have focused primarily on large and public companies in studying the bankruptcy costs. Out of the 265 cases in our sample, only 17 (6.42 percent) cases are filed by public companies.[6] Despite their significant economic impact, large public companies make up only a small fraction of the bankruptcy sample in terms of the number of cases filed. By including available bankruptcy cases of all sizes, our study offers a representative description of bankruptcy costs.

The data on Chapter 7 cases come from the same source. Because we have much more observations for Chapter 7 cases and it is laborious and time consuming to go through all available Chapter 7 cases, we only include cases filed between 1998 and 2000. There are 2,049 (544 in 1998, 763 in 1999, and 742 in 2000) in Arizona court and 18,261 Chapter 7 cases in New York court (3,564 in 1998, 4,353 in 1999, 10,344 in 2000). There are remaining assets to be distributed in 171 cases in Arizona court and 504 cases in New York court. We focus only on these 675 cases. Chronically, there are 228, 234, and 211 included cases in 1998, 1999, and 2000. For New York court, the court filings are incomplete for some cases before 2000, which could potentially bias our results toward cases that are closed later.

A large fraction of the Chapter 7 cases are personal bankruptcy filings because Chapter 7 is widely used as a way to precede personal bankruptcy. 541 (80.2 percent of the entire sample) Chapter 7 cases are individual bankruptcy cases and the remaining 134 cases (19.8 percent of the entire sample) are firm bankruptcy cases. The total assets and

liabilities are higher for firm cases and the debt-to-asset ratio is lower. 46 cases (6.8 percent of the entire sample) were originally filed under Chapter 11 and later converted into Chapter 7 and 16 cases (2.4 percent of the entire sample) were originally filed under Chapter 13 and later converted into Chapter 7.

## 3. Bankruptcy Costs of Chapter 11 and Chapter 7 Procedures

### 3.1. Direct Bankruptcy Costs

There are three major types of costs associated with Chapter 11 filing in the data: professional compensation for lawyers, professional compensation for auditors, and compensation for other professional services such as evaluation and auction. For the cases in which unsecured creditors are represented by the committee of unsecured creditors (the committee, hereafter), the compensation for lawyers includes the compensation for lawyers to both the debtors and the committee. The managers of debtor-in-possession are also compensated throughout the bankruptcy procedure. We do not consider this because managers have to be paid for running the firm in any event.

The summary of direct bankruptcy costs is reported in Table 2. The median direct bankruptcy costs are $63,867 for Chapter 11 cases. The median direct bankruptcy cost for Arizona cases is $20,634 and that for New York cases is $101,901. The mean direct bankruptcy costs for the entire sample, Arizona firms, and New York firms are $316,714, $170,190, and $411,756, respectively. Because direct bankruptcy cost is strongly positively skewed, median offers better description of the sample. In relative term, the direct costs account for 3.34 percent of total book assets before bankruptcy filings. This result is largely in line with the results on bankruptcy costs for public firms in Weiss

(1990) and smaller than results in most previous studies (Warner, 1977; White, 1983; Lawless et al., 1994). For Arizona firms, direct bankruptcy costs account for 2.21 percent of pre-bankruptcy book assets. For New York firms, direct bankruptcy costs account for a much higher 6.65 percent of pre-bankruptcy book assets. Compensation for lawyers accounts for about 90 percent of all direct bankruptcy costs. This is consistent with Lawless et al. (1994) that legal costs account for a dominant fraction of the entire direct bankruptcy costs in Chapter 11.

For Chapter 7, direct bankruptcy costs primarily consist of two parts, the compensation to the trustee and the lawyer to the debtor. A trustee is usually elected to take over the debtor and liquidate its remaining assets in Chapter 7 cases. For the 542 Chapter 7 cases with direct bankruptcy cost data, the median direct bankruptcy costs are $1854.44 ($1212.09 for Arizona cases and $2,500 for New York cases).[7] These bankruptcy costs account for 3.38, 2.54, and 4.17 percent for the entire sample, Arizona cases and New York cases, respectively.

Bankruptcy trustees in Chapter 7 get compensated following certain stipulations.[8] This compensation scheme makes trustee costs a larger fraction of direct bankruptcy costs in smaller cases with less assets to be distributed. For all Chapter 7 cases, lawyer expenses and trustee compensation account for 36.1 (mean=38.3) and 34.6 (mean=39.2) percent of total direct bankruptcy costs, respectively. For personal cases, lawyer and trustee compensation make up 44.8 (mean=42.3) and 44.0 (mean=47.3) percent of bankruptcy costs. For firm Chapter 7 cases, lawyer and trustee compensation make up 34.4 (mean=32.7) and 23.6 (29.8) percent of bankruptcy costs.

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The most striking result so far is that, the relative direct bankruptcy costs, in percentage of direct bankruptcy costs to total pre-bankruptcy book assets, are very similar for Chapter 7 and Chapter 11 cases. The median relative bankruptcy costs for Chapter 11 and Chapter 7 are 3.34 and 3.38 percent, respectively. In contrast with Thorburn's findings (2000) that cash auction system is less costly and much quicker by comparing bankruptcy systems in the U.S. and Sweden, we find little evidence that the relative direct costs are significantly smaller for Chapter 7 cases. In addition to the scale effect in bankruptcy costs (Ravid and Sundgren 1998), there also seems to be fixed a factor in bankruptcy costs. Although firms in Chapter 11 are much bigger, the relative direct bankruptcy costs are similar between Chapter 7 and Chapter 11 procedures.

Because a large fraction of Chapter 7 cases are personal bankruptcy filings, we separate the sample into firm and personal Chapter 7 cases and redo the analysis. For the 541 individual and 134 firm Chapter 7 cases, the median direct bankruptcy costs is $ 1,555 (mean=$4,620) and $ 7,672 (mean=$29,957), respectively. This constitutes 3.07 (mean=4.85) and 7.89 (mean=37.4) percent of pre-bankruptcy book assets.

To further check the robustness of our results, we next examine the direct bankruptcy costs for a sub-sample of similar firms in both Chapter 7 and Chapter 11. Specifically, we compare the direct bankruptcy costs for all firm bankruptcy cases with pre-bankruptcy assets between $100,000 and $1,000,000 in both chapters. For this sub-sample of firms, we obtain results similar to our main findings. Chapter 11 firms in the sub-sample are still significantly bigger than the Chapter 7 firms.[9] Surprisingly, the median ratio of direct costs to pre-bankruptcy assets (8.70 percent) for Chapter 11, is indeed smaller than the 10.49 percent of for Chapter 7. However, this result is not

significant and again indicates that Chapter 7 cases involve similar level of costs as Chapter 11 cases do.

*3.2. Time spent in Bankruptcy*

Unlike direct costs, indirect bankruptcy costs are more difficult to define and measure. We follow the approach by previous studies (Franks and Torous 1994 and Thorburn 2000) and use the time that firms spend in bankruptcy as a proxy for indirect costs.[10] The rationale is that indirect bankruptcy costs, such as bankruptcy's adverse impact on product and capital markets, increase with the time that firms spend in bankruptcy.

The time that firms spend in bankruptcy procedure is reported in Table 4. Because information on the length of cases is available on more cases, we have more observations on indirect bankruptcy costs. The major finding is that, consistent with our findings on direct bankruptcy costs, the indirect bankruptcy costs are also similar between Chapter 11 and Chapter 7 cases. The median time that Chapter 11 and Chapter 7 cases spend from case filing to case closure is 696 days (23 months) and 694 days (23 months), respectively. The mean time that Chapter 11 and Chapter 7 cases take is 784 days (26 months) and 698 days (23 months), respectively. Similar to direct costs, we also compare the time spent in bankruptcy for the sub-sample of firms with pre-bankruptcy assets between $100,000 and $1,000,000. Results in Table 3 show that Chapter 11 firms spend 638 days (21 months) in bankruptcy, about 2 months longer than the median time that Chapter 7 firms spend 577 days (19 months). This difference is again modest considering the differences in firm sizes.

In sum, our findings on direct bankruptcy costs and the time that firms spend in bankruptcy both indicate that cash auction procedure (Chapter 7) is not more efficient than negotiation procedure (Chapter 11), from the perspective of bankruptcy costs. Therefore, future studies should be devoted to investigate other dimensions of efficiency, such as debt recovery, firm survival, and distribution among claimholders, to better evaluate the competing bankruptcy systems.

Similar to the case in direct bankruptcy costs, indirect bankruptcy costs are greater for cases filed in New York than those filed in Arizona. For Chapter 11 cases, the median case in New York takes 766 days (26 months) and the median case in Arizona takes 646 days (22 months). For Chapter 7 cases, the median case in New York takes 764 days (26 months) and the median cases in Arizona takes 553 days (18 months). Such discrepancy can be due to the difference in the courts or in firm characteristics such as sizes and financial structure.

In addition, we also examine the length of bankruptcy procedure for firms that initially filed under Chapter 11 and later transferred into and closed under Chapter 7. We calculate the length of the period between the filing and the conversion (under Chapter 11) and between the conversion and the closure (under Chapter 7). Our results in Table 5 show that these firms spend an average of 4 months in Chapter 11 before conversion and then another 18 months in Chapter 7. The median total length of these case filings is 22 months, very close to the 23 months that average Chapter 7 cases spend. This again indicates that Chapter 7 does not particularly expedite the bankruptcy procedure.

We next try to understand why bankruptcy procedures, regardless of cash auction or negotiation procedure, takes much longer than other countries such as Sweden. We

first focus on Chapter 11. The entire Chapter 11 procedure can be divided into three separate sub-periods. The first period is between the case filing and submission of plan of reorganization. Chapter 11 can be classified as both voluntary (bankruptcy petition filed by the debtors) and involuntary (bankruptcy petition filed by the creditors). Most cases in our sample are voluntary bankruptcy. In the petition, the debtors briefly describe their business outlook and financial situations. The debtors will then collect more information, such as balance sheet and financial statements, for filing schedules about their financial status and affairs.

After financial schedules are filed, the debtor files a reorganization plan (the plan, hereafter) to determine the new financial structure of the firm. The debtor has to file the plan of reorganization within 120 days after it filed for bankruptcy. This period can be and usually is extended upon the debtor' requests. The debtor usually has the exclusive right to file the plan. Creditors, however, can motion to file the Plan themselves. If the debtor no longer has exclusive right to file the plan, all creditors can file the plan. The activities in the first period in some sense reflects how complicated the cases are and how cooperative debtor-in-possession is in facilitating the bankruptcy procedure.

The second period is the time between submission of the plan and confirmation of the plan. In reorganizing the firm, all stakeholders are classified into different classes, such as secured creditors, priority unsecured creditors, non-priority unsecured creditors, and equity holders. It is common that some classes do not receive what they used to hold before the firm enters Chapter 11 in the plan. Such classes are regarded as impaired and allowed to vote for the plan. Majority has to be reached in both the number of the creditors and the amount owned to all creditors before the court can confirm a plan.

The length of the second period can be considered as a proxy for the difficulty in the bargaining process. Because the plan has to be confirmed by all classes with majority rule, the length of this period in part reflects how difficult it is to satisfy the conditions of all parties. Although the court can use "cram down" to pass the plan and save time, the court in our sample has seldom used it.[11] Equity holders are most likely to exploit their bargaining power and protract the bankruptcy process during this period.

After the plan is confirmed, professionals such as lawyers and auditors apply for and are granted compensation for their services in the bankruptcy procedure. Now that all classes of stakeholders have approved the plan, the tension between different classes of stakeholders is greatly alleviated. The managers of the debtor then set out to implement the confirmed plan. We argue that the length of the third period is primarily influenced by the scale of the case instead of the manager's incentive. Large cases usually involve more stakeholders and complicated financial structure, which can prolong the process of distributing the assets. There is also potentially greater opposition during the process of plan implementation if there are more stakeholders or complicated financial structure.[12] Although debtor management may still have incentive to slow down the process, they should be more cooperative with the new creditors and equity holders than in the previous two periods so as to retain their management job. Therefore, the length of the last period should mostly reflect how complicated the cases are instead of how efficient the procedure is.

Table 6 reports that firms in Chapter 11 spend similar amount time in each of the three stages. The composition of time spent in Chapter 11 is quite different for Arizona

and New York cases. Table 7 reports that the first period takes the most time (39.4 percent) for New York cases but the least time (27.4 percent) for Arizona cases. This seems reasonable because New York cases are larger and can take longer to gather the necessary information. On the other hand, period 2 takes the least time (27.0 percent) for New York cases and the longest (41.9 percent) for Arizona cases. It is possible that unsecured creditor committee (the committee) can expedite the process. Although it is common in New York cases, the committee exists in few of Arizona cases. New York firms spend most time on implementing the plan, indicating that the cases are rather complicated. Part of the reason why Chapter 11 cases take long is that Chapter 11 cases are larger and it is time consuming to gather necessary information and implement the plan. Therefore, one has to be careful drawing inference by comparing the time in negotiation system with the time spent in cash auction system.

Given the smaller size of firms Chapter 7 cases, it is surprising that it takes about two years to go through the bankruptcy procedure. Agency problem should not be responsible for the lengthiness because Chapter 7 cases are conducted by elected trustees, who should perform the procedure in a fair and efficient way for creditors.[13] One potential reason is that the amount of claims involved in Chapter 7 cases is smaller and creditors    may    be    less    motivated    than    those    in    Chapter    11.

*3.3. Factors Influencing Chapter 11 Bankruptcy Costs*

In this section, we try to understand what influences bankruptcy costs. Previous studies (Gertner and Scharfstein, 1991) argue that the tension between shareholders and creditors and that between senior and junior creditors can make Chapter 11 cases more expensive and longer to finish. We take advantage of the cross-sectional difference in bankruptcy costs and regress bankruptcy costs on several firm characteristics to understand what influence the bankruptcy costs. These characteristics include total pre-bankruptcy asset, debt to asset ratio, the number of secured and unsecured investors, management equity holding, and whether banks are secured and unsecured creditors.

Larger firms often involve higher bankruptcy costs. However, because bankruptcy costs do not increase in proportion to the firm size, we expect the relative direct bankruptcy costs (the ratio of direct bankruptcy costs to pre-bankruptcy book assets) to decrease with respect to pre-bankruptcy assets.

Most firms in bankruptcy have more debt than assets (the median debt to asset ratio is 1.28) The greater the debt-to-asset ratio, the less likely creditors will recover their claims. Therefore, we expect creditors to be less motivated and incur less bankruptcy costs with high debt-to-asset ratio. We use the logarithm of both total book assets and the debt-to-asset ratio because both measures are strongly positively skewed.

Bris and Welch (2002) argue that not only the structure of the liabilities matters, so does the structure of the creditors. The concentration of creditors influences bankruptcy outcome and bankruptcy costs because lower concentration of creditors call for higher coordination costs among creditors. Such coordination can incur greater bankruptcy costs. In addition, management equity holding is also important because

previous studies (Betker 1995) have found that management, especially when they are equity holders, prolong the bankruptcy process and incur greater bankruptcy costs to bargain for beneficial post-bankruptcy arrangement. Following this line of argument, we expect bankruptcy costs to increase with management equity holding. Finally, we include two dummy variables of whether banks are secured or unsecured creditors in each case. According to Welch (1998) and Rajan and Winton (1995), banks usually have superior information and stronger bargaining power. We will therefore test empirically whether banks being creditors can influence bankruptcy costs.

Results in Table 8 confirm several of our expectations. Pre-bankruptcy assets have negative impact on the relative bankruptcy costs[14] As argued previously, this is primarily because the larger size in denominator renders the ratio smaller.[15] Debt to asset ratio has positive influence on direct bankruptcy costs, indicating that more distressed firms on average call for higher bankruptcy costs. Different from our expectation, higher level of debt seems to indeed induce more costly negotiation among stake holders and incur higher bankruptcy costs. There is weak evidence that management equity holding is positively related to direct costs, consistent with findings in Betker (1995) that management equity holding can lead to deviation from efficient reorganization. The number of secured and unsecured investors does not influence bankruptcy costs, nor does it matter whether banks are secured or unsecured creditors.

Table 9 reports the relationship between the time that firms spend in bankruptcy and above firm characteristics. Similar to the findings on direct bankruptcy costs, pre-bankruptcy assets has positive impact on the length of bankruptcy cases. Interestingly, the

coefficient of management holding is positive and highly significant. Although there is only weak evidence on direct costs, management equity holding can significantly prolong the bankruptcy process. This evidence is consistent with the argument by Baird (1992) that Chapter 11 can create "hold-out" problem if management/equity holders procrastinate the process in order to bargain for favorable reorganization plan. This can lead to prolonged bankruptcy procedure and deviation from efficiency.

Our analysis on above factors' impact on the length of different sub-periods generates consistent results. The length of the first and the second period is positively related to management equity holding. As we discussed before, managers with greater equity holdings are motivated to exploit their bargaining power before the plan is confirmed. As a result, the coefficient for management equity holding is highly significant for the first two periods. Meanwhile, the impact of pre-bankruptcy assets is insignificant during these periods. In contrast, the length of the third period is influenced only by the pre-bankruptcy assets but not management equity holding. Because managers are more cooperative after plan confirmation, the length of the last period is mostly influenced by the complexity of the cases. This offers additional support to our previous argument that, Chapter 11 cases generally take long partly because they are larger and more complicated. In sum, we find that firm size, debt to asset ratio, and management equity holding significantly influences bankruptcy costs.

## 4. Firms' Choice of between Chapter 11 and Chapter 7

One concern about the co-existence of several bankruptcy chapters is that it offers debtors or their managers opportunities to self select into favorable bankruptcy chapters. According to Baird (1992) and Gertner and Scharfstein (1991), such choices can have ex-ante implication on firms' capital structure and the efficiency of different bankruptcy procedures. Therefore, it is interesting to examine what influences firms' decision of entering different bankruptcy procedures and to what extent the agency problem is responsible for the inefficiency of Chapter 11 procedures.

For this purpose, we focus only on all firm bankruptcy filings in Chapter 7 and Chapter 11. Particularly, we perform logit regression of bankruptcy filing/closure chapter on some firm characteristics discussed in Section 3. Consistent with common belief, we find in Table 10 that firm size and financial structure have unambiguous impact on the choice between Chapter 7 and Chapter 11. Firms with greater pre-bankruptcy assets and in greater financial distress are far more likely to enter Chapter 11.

One implication of existing theory is that managers may choose to enter Chapter 11 to exploit their bargaining power and control of the bankrupt firms. If managers are also equity holders, the incentive to enter Chapter 11 and bargain can be even stronger. To test this hypothesis, we also include management equity holding in the regression. However, we did not find support for this hypothesis: the coefficient of management equity holding is negative and insignificant. One possible explanation is that managers derive most of their benefits from controlling the bankrupt firms and equity holding has only marginal influence on their decisions. Another possibility is that there are several potential ways that claimholders can force a quicker reorganization (such as request for

"cram-down", challenge of debtor's exclusive right of filing the plan, and change of management). Such potential deterrence make Chapter 11 less attractive to managers and prevent managers from using Chapter 11 to considerably complicate the reorganization.

We next examine how firm characteristics influence firms' tendency to transfer cases from Chapter 11 to Chapter 7. Transferring a case into Chapter 7 can put the debtor under a trustee's management and therefore avoid unnecessarily prolonging the case. Meanwhile, managers will lose the control over debtors and therefore may have incentive to keep the cases under Chapter 11. Our results on case transferal mirrored the results on case filings. Large firms and firms with high debt to asset ratio are more likely to remain in Chapter 11. However, we find no evidence that management equity holding influences firms' transferal decision either. For most firms transferring to Chapter 7, there is very limited remaining asset to be distributed. This can potentially explain why equity ownership does not have significantly influence managers' decisions.

## 5. Conclusions

In the current study, we offer large sample evidence on bankruptcy costs for more than 800 U.S. Chapter 7 and Chapter 11 bankruptcy filings during late 1990s. The particular data allow us to examine the bankruptcy costs of a comprehensive set of bankruptcy cases by including public and private firms of different sizes. Doing so avoids selection bias that draws inference primarily from large public company bankruptcy. Different from previous belief, we find that cash auction (Chapter 7) procedure is not particularly economical or time saving compared to Chapter 11 procedure. This result is robust for a controlled sub-sample of similar firms in both chapters.

Chapter 11 cases take long to finish partly because firms in Chapter 11 are larger and financially more complicated. Firms with greater assets, greater financial distress, and higher management equity holding tend to take longer and cost more to go through bankruptcy. Firms with less pre-bankruptcy assets and deeper in financial distress are more likely to choose Chapter 7 cases, even though doing so does not guarantee lower direct or indirect costs.

These findings offer important policy implication for evaluating the efficiency of negotiation (Chapter 11) and cash auction (Chapter 7) bankruptcy procedures. Our results indicate that bankruptcy costs may not reliably evaluate these two bankruptcy procedures. Other considerations, such as debt recovery, firm survival, and distribution among claimholders should be given more emphasis.

It is surprising that Chapter 7 cases take similarly time to finish and cost almost the same fraction of pre-bankruptcy assets as Chapter 11 cases do. Given that the direct and indirect costs of Chapter 7 cases considerably exceed those of cash auction procedure in other countries such as Sweden (Thorburn 2000), further studies are called for to understand why cash auction procedure is more expensive in the U.S. and what can be done to make it less costly. Answers to such questions will improve the overall efficiency of U.S. bankruptcy procedures.

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## Footnotes

[1] 38.85 percent of cases at Arizona court and 39.67 percent cases at New York court are filed by firms with less than 1 million of pre-bankruptcy book assets.

[2] 95.14 percent in Arizona court and 91.74 percent in New York court.

[3] Even within U.S., we find bankruptcy costs vary greatly between New York court and Arizona court. The bankruptcy costs are much larger in New York court, partly because cases in New York are bigger and more complicated.

[4] Bankruptcy filing information can be obtained on world wide web at http://pacer.psc.uscourts.gov

[5] Managers hold more than 50 percent of bankrupt firms' equities in more than 20 percent of all cases.

[6] We search for public company report at http://www.hoovers.com for public company report and find 17 matched cases.

[7] The direct bankruptcy costs for Chapter 7 are also positively skewed. The mean direct bankruptcy costs for the whole sample, Arizona cases and New York cases are $9,731.63, $2,992.37, and $12,604.68.

[8] Slightly different in Arizona and New York Court, the compensation is usually a fixed amount plus some additional amount depending on the asset size of the case.

[9] We also tried to match firm by size. However, this approach generates very limited sample of observations.

[10] Altman (1984) manage to estimate potential lost earnings as indirect bankruptcy costs. Senbet and Seward (1995) argue that this measure may be biased and reflect indirect liquidation costs. Earnings data is available only in a small number of sample cases.

[11] Some studies show that stakeholders start negotiating about the plan of reorganization even before the Chapter 11 is filed. Such information is generally unavailable and not considered in this study.

[12] Sometimes, stakeholders file opposition to the way that the Plan is implemented.

[13] It is stipulated that interested party cannot serve as a trustee.

[14] We also regress the total bankruptcy costs on the same set of variables and obtain materially similar results. The coefficient for "ln(asset)" is positive and significant under that specification.

[15] We also regressed the total pre-bankruptcy assets on pre-bankruptcy assets and the coefficient is positive and highly significant.

**Table 1. Summary Statistics**

There are a total of 265 Chapter 11 cases, 144 in Arizona and 121 in Southern New York Bankruptcy Court. There are a total of 675 Chapter 7 cases, 171 in Arizona court and 504 in New York court. There are 134 Chapter 7 cases filed by firms and the remaining 541 cases are personal bankruptcy cases. Total assets and total liabilities are pre-bankruptcy book assets and liabilities. Debt-to-asset ratio is the total pre-bankruptcy book liabilities divided by the total pre-bankruptcy book assets. Secured debt/ liabilities is the total secured liabilities divided by the total pre-bankruptcy book liabilities. Median is provided in parentheses.

| | Firms in Chapter 11 | | | Firms in Chapter 7 | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | Whole sample | Arizona | New York | Whole sample | Firm Filings | Arizona | New York |
| Observations | 265 | 144 | 121 | 675 | 134 | 171 | 504 |
| Total Assets | 1,800,075 ($977,796) | 1,763,652 ($805,783) | 1,894,592 ($1,345,372) | $187,312 ($78,255) | $420,752 ($103,408) | $134,656 ($71,418) | $236,924 ($90,000) |
| Total Liabilities | 2,700,000 ($1,541,668) | 1,700,145 ($1,051,835) | 3,644,016 ($2,320,000) | $353,294 ($113,420) | $589,583 ($225,290) | $149,575 ($98,396) | $529,922 ($152,452) |
| Debt-to-Assets Ratio | 9.74 (1.28) | 6.30 (1.07) | 12.81 (1.55) | 8.24 (1.65) | 6.52 (1.69) | 7.84 (1.66) | 8.63 (1.58) |
| Secured debt / Liabilities | 0.57 (0.46) | 0.51 (0.49) | 0.62 (0.42) | 0.37 (0.31) | 2.91 (0.32) | 0.26 (0.25) | 0.38 (0.31) |

**Table 2. Direct Bankruptcy Costs**

There are a total of 183 Chapter 11 cases with complete balance sheet information. 72 cases were filed in Arizona court and 111 were filed in New York Bankruptcy court. There are a total of 542 Chapter 7 cases with complete balance sheet information. 162 were filed in Arizona court and 380 were filed in New York Bankruptcy court. Direct bankruptcy costs are the sum of the compensation to lawyers, trustees, accountants, and other professionals such as auctioneers and evaluators.

**Panel 1: Chapter 11**

|  | Whole sample | Arizona | New York |
|---|---|---|---|
| Observations | 183 | 72 | 111 |
| Mean | $316,714 | $170,190 | $411,756 |
| Median | $63,867 | $20,634 | $101,901 |
| Std. Deviation | $927,853 | $792,681 | $997,839 |
| Min | $1,830 | $1,830 | $7,107 |
| Max | $7,529,173 | $6,643,640 | $7,529,173 |
|  |  |  |  |
| Fraction of total assets (Median) | 0.033 | 0.022 | 0.067 |
| Fraction of total assets (Mean) | 0.32 | 0.097 | 0.34 |
| Std Deviation | 1.21 | 0.33 | 1.17 |

**Panel 2: Chapter 7**

|  | Whole sample | Arizona | New York |
|---|---|---|---|
| Observations | 542 | 162 | 380 |
| Mean | $9,731 | $2,992 | $12,604 |
| Median | $1,854 | $1,212 | $2,500 |
| Std. Deviation | $38,489 | $9,206 | $45,288 |
| Min | $100 | $250 | $100 |
| Max | $622,774 | $90,672 | $622,774 |
|  |  |  |  |
| Fraction of total assets (Median) | 0.034 | 0.025 | 0.042 |
| Fraction of total assets (Mean) | 0.25 | 0.22 | 0.28 |
| Std Deviation | 1.01 | 1.19 | 0.78 |

**Table 3. Bankruptcy Costs for Sub-Sample of Firms**

The sub-sample firms in this table include all firms with pre-bankruptcy assets greater than $100,000 and smaller than $1,000,000 in both Chapter 7 and Chapter 11. There are 101 Chapter 7 cases in the sub-sample, 51 in Arizona Court and 50 in Southern New York Court. There are 74 Chapter 11 cases in the sub-sample, 28 in Arizona Court and 46 in Southern New York Court. In Panel 1, total assets and total liabilities are pre-bankruptcy book assets and liabilities. In Panel 2, direct bankruptcy costs are the sum of the compensation to lawyers, trustees, accountants, and other professionals such as auctioneers and evaluators. In Panel 3, the time spent in bankruptcy is defined as the number of calendar days between case filings and case closures. Mean is provided in parenthesis.

**Panel 1: Median Firm Characteristics**

|  | **Chapter 11** | **Chapter 7** | **Difference** |
|---|---|---|---|
| Observations | 74 | 101 | |
| Total Assets | $375,503 | $153,930 | $221,573*** |
| (Mean) | ($445,610) | ($187,064) | ($258,546)** |
| Total Liabilities | $621,484 | $178,816 | $442,668*** |
| (Mean) | ($2,661,010) | ($467,738) | (2,194,272)*** |
| Debt-to-Assets Ratio | 1.62 | 1.16 | 0.46** |
|  | (1.24) | (2.30) | (-1.06)** |
| Secured debt / Liabilities | 0.48 | 0.83 | -0.35** |
|  | (1.27) | (0.79) | 0.48** |

** and *** indicate significant at 1 percent and 5 percent, respectively

**Panel 2: Direct Bankruptcy Costs**

| | Chapter 11 | Chapter 7 | Difference |
|---|---|---|---|
| Observations | 74 | 101 | |
| Mean | $99,067 | $27,309 | $71,758*** |
| Median | $32,371 | $16,439 | $15,932*** |
| Std. Deviation | $173,860 | $5762.84 | |
| Min | $1830 | $508 | |
| Max | $773,404 | $55,770 | |
| | | | |
| Fraction of total assets (Median) | 0.087 | 0.11 | -0.018 |
| Fraction of total assets (Mean) | 0.36 | 0.15 | 0.21** |
| Std Deviation | 0.92 | 0.026 | |

** and *** indicate significant at 1 percent and 5 percent, respectively


**Panel 3: Time Spent in Bankruptcy**

| | Chapter 11 | Chapter 7 | Difference |
|---|---|---|---|
| Observations | 74 | 105 | |
| Mean | 698.84 | 577.37 | 121.47** |
| Median | 638.00 | 577.00 | 61* |
| Std. Deviation | 393.68 | 256.14 | |
| Min | 132 | 120 | |
| Max | 2,57 | 1,186 | |

* and ** indicates significant at 1 percent and 5 percent, respectively.

**Table 4. The Time Spent in Bankruptcy**

There are a total of 196 Chapter 11 cases with information on the time spent in bankruptcy. 76 cases were filed in Arizona court and 120 were filed in New York court. There are a total of 674 Chapter 7 cases with information on the time spent in bankruptcy. 171 were filed in Arizona and 502 were filed in Southern New York bankruptcy court. The time spent in bankruptcy is defined as the number of calendar days between case filings and case closures.

| **Panel A: Chapter 11** | | | |
|---|---|---|---|
| | Whole sample | Arizona | New York |
| Observations | 196 | 76 | 120 |
| Mean | 783.06 | 638.97 | 874.31 |
| Median | 696 | 646 | 766 |
| Standard Deviation | 436.39 | 264.36 | 496.36 |
| Min | 17 | 17 | 56 |
| Max | 2215 | 1282 | 2215 |
| **Panel B: Chapter 7** | | | |
| | Whole sample | Arizona | New York |
| Observations | 675 | 171 | 504 |
| Mean | 699 | 534 | 758 |
| Median | 6934 | 553 | 764 |
| Standard Deviation | 354.60 | 283.36 | 357.29 |
| Min | 74 | 120 | 74 |
| Max | 1662 | 1303 | 1662 |

**Table 5. The Time Spent in Chapter 7 Cases**

The second column includes the sub-sample of Chapter 7 cases filed by individual debtors. The third column includes the sub-sample of Chapter 7 cases filed by firm debtors. The third column includes the sub-sample of Chapter 7 cases originally filed under Chapter 11 and later transferred into Chapter 7. The last column includes the same firms as in column 3 and reports the time that the firms spend in Chapter 7 cases only. The time spent in bankruptcy is defined as the number of calendar days between case filings and case closures.

| Time in Chapter 11 | | | | |
|---|---|---|---|---|
| | Personal Debtor | Firm Debtor | Converted Cases (Total) | Converted Cases (In Chapter 7) |
| Observations | 491 | 134 | 44 | 44 |
| Mean | 696 | 708 | 735 | 598 |
| Median | 699 | 672 | 686 | 543 |
| Std. Deviation | 356 | 353 | 339 | 355 |
| Min | 90 | 74 | 143 | 134 |
| Max | 1662 | 1558 | 1547 | 1547 |

**Table 6. The Time that Firms Spend in Different Stages of Chapter 11 Cases**

There are three separate stages within Chapter 11 cases. The first stage is the period between bankruptcy filing and the submission of the reorganization plan. The second stage is the period between plan submission and plan approval. The length of each period is measured in the number of days spent in each period. The third stage is the period between plan approval and case closure. The time that firms spend within each stage is defined as the number of calendar days that firms spend within each stage.

| Panel A: File to Submit Plan | | | |
|---|---|---|---|
| | Whole sample | New York | Arizona |
| Observations | 156 | 82 | 74 |
| Mean | 252.33 | 311.04 | 187.28 |
| Median | 187.5 | 238.5 | 163.5 |
| Std. Deviation | 225.79 | 277 | 126.12 |
| Min | 1 | 1 | 4 |
| Max | 1,329 | 1,329 | 538 |
| **Panel B:  Plan submission to plan confirmation** | | | |
| | Whole sample | New York | Arizona |
| Observations | 146 | 84 | 61 |
| Mean | 223.82 | 197.49 | 260.10 |
| Median | 153 | 120 | 207.00 |
| Std. Deviation | 205.03 | 195.23 | 214.15 |
| Min | 12 | 12 | 29 |
| Max | 1,101 | 1,022 | 1,101 |
| **Panel C:  Plan confirmation to file closure** | | | |
| | Whole sample | New York | Arizona |
| Observations | 133 | 91 | 42 |
| Mean | 254.24 | 241.69 | 281.42 |
| Median | 186 | 173 | 206.50 |
| Std. Deviation | 205.00 | 204.37 | 206.18 |
| Min | 15 | 17 | 15 |
| Max | 1,022 | 794 | 1,022 |

**Table 7. Fraction of time that firms spend in sub-periods of Chapter 11**

Period 1 is the period between bankruptcy filing and the submission of the plan of reorganization. Period 2 is the period between the submission of the plan of reorganization and the confirmation of the plan of reorganization. Period 3 is the period between confirmation of the plan of reorganization and the file closure. The fraction of time that firms spend in each stage is calculated as the number of calendar days that a firm spend within each stage divided by the total number of calendar days that a firm spends in the Chapter 11 procedure. The number of observations is reported in parentheses.

| **Panel A: Mean** | | | |
| --- | --- | --- | --- |
| | Whole sample | New York | Arizona |
| Period 1 | 34.7 | 0.39 | 0.27 |
| | (133) | (82) | (51) |
| Period 2 | 32.1 | 0.27 | 0.42 |
| | (128) | (84) | (44) |
| Period 3 | 36.52 | 0.34 | 0.43 |
| | (133) | (91) | (42) |
| **Panel B: Median** | | | |
| | Whole sample | New York | Arizona |
| Period 1 | 29.74 | 0.37 | 0.23 |
| | (133) | (82) | (51) |
| Period 2 | 26.07 | 0.23 | 0.41 |
| | (128) | (84) | (44) |
| Period 3 | 33.39 | 0.27 | 0.41 |
| | (133) | (91) | (42) |

**Table 8. Factors Influencing Direct Bankruptcy Costs of Chapter 11 Cases**

The dependent variable is the ratio of the total direct bankruptcy costs to the total pre-bankruptcy book assets. Ln(Assets) is the logarithm of the total pre-bankruptcy book assets. Ln(Debt to Asset) is the logarithm of the ratio of total pre-bankruptcy liabilities to pre-bankruptcy assets. Number of Secured Creditors is the number of secured investor in each case and Number of unsecured creditor is the number of unsecured investor in each case. Mgmt. Equity Holding is the percentage of equities owned by firm management. Bank junior is a dummy variable equaling to 1 if banks are junior creditors and 0 otherwise. Bank senior is a dummy variable equaling to 1 if banks are senior creditors and 0 otherwise. T-statistics are provided in parentheses.

| | Total Direct Bankruptcy Costs/Total Pre-Filing Assets | | |
|---|---|---|---|
| Intercept | 2.062** | 2.771** | 2.988** |
| Ln (Assets) | -0.143 | -0.201 | -0.215 |
| | (-3.271)*** | (-3.446)*** | (-3.079)*** |
| Ln (Debt to Asset) | 0.262 | 0.212 | 0.213 |
| | (4.410)*** | (2.913)*** | (2.504)** |
| Ln (length of filings) | 0.0312 | 0.0715 | 0.0699 |
| | (0.206) | (0.408) | (0.366) |
| Number of Secured Creditors | | -0.0000755 | 0.0483 |
| | | (-0.344) | (1.090) |
| Number of unsecured creditors | | 0.000303 | 0.000204 |
| | | (1.060) | (0.609) |
| Management Equity Holding (%) | | 0.004* | 0.00457 |
| | | (1.694) | (1.597) |
| Bank Junior | | | -0.0160 |
| | | | (-0.471) |
| Bank Senior | | | -0.0740 |
| | | | (-0.277) |
| Adjusted R-Square | 0.48 | 0.49 | 0.51 |
| Number of Observations | 158 | 129 | 124 |

**Table 9. Factors Influencing Indirect Chapter 11 Bankruptcy Costs**

There are a total of 150 observations. In Panel A, the dependent variable is the length (logarithm of the number of days) between bankruptcy filing and bankruptcy closure. In Panel B, the dependent variables in column 2, 3, 4 are the period between case filing and plan submission, between plan submission and plan approval, and between plan approval and case closure, respectively. Ln(Assets) is the algorithm of the total pre-bankruptcy assets. Ln(Debt to Asset) is the logarithm of the ratio of total pre-bankruptcy liabilities to pre-bankruptcy assets. Number of Secured Creditors is the number of secured investor in each case and Number of unsecured creditor is the number of unsecured investor in each case. Mgmt. Equity Holding is the percentage of equities owned by firm management. Bank junior is a dummy variable equaling to 1 if banks are junior creditors and 0 otherwise. Bank senior is a dummy variable equaling to 1 if banks are senior creditors and 0 otherwise. T-statistics are provided in parentheses.

**Panel A: Total Length in Chapter 11**

| | Ln (Length Between Filing and Closure) | | |
|---|---|---|---|
| Intercept | 5.808 | 5.178 | 5.240 |
| Ln (Assets) | 0.0501 | 0.0736 | 0.0724 |
| | (2.517)** | (2.822)*** | (2.497)** |
| Ln (Debt to Asset) | -0.000998 | 0.00129 | 0.00150 |
| | (-1.515) | (0.812) | (0.859) |
| Number of Sec. Creditors | | -0.0000451 | -0.00242 |
| | | (-0.404) | (-1.112) |
| Num. Of un-secured creditors | | 0.000138 | 0.000201 |
| | | (0.975) | (1.247) |
| Mgmt. Equity Holding % | | 0.00451 | 0.00428 |
| | | (3.907)*** | (3.323)*** |
| Bank Junior | | | 0.0652 |
| | | | (0.426) |
| Bank Senior | | | 0.0234 |
| | | | (0.186) |
| Adjusted R-Square | 0.041 | 0.10 | 0.071 |

**Panel B: The Length of Three Sub-Periods in Chapter 11**

| | Ln(Period 1) | Ln (Period 2) | Ln (Period 3) |
|---|---|---|---|
| Intercept | 0.649 | 4.166 | 3.985 |
| Ln (Assets) | 0.0545 | 0.05049 | 0.07665 |
| | (1.149) | (0.605) | (1.661)* |
| Debt to Asset Ratio | 0.06095 | -0.00151 | 0.000009591 |
| | (1.197) | (-0.119) | (0.001) |
| Number of Secured Creditors | 0.01903 | 0.0001045 | 0.01112 |
| | (0.545) | (0.002) | (0.282) |
| Num. Of un-secured creditors | -0.000208 | 0.0002269 | -0.000166 |
| | (-0.118) | (0.558) | (-0.600) |
| Mgmt. Equity Holding % | 0.01310 | 0.007516 | -0.00168 |
| | (3.555)*** | (2.164)** | (-0.675) |
| Bank Junior | -0.250 | -0.00421 | 0.0007453 |
| | (-0.479) | (-0.10) | (0.002) |
| Bank Senior | -0.402 | -0.127 | 0.371 |
| | (-1.123) | (-0.378) | (1.554) |
| Adjusted R-Square | 0.163 | 0.015 | 0.016 |

**Table 10. Firms' choices of entering Chapter 11 and Chapter 7 cases**

We perform logit regression in both Column 2 and Column 3. For the second column, the dependent variable equals 1 if a case if filed under Chapter 11 and 0 if filed under Chapter 7. For the third column, the sample only included those cases filed under Chapter 11. The dependent variable equals 1 if a case is closed under Chapter 11 and 0 if closed under Chapter 7. Ln(Assets) is the algorithm of the total pre-bankruptcy assets. Debt to Asset Ratio is the ratio of total pre-bankruptcy liabilities to pre-bankruptcy assets. Bank Sec. is dummy variable equal to 1 if bank is secured creditor and 0 otherwise. Bank Unsec. is dummy variable equal to 1 if bank is unsecured creditor and 0 otherwise. Mgmt. Equity Holding is the percentage of equities owned by firm management. Standard deviations are provided in parentheses. T-statistics are provided in parentheses.

| | Choice of Filing Chapter 11 | Choice of Transferring from Chapter 11 to Chapter 7 |
|---|---|---|
| Intercept | -6.0052 | -7.3849 |
| Ln (Assets) | 0.6564 | 0.7694 |
| | (0.1745)*** | (0.2022)*** |
| Ln (Debt to Asset) | 0.2892 | 0.3334 |
| | (0.1705)* | (0.1844)* |
| Bank Sec. | -0.0566 | -0.7836 |
| | (0.0961) | (0.5724) |
| Bank Unsec. | -0.3104 | 0.4674 |
| | (0.6441) | (0.8416) |
| Mgmt. Equity Holding (%) | -0.5792 | -0.5820 |
| | (0.6702) | (0.6914) |
| Pseudo R-Square | 0.199 | 0.236 |
| Number of observations | 210 | 185 |