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The Changing Nature of Chapter 11

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The Changing Nature of Chapter 11

Abstract

The U.S. Chapter 11 bankruptcy has traditionally been viewed as equity friendly, with frequent absolute priority deviations (APDs) in favor of equity. By contrast, based on a more recent sample we find that both APDs and time spent in bankruptcy have declined dramatically. We hypothesize and confirm that innovations in the bankruptcy process, such as reliance on debtor-in-possession (DIP) financing and adoptions of key employee retention plans (KERPs) help explain this decline. We conclude that while the letter of bankruptcy law has not changed, Chapter 11 outcomes have become more creditor friendly in recent years.

Keywords: Bankruptcy, APR violations, Chapter 11.

J.E.L. Classification Code: G33, G34, G12.

1 Introduction

Chapter 11 of the 1978 Bankruptcy Act of the United States affords equity holders and company management substantial protection against creditors in the form of an automatic stay. Through this process, creditors will not obtain payments until a reorganization plan is adopted by the company. This provision of the act vests considerable power with the incumbent management. Not only can it exclusively file the reorganization plan in the first 120 days following the bankruptcy petition, it also has the additional benefit of information asymmetry on its side.

To the extent that management favors equity, considerable costs on creditors can be imposed by protracting the reorganization process. Creditors, anticipating the loss in value of their claims due to the delay and in the interest of reaching an agreement, often waive their right to be fully satisfied before distributions are made to equity holders. While the absolute priority rule (APR) denies any claim holder a stake in the securities of the reorganized firm until more senior claims have been fully satisfied, such violations of the APR - so called absolute priority deviations (APD) are not prohibited under the Chapter 11 Bankruptcy code.

Empirically, APD in Chapter 11 reorganizations in the 1980s have been documented to be commonplace by Franks and Torous (1989,1994), Eberhart, Moore and Roenfeldt (1990), Weiss (1990), and Betker (1995). Their results indicate that APR is violated 75% of the time and equity on average receives 7.6% of the reorganized firm's value. These results, among others have led observers to characterize the U.S Bankruptcy system as equity friendly.

However, there have been several innovations related to the bankruptcy reorganization process in recent years starting in the 1990s. The reorganization process has become increasingly professionalized, with legal counsel and consultants actively representing all parties in the reorganization process. A growing number of bankruptcy filings are pre-packaged, or pre-negotiated, which significantly reduces the time in bankruptcy (Betker (1995), Tashjian, Lease, and McConnel (1996)). Moreover, firms in bankruptcy now rely heavily on innovations such as debtor-in-possession (DIP) financing (Dahiya et. al (2003)) and key employee retention plans (KERP) (Crutchley and Yost (2008), Adler, Capkun, and Ors (2009)) that may alter the bargaining power of stakeholders in the

reorganization process. The objective of this paper is to test whether these innovations have significantly affected the outcomes of the Chapter 11 bankruptcy reorganization process. Specifically, we test if these innovations affect the likelihood of a deviation from APR in favor of equity, as well as the payout to equity holders in Chapter 11 bankruptcies.

We first compare the frequency and magnitude of APR violations in bankruptcy reorganizations in recent years (from 1991 to 2005) to the evidence from the 1980s. We rely on a sample of 626 reorganizations over the period 1980-2005 which is by far the most comprehensive sample of large bankruptcies in the literature to date. We find that APR violations occur only 22% of the time in the period 1991-2005, with violations as low as 9% on average for the 2000-2005 period. The average magnitude of the violations has also declined to about 0.44% of the reorganized firm value. In fact, the median reorganized firm in the 1990s and later does not have any APR violation. This secular declining trend in the frequency and magnitude of APR violations is readily discernible in Figure 1A. The frequency of violations has declined from 100% to about 20% and the magnitude of APD has declined from 10% of firm value to less than 2% of firm value.

A natural question to ask is if changes in firm characteristics can explain the secular decline in the frequency and magnitude of APR violations. For example, we find that firms filing for Chapter 11 were significantly more insolvent in the 1990s and 2000s than in the 1980s, which could potentially explain some of the deterioration of equity's bargaining power (Franks and Torous (1994), Adler, Capkun, and Weiss (2006)). We examine this question in the context of a multivariate probit regression where we control for characteristics that have been shown to explain cross-sectional variation in the frequency of APDs in the literature (including insolvency). The regressions show that the predicted probability of a violation is 59.5% in the 1980s. By comparison, the predicted probability of a violation in the 1990s was 18.6 percentage points lower and in the 2000s it was 41.6 percentage points lower, controlling for firm characteristics. We also conduct a GLM regression analysis (Papke and Woolridge (1996)) of the magnitude of APD and find that the magnitude of APD is significantly lower in the 1990s and the 2000s controlling for firm characteristics. These effects are economically large and strongly statistically significant, confirming the results in Figure 1A.

We then turn to exploring if financial innovation such as prepacks, DIP financing, and KERPs can explain the dramatic reduction in APR violations over this time period. Based on univariate analysis, Tashjian et al (1996) find that the percentage APR violations in favor of equity are lower for prepackaged bankruptcies than for comparable traditional Chapter 11 reorganization based on a sample of 38 prepackaged bankruptcies from 1980-1993. However, this conjecture has not been confirmed for a more comprehensive sample of bankruptcies.

To our knowledge, Skeel (2003) is the first scholar to conjecture that contractual innovations in the bankruptcy process such as DIP financing and KERPs have given creditor more bargaining power in the reorganization process. To obtain cash to operate in Chapter 11, companies often arrange for DIP financing. Although DIP financing has been available in theory since the 1978 Bankruptcy Reform Act, it was not until the wave of bankruptcies in the early 1990s that DIP financing grew in size and importance once lenders designed loan contracts that ensured their super priority status under section 364(c) and 364(d) of the Act (Dahiya et al (2003)). DIP lenders (many of whom are existing creditors) determine the direction and outcome of reorganization to a large extent by imposing stringent restrictions for providing financing. These restrictions are directly aimed at influencing the corporate governance of the firm in bankruptcy, and often include specific covenants relating to board seats, asset sales, liquidation and even the transfer of control.

Similarly, executive flight following retail bankruptcies in early 1990s (hitherto not seen in the 1980s bankruptcies) led creditors to propose pay to stay plans for key employees to preserve the value of the business (Dickerson (2003)). Creditor and court-approved KERPs promise key executives bonuses that are often explicitly tied to the speed of the reorganization process, thus counteracting the tendency for managers to draw out Chapter 11 reorganizations. Skeel (2003) argues that these two features act as effective deterrents to APD. Figure 1B shows the dramatic secular increase in the percentage of Chapter 11 cases each year that uses DIP and KERP. This suggestive evidence is consistent with Skeel's (2003) conjecture that the rise of DIP and KERP may be related to the declining APDs in recent years. We emphasize that neither DIP nor KERP explicitly curtail shareholders power to negotiate, or their ability to vote against a reorganization plan. Instead, these innovations represent indirect ways in which the balance of power has pivoted towards creditors over

time.

We formally test Skeel's (2003) conjectures based on our sample of firms by first regressing the proportion of firms that have APD each year against the proportion that use DIP and KERP in that year. Perhaps not surprisingly given Figure 1 (with two opposite time trending variables in DIP, KERP and APD), we find that DIP and KERP are negatively and significantly related to APD, and can explain 83% of the time series variation in APD. In particular, the concern is that spurious regression (Granger and Newbold (1974)) relations may be found between the levels of independent, trending time series. We address this concern in three ways.

First, it must be noted that DIP and KERP are contractual mechanisms that exist only within Chapter 11 and are approved typically at the start of the negotiations between the various stake holders, while APD is the end result of the bankruptcy. More importantly, strong economic arguments suggest how DIP financing imposes stringent restrictions on the firm's operations (thus limiting the power of the management and old equity holders) and how KERP plan bonuses alter incentives of key executives to jettison the old equity holders in order to reorganize faster and claim the financial bonus for their efforts.

Second, we identify two other trends during this period namely the increase in forum shopping (the increasing reliance of Delaware as the choice of bankruptcy filing destination) and the increase in prepackaged bankruptcies over the sample period. These increasing time trends are also very similar to DIP and KERP but with opposite implications for APD. Both forum shopping and prepackaged bankruptcies are expected to increase APDs as debtors choose these outcomes strategically in the chapter 11 process. A four horse race of these trends in the time series regressions confirm the importance of DIP and KERP in explaining APDs (but not forum shopping and prepacks) increasing our confidence in the results.

Third, we use prepack, DIP and KERP dummies along with the bankruptcy venue in the firm level cross sectional probit regressions. We find that the DIP and KERP dummies are negatively and significantly related to the probability of an APD controlling for other firm characteristics. By contrast, prepacks are associated with a significantly higher likelihood of APD controlling for other factors. This evidence also shows that the pattern of declining APD cannot be explained by a rising

frequency of prepacks. The fact that we confirm the results using the cross sectional variation each year among firms that adopt DIP and KERP should also address any spurious regression concerns. The marginal effects from the probit regressions suggest that DIP financing is associated with a 14.6% lower probability of an APD while KERP is associated with a 10.1% lower probability of an APD, all else equal. We note that these results hold even after controlling for the endogeneity of the DIP financing decision. Moreover, both the DIP and KERP dummies are negatively and significantly related to the magnitude of APD in our Generalized Linear Model (GLM) regressions. In sum, it appears that the growing popularity of innovations such as DIP financing and KERPs have contributed significantly to the more creditor-friendly outcomes of the bankruptcy reorganization process in recent years.

We also find other corroborating evidence suggesting that the Chapter 11 bankruptcy reorganization process has become more creditor-friendly. As creditors gain bargaining power and managers tend to be aligned with shareholders, we would expect to see more management firings in recent years. Indeed, we find that management turnover has increased significantly from 22.9% of the cases in the 1980s to 37.7% after 2000, an increase of 65%. We also find that the conditional probability of management turnover when management has significant shareholdings (defined as greater than 5% of the company) has increased significantly from 12% of cases in the 1980s to 38% of the cases in recent years. Thus, creditors have gained sufficient power to even oust entrenched incumbent managers in recent years. Further, in recent years we find that the conditional probability of an APD is 30% when management holds a significant stake in the firm compared to only 19% when management shareholdings were low. By contrast, during the 1980s the probability of an APD did not depend significantly on management shareholdings. Thus, management appears to bargain more aggressively for APR violations in situations when their own financial stakes are high, while otherwise abandoning such efforts in a bid to keep their jobs. Finally, we find that the average time spent in Chapter 11 reorganization declined by about 30% from 22.5 months in the 1980s to 16.2 months in the 2000s, suggesting that the greater reliance on pre-packaged bankruptcies and that the incentives provided by the KERP plans to speed up the reorganization process were effective.

Overall, these developments lead us to conclude that Chapter 11 has increasingly moved from

being an equity friendly system to a process that produces more creditor friendly outcomes over the years. Financial innovations (such as DIP and KERP), has contributed to an increase in creditor control of the Chapter 11 process and firm managers, rationally anticipating reduced bargaining power in the formal Chapter 11 process, delay filing for bankruptcy as long as possible. This implies that the firm is pushed deeper into insolvency, which reduces the moneyness of the option to delay proceeding in Chapter 11 even further. Since APD is the value of this option, reducing moneyness would reduce APD over time. Indeed, as noted above we find that firms filing for Chapter 11 were significantly more insolvent in the 1990s and 2000s than in the 1980s, potentially explaining some of the deterioration of equity's bargaining power leading to reduced APD that we find in the data. The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, passed on October 17, 2005 (the end of our chosen sample period so as to not confound its effects), formalizes our interpretation of the changes by explicitly incorporating "creditor-friendly" provisions, thereby eliminating some of the discretionary aspects of the bankruptcy process. Kalay, Singhal, and Tashjian (2007), report that Chapter 11 sample firms experience significant improvements in operating performance in the 1990s. Similarly, Lemmon, Ma, and Tashjian (2009) find that Chapter 11 preserves the value of financially distressed firms while redeploying the assets of economically distressed firms based on a sample from 1991-2004. Together these papers suggest that the move towards a creditor friendly system the we document in this paper may not have had adverse operational consequences for firms in Chapter 11 in the 1990s and later.

We then turn to some implications of our results. Existing research suggests that ex post deviations of APR can have beneficial ex-ante effects. Benefits include desirable ex-ante investments in firm-specific human capital (Berkovitch and Israel (1998)), facilitation of information transfer to creditors for reorganization (Berkovitch and Israel (1998)), and discouraging excessive risk-taking by financially distressed firms (Gertner and Scharfstein (1991)). Our results indicate that such benefits may have eroded over time. Further, our results have ramifications for the strategic debt service literature's (e.g., Mella-Barral and Perraudin (1997), Sundaresan and Wang (2007)) conjecture notion that the debtors' ability to obtain a payout in violation of APR by threatening to delay the bankruptcy process increases credit spreads, reduces debt capacity, and therefore reduces firm

value. Since we find that APDs have declined sharply over time, the value of the option to delay, and hence the link between the debtors delay tactics and credit spreads, leverage, and firm values, may have to be reexamined.

The remainder of the paper is structured as follows. Section 2 discusses the data. Section 3 describes the trends in Chapter 11 cases over time and the determinants of APD violations identified by existing research. Section 4 presents our methodology and results and discusses the implications of our results. Section 5 concludes.

2 Data and Sample Selection

We attempt to construct the most comprehensive sample of Chapter 11 cases for studying APR violations in bankruptcy in the literature to date. Towards this end, we obtain the cases in 1980s (1979-1990) from three published papers in the literature: (a) Franks and Torous (1989) sample of firms that emerged from bankruptcy¹ (b) Eberhardt, Moore and Roenfeldt (1990) sample of Chapter 11 cases between 1979-1986 and (c) Betker (1995) sample of firms that filed for Chapter 11 between 1982-1990.² After rationalizing the three sources we obtain 95 distinct Chapter 11 cases in the 1980s. As an independent cross check we search the firms in the Bankruptcy Data Source database maintained by New Generation Research. While each of the studies cited above missed some bankruptcies, collectively the literature has identified the entire sample of bankruptcies in the 1980s and our exhaustive search does not add any new cases to the sample of 95 firms. Thus, the secular decline in APD documented in this paper is definitely not due to the earlier literature having missed some Chapter 11 cases in their analysis.

For the period from 1991-2005, we begin with a list of all 602 large public company bankruptcy cases filed in the United States Bankruptcy courts from Lynn Lopucki's Bankruptcy research database. We eliminate 60 finance, insurance and real estate bankruptcy cases leaving us with a

¹We only include those firms that emerged after the enactment of 1979 Bankruptcy Code on October 1, 1979.

²We thank Brian Betker for graciously sharing his data with us and explaining his process of calculating APR violations in Ch.11 cases.

starting sample of 542 cases. We then crosscheck our sample with the list of firms in the Bankruptcy Data Source database maintained by New Generation Research. The database includes all firms with at least one public security and at least \$50 million in assets that filed for Chapter 11. We then search and eliminate eleven cases for which reorganization plans and market value of new stock issued to claim holders is unavailable. These screens leave us with a sample of 531 cases in 1991-2005, thus bringing the total sample size to 626 cases as outlined in Table 1, Panel A.³ Note that this sample has about 9 to 24 times more data than the reported studies in the literature and will help us discern robust trends and changes over a period of 26 years, since the enactment of the Chapter 11 Bankruptcy Code in 1979.⁴

Details on the firm's reorganization plans, including the type and amount of new securities received by each class of claimants, were obtained from the firm's disclosure statements. According to Section 1125(a) of the bankruptcy code, these statements must contain adequate information that would enable a hypothetical reasonable investor to make an informed judgment about the plan. We first verify that the reorganization plan was the last plan approved by the bankruptcy court before emergence, since firms often file multiple amended plans during the Chapter 11 process. We obtain this information from an 8K filing or from plans summarized in the Bankruptcy data source. Additional information such as dates of Chapter 11 filing, plan confirmations, outcomes of Chapter 11 cases were obtained from Bankruptcy data source. If data was unavailable we used Lexis-Nexis and Factiva to search all SEC filings and newspaper articles to ascertain the information. If data was still not available from these news sources, we searched the Dow Jones news retrieval system for information.

Calculation of APR violations in bankruptcy: Following Betker (1995), the value ob-

³We have a few Ch.11 cases in our sample caused by asbestos and silicon implant litigations which are non-financial distress and reorganization involves negotiations with tort claimants. Removing them from our analysis in the paper does not materially alter our conclusions.

⁴It should be noted that Bankruptcy Data Source lists 1903 public company bankruptcy cases, a lot more than the 542 cases in our starting sample for the period 1991-2005. All of these cases are small firms that do not have any reorganization plans, or financial information on securities of the firm, publicly available, a requirement for this study. For a recent study that includes smaller firms, see Bris, Welch, and Zhu (2006)

tained by each claimant class is calculated using security prices that most closely postdate the firm's emergence from bankruptcy. The market value of the new securities is obtained from CRSP tapes, Bankruptcy Datasource and Bloomberg. Only market values are used for preferred stock, common stock and warrants. Market values are used for debt securities where available, otherwise the face value of debt is used. APR violations are calculated following the method in Betker (1995), Eberhart et al. (1990), and Franks and Torous (1994). Equity's APD is defined as the value of new securities received in the reorganization, minus what would have been received if APR was followed. This value is normalized by the value of all securities distributed in the reorganization to obtain a percent figure. As an example, consider the March 2002 reorganization plan of Chiquita International Inc. The value of allowed claims in the plan for debt and of various classes and preferred stock was \$1,002.6 million. Debt and preferred stock holders received a new package of \$250 million of debt (face value), \$26.7 million of cash and \$559.75 million of new equity and warrants (market value). The total market value received by these claim holders was \$836.45 million. The old equity shareholders received \$17.13 million even though under APR they should have received nothing, since the creditor shortfall was \$166.15 million [$\1002.60 (amount owed) - $\$836.45$ (amount received)]. Thus APR is violated in this reorganization, and the magnitude of APD is estimated at 2.01% [$\$17.13$ million / ($\$17.13$ million + $\$836.45$ million), amount paid to equity holders divided by the total value of all securities distributed under the reorganization plan].⁵

Prepackaged and Pre-negotiated Chapter 11 filings: We draw information on pre-packaged and pre-negotiated Chapter 11 filings from Lynn LoPucki's Bankruptcy research database.

Firms that obtained DIP financing in Chapter 11: In order to examine the impact of the development of the DIP financing market on Chapter 11 reorganizations, we need data on the firms that obtained DIP financing. Following Dahiya et. al. (2003), we employ a three step process. First, we use the Dealscan database from Loan Pricing Corporation which contains corporate loans in the U.S. from 1986, and search for loans whose purpose is "Debtor-in-Possession". Second, since

⁵All Chapter 7 liquidations follow the APR rule.

the Dealscan database is not a comprehensive source of all such loans, we supplement our list by searching the Dow Jones News Retrieval system and the Lexis-Nexis business news section for the keywords "Debtor-in-Possession financing", "DIP financing" and "post-petition" financing. Third, we search the SEC filings and reorganization plans at Bankruptcy Datasource for DIP financing cases, partly to confirm the information from the first two steps and partly to find additional cases of DIP financing that are not included in the other databases. In all cases, we verify that the bankruptcy court had approved the DIP financing plan.⁶

KERP plans in Chapter 11: In order to obtain details on KERP plans approved in Chapter 11, we search the SEC filings in Lexis-Nexis using the following keywords: "KERP", "Retention Plan", "bonus plan", "pay-to-stay", "bankruptcy pay", "bankruptcy bonuses", "retention bonus", "management incentive plan", "MIP", "key employee compensation plan", "KECP", "supplemental incentive plan", and "SIP". We then search for the term "bankruptcy court" in all these hits and read them to confirm that the KERP plan was approved by the court. As a final cross check, we confirm that all cases that were covered by this procedure are also found in the Lexis-Nexis and Factiva business news section stories.

3 Trends in Chapter 11 cases over time and determinants of Absolute Priority Deviations

3.1 Development of the Debtor-in-Possession Financing (DIP) market

The Chapter 11 of the 1978 U.S. Bankruptcy code, refers to companies that file for bankruptcy protection as debtor-in-possession (DIP). Section 364 of the Act titled 'Obtaining Credit' is the source of authority for all post-petition credit that constitute DIP financing under Chapter 11. Under Section 364, the courts can treat a DIP loan as an administrative expense, below existing

⁶We found a few post-petition financing arrangements for firms, but could not find any indication of confirmation by the bankruptcy court and hence excluded them from the sample.

secured lenders in hierarchy. Courts can also provide DIP lenders security interest in debtor's unencumbered assets or even a primary lien - a superpriority status over existing security interests on the same collateral.⁷

In one of the first studies of DIP financing in Chapter 11, Dahiya et al (2003) note that even though DIP financing was available under the law since 1978, it did not become prominent until the 1990s. The declining real estate markets and recessionary business environment meant that many banks experienced severe financial difficulties in the mid 1980s. Firms filing for bankruptcy had less cash and liquid assets available than in earlier periods and hence the need for external financing to continue operations in bankruptcy increased. Banks were looking for low-risk, high-yield ventures, and DIP financing was a prime candidate. Chemical Bank led the way when it started its DIP financing unit in 1984. Chemical Bank was the only bank to play a large role in the area of DIP financing until 1988.⁸ The percentage of bankrupt debtors that obtained DIP financing rose from 10.42% in 1989, to 48.21% in 1996, in the Dahiya et al (2003) sample. Daniels and Ramirez (2008) document that the size of the DIP market increased 140-fold from \$0.067 billion in 1989 to \$9.85 billion in 2002. The rapid growth of DIP financing was facilitated by the fact that Fitch started rating DIP loans in 1991. DIP loans were not only perceived to be low-risk, the default rates on DIP loans was extremely low: Fahy (2008) reports that from 1988 to 2008 only two loans (out of 297 DIP rated loans) experienced defaults.

With the increasing importance of DIP financing in Chapter 11, Skeel (2003) notes that DIP lenders have actively used the terms of the loan to assume control and shape the outcome of reorganizations. Specifically, DIP loans typically restrict what management can and cannot do through strict affirmative (financial reporting) and negative (restricting the operations of the firm) covenants. The covenants are designed to reduce the holdout problem, and to avoid situations like the Eastern Airlines case (Weiss and Wruck (1993)).

⁷Skeel (2003) notes the origins of DIP financing in the 19th century equity receiverships of U.S. railroads. Courts promised preferential priority to lenders by the use of receiver's certificates and obtain financing to keep the railroads in operation during the reorganization.

⁸Darla Moore who set up the desk at Chemical Bank once boasted that she has never lost a penny on DIP financing as cited by Hensch (1991).

Moreover, Adler, Capkun and Weiss (2006) argue that a 2000 non-statutory change in the Uniform Commercial Code (UCC) implied an increased use of DIP financing and that this changed the bargaining position of creditors at the expense of the debtors in bankruptcy process.⁹ The change in UCC allowed creditors to write control provisions into the lending agreements that enabled them to take over financial decision making if firms showed signs of distress. As a result, the creditors of firms approaching bankruptcy were able to freeze the bank accounts and trigger loan covenants that took control away from the debtor. Note that this change did not take place until the last five years of our sample. Hence, it is unlikely to explain the increased reliance of firms on DIP financing in the mid 1990s onwards.

The following examples illustrate the importance and power of DIP financiers in shaping reorganizations.

(a) In the U.S.Air bankruptcy reorganization, retirement systems of Alabama, a pension fund, acted as the DIP lender. The lender agreed to provide \$240 million up front, \$300 million during Chapter 11, and \$300 million on emergence. In return, the lender obtained seven out of thirteen board seats, together with 36% of the stock of the reorganized company (Maynard (2002)).

(b) In TWA's last bankruptcy, DIP financing by American Airlines was conditional on the latter's prompt acquisition of TWA's assets (Carey (2001)).

(c) In the FAO Schwarz bankruptcy in 2002, DIP financing covenants explicitly called for a liquidation of debtor's assets unless a plan of reorganization was confirmed by April 4, 2003 (N.Y.Times Feb 1, 2003 article).

(d) In the United Airlines bankruptcy, the DIP lender required that the debtor meet strict cash flow targets to qualify for future financing. Adams (2003) notes that even though the lending agreement did not require United to lay off workers, to cut labor costs was the only way the company could meet its targets.

(e) DIP lenders also dictate the course and outcomes of Chapter 11 cases by their influence over managerial personnel. Baird (2004) describes the influence of banks on the choice of WorldCom's

⁹Specifically, a change in the Uniform Commercial Code (UCC 9-104) was adopted by most states during the 2000-2001 period.

restructuring officer.

The above discussion suggests that the development of DIP financing in the 1990s may have eroded the influence of debtor and its managers over the course of Chapter 11 reorganizations compared to the 1980s. This suggests that we should find a lower incidence of APDs in favor of equity holders, wherever DIP financing is involved.

We investigate the importance of DIP financing in explaining APR violation in two ways. First, we include a dummy variable for the presence of DIP financing in a Chapter 11 reorganization in estimating models of APR violation. Second, and important, we explicitly recognize the possibility that information revealed in the DIP financing decision might be related to APR violation outcomes. Specifically, existing creditors are more likely to provide DIP financing for firms where they are more likely to recover more of their pre-bankruptcy claims in the reorganization plan. Using Maximum likelihood methods (Maddala (1983)), we address this endogeneity issue econometrically. We estimate the DIP financing decision and the APR violations jointly using a bi variate probit model, using the covariates identified by Dahiya et al (2003) as the vector of observables considered important in the DIP decision. For a detailed justification of these variables see Dahiya et. al. (2003). This technique estimates the effect of DIP financing by purging the effect of observable characteristics that lead to higher probability of APR violations and that contribute to the endogenous decision of the firm to obtain DIP financing in the first place.¹⁰

3.2 Development of Key Employee Retention Plans (KERP) in Chapter 11

A KERP is a plan filed by the debtor with the bankruptcy court to provide bonuses to key, high level employees to induce them to stay employed with the bankrupt company, during the reorganization. Skeel (2003) observes that creditors in the 1990s bankruptcies warmed up to this idea after suffering through executive flight in retail and electronics chains Chapter 11 cases. Creditors concluded that

¹⁰We use the exact MLE estimator and not the Heckman (1979) two step procedure, since our APR violation variable is binary rather than continuous and hence the two step procedure produces inconsistent estimates.

providing incentives to existing managers who know the business to stay through Chapter 11 was preferable to the time consuming and disruptive process of getting new managers up to speed, during the reorganization. More often than not, management turnover, if any, occurred towards the end of the Chapter 11 reorganization plan.

A KERP may include many of the following types of payments, each predicated by events in the reorganization process: (1) retention payments to employees of the debtor to stay until a certain date e.g. the filing of a reorganization plan; (2) success bonuses based on events such as confirmation of a reorganization or sale of the business; (3) severance payments; and (4) golden parachutes to eligible employees. Debtors relied on the courts' powers under Section 105(a) to enter orders consistent with their equitable powers as one of the statutory basis for their plan. The other statutory basis was under Section 363(b)(1) that governs the use, sale or lease of property (including cash) outside of the ordinary course of business. Bankruptcy courts typically established a two-pronged test for approving KERPs requiring (a) a sound business purpose to justify the KERP and (b) the KERP be 'fair and reasonable'. Due to the discretionary nature of this test, the courts' decision to approve a KERP is dependent on the particular circumstances of each case. Dickerson (2003) notes that almost half of all debtors in Chapter 11 in the 1990s and later offered some variant of a KERP plan to their employees.¹¹

The following examples outline the role of KERPs in shaping reorganization plans.

(a) WorldCom obtained court approval to use up to \$25 million for bonuses to 329 key employees. The KERP also included plan progress bonuses at 10% of the initial retention bonus. Key employees were entitled to 100% of the progress bonus, if a reorganization plan was confirmed in December 2003, 150% for November 2003, 200% for October 2003 and 250% for a September 2003 confirmation; clearly incentivizing management for faster resolution of Chapter 11. (Blumenstein

¹¹It is interesting to note that there is an enactment of the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCA) by Congress applicable to Chapter 11 cases filed after October 17, 2005 (the end of our sample period). BAPCA section 503(c) imposes explicit and stringent restrictions on the adoption of KERPs for the benefit of insiders of the bankrupt company. The oversight hearings on April 17, 2007 by the Subcommittee on Commercial and Administrative Law (of the U.S. House of Representatives) also examines the issue of executive compensation in Chapter 11 cases, presumably as a response to complaints of routine approval of KERPs in bankruptcy cases.

(2002), Blumenstein and Wei (2002) and court motion dated Oct 18, 2002).

(b) Kmart used over \$3 million in inducement payments and incentives to top executives (Schwartz et al (2002)). Kmart also filed for a \$4 million bonus for its new CEO, if Chapter 11 reorganization was completed by July 2003 with a penalty of \$7,299 per extra day delay thereafter, with the bonus set to zero if Kmart did not emerge by April 30, 2004. (Yue (2002))

The discussion indicates that the practice of the bankruptcy process provides explicit incentives to management for speedy resolution of Chapter 11 cases in the 1990s. This would work to counter the agenda of management to drag out Chapter 11 cases to extract concessions from the creditors. Other things being equal, the presence of court approved KERPs would serve to expedite Chapter 11 reorganizations. Equity holders dilatory option whose value is measured by the magnitude of APR violations would be eroded and we would expect to see fewer incidence of APR violation in Chapter 11 cases with KERPs. We include a dummy variable for the presence of KERPs in estimating models of APR violation frequency and magnitude.

3.3 Additional determinants of Absolute Priority Deviations to equity in Chapter 11

In addition to the development of prepackaged bankruptcies, the DIP financing market and the KERP programs as possible drivers of lower APR violations, we review the determinants of APR violations identified by the prior literature and include them as additional control variables in our tests.

Complexity of bargaining in Chapter 11: According to Betker (1995), APR violations are larger for bigger firms. Equity's bargaining position is stronger with multiple creditor classes making it difficult to form workable coalitions. We proxy for the complexity of the Chapter 11 case by firm size (measured as $\log(\text{assets})$). As a robustness check, we also use the number of creditor classes in the reorganization plan following Betker (1995).

Equity committee: Equity holders can affect Chapter 11 reorganizations by forming an equity committee, under section 1102 of the bankruptcy code. The bankruptcy judge has the right (but not the obligation) to appoint such a committee, which suggests a cohesive group of equity holders can band together and extract APR violations (Lopucki and Whitford (1993)). We use a dummy variable that equals one if an equity committee was approved by the bankruptcy judge in chapter 11, and zero otherwise.

Venue of the bankruptcy case: Betker (1995) observes that judges in the southern district of New York are viewed as pro shareholder and that APR is violated more often in that court district. In fact, New York even changed its judge assignment system in 1988 based on such complaints. That same year, a Delaware judge ruled that a company's residence or domicile is its place of incorporation for the purposes of Chapter 11 reorganization. Delaware was well-known for efficient and fast judicial processing of bankruptcy filings (Eisberg and Lopucki (1999)) and bankruptcy filings were rapidly diverted to Delaware. By the mid-1990s, more than 80% of firms chose Delaware as the filing state while in the 1980s, Delaware had zero cases (Eisenberg and Lopucki (1999)). We control for venue of the case in our empirical model of APR violations following Betker (1995), using a dummy variable for cases filed in the southern district of New York.

Management incentives in bankruptcy: Section 1107 of the bankruptcy code provides that a debtor in possession shall perform all duties of a trustee serving under this chapter. This indicates that management owes a fiduciary duty to both shareholders and creditors. The formation of equity committees under Chapter 11 also indicates that management and shareholders may not always have aligned interests. Further, the management team has to worry about keeping its jobs, as Gilson (1989) shows that they are sometimes replaced at the behest of creditors. By siding with creditors and jettisoning shareholders, management can hope to preserve their jobs, if creditors call the shots.

However, if the management holds a substantial equity stake in the bankrupt firm at the onset of Chapter 11, it has a strong incentive to bargain for a distribution to equity. Thus equity

holders strong bargaining position is a byproduct of management incentives. One indication of an increasingly creditor friendly Chapter 11 regime would be the presence of APR violations when management has substantial share holdings but not otherwise. In the case of an equity friendly Chapter 11 regime, one would expect to observe APR violation, regardless of the level of management share holdings in the bankrupt firm.

Management's exclusivity to propose a reorganization plan: The debtor-in-possession and its management have the exclusive right to propose a plan of reorganization within 120 days of entering Chapter 11, though extensions are frequently granted. This right confers on the management the ability to delay reorganizations and enhance the probability of APR violations. Thus a loss of exclusivity suggests a strong bargaining position of creditor groups, as noted by Betker (1995).

Management turnover: According to Gilson (1989, 1990), management changes in Chapter 11 are often initiated by creditors, mainly banks. Creditor initiated management changes are likely to lead to new management that is creditor friendly, thus diminishing equity holders' bargaining power, producing smaller APR violations. Hotchkiss (1995) suggests that Chapter 11 produces bias toward continuation of unprofitable firms, especially with the old management in place, supporting the above arguments. Jensen (1991) further states that priority violations are virtually guaranteed when the courts allow the current management team to remain in place. We examine the impact of management turnover in our tests since increasing creditor control in the Chapter 11 process should manifest in greater management turnover rates over time.

The option to delay: According to Franks and Torous (1989), APD in favor of equity reflect the purchase by creditors of the shareholders' option to delay reorganization, in Chapter 11. The option to delay reorganization is an American style call option created by the Chapter 11 code. The time value of this option forfeited by shareholders, in addition to a premium reflecting the future legal and administrative costs saved by creditors is captured by the magnitude of APR violations, due to creditors writing down their claims.

Franks and Torous (1994), observe that the time value of the option to delay is larger the closer the face value of creditors' claims (D) is to the value of the firm at reorganization (V). Hence creditors are expected to offer equity holders more when the option to delay is closer to or at the money. We measure the moneyness of the equity holders option by $\ln(D/V)$ and $(\ln(D/V))^2$ following Franks and Torous (1994).¹² Following the evidence in Tashjian, Lease and McConnell (1996) we also include a dummy variable for pre packaged bankruptcies.

4 Methodology and Results

We begin by examining the characteristics of Chapter 11 filings from 1979 to 2005 and establish the result of declining APR violations and APD using regression analysis. We then examine the development of DIP and KERP in Chapter 11 and its impact on APR violations to assess if the evidence is consistent with the thesis that that creditors have gained bargaining power in Chapter 11 bankruptcies over the years.

4.1 Descriptive Statistics

Table 1 Panel B, compares the incidence of APR violations in the 1991 to 2005 to existing results in the literature. Franks and Torous (1989), Weiss (1990), Eberhart, Moore, Roenfeldt (1990) and Betker (1995) find APR violation frequencies between 72% and 77.8% on the sample of firms before 1990. In sharp contrast, using a much larger sample of firms in the 1991 to 2005 period, we find the violation frequency to be just 22.0% or only in 117 out of 531 cases. The yearly distribution of Chapter 11 filing dates in Table 1 Panel C suggests a relatively even distribution of firms till 1998, which increases markedly in 1999 to 2003, a period marked by the high profile bankruptcies of Enron and WorldCom.

¹²For many Chapter 11 cases that eventually lead to liquidations, we are unable to calculate (D/V) due to lack of plan information, even though we know that APR is preserved and equity receives nothing. Thus, we use this variable mainly as a robustness check in our analysis.

Since the 1990s also saw the emergence and fall of the new economy and Internet firms, we ask if the industry composition of Chapter 11 firms changed over time. Table 1 Panel D, shows the industry-wide distribution of sample firms in the pre-1990, 1991-1999 and 2000-2005 time periods. The composition is fairly similar across time with two notable exceptions: (a) Telecom bankruptcies formed 18.4% of the sample in 2000-2005, up from 0% before 1990 and (b) Oil and gas bankruptcies declined from 12.8% of the sample before 1990, to 1.3% in 2000-2005. A Kolmogorov-Smirnov tests of equality of distributions cannot reject the null hypothesis that the industry composition in the 1980's is no different from the 1990's and 2000's time periods. Figure 2 plots the proportion of firms that violate APR in each industry over the three time periods. We find the pattern of declining APR violations to be robust and present in virtually every industry in our sample. These results suggest that industry composition trends are unlikely to be the explanation for the overall decline in APR over time.

In Table 1 Panel E, we assign sample firms to four categories based on the outcome of Chapter 11. A firm is reorganized if it emerged from Chapter 11 as an independent entity, liquidated if the filing was converted to Chapter 7 or if the firm's assets were sold to multiple buyers, acquired/merged if the firm was acquired by or merged with another firm and undetermined if we are unable to obtain information. Panel E, shows that about 60% of the firms reorganized, 19% liquidated and 11% are acquired/merged and 10% have undetermined outcomes. Panel E also presents statistics on the time spent in Chapter 11, measured as the number of months between the filing date and confirmation date of the plan. The average (median) number of months spent in Chapter 11 is 18.02 (14.88) months. Average time spent in bankruptcy for different outcomes range from a low of 15.86 months for reorganization to a high of 23.25 months for liquidation.

4.1.1 Magnitude of Absolute Priority Deviations (APD) over time

Table 2 Panel A, presents the distribution of APD as a percentage of firm value, where firm value is measured at emergence from bankruptcy for the three time period. We find equity's deviation was zero in 35.9% of the cases before 1990. This number increases to 73.6% in 1991-1999 and to 91.3% in 2000-2005. Fully 9 out of 10 cases post-2000 did not violate the APR rule, signaling a major shift

in Chapter 11 processes years between the 1980s and 2000-2005. We also find from the table that firms with sizeable equity deviations also declined dramatically between the 1980s and 2000-2005. Panel B, shows that mean deviation was 3.55% of firm value (\$59.78 million) before 1990, declining to 0.63% (\$2.89 million) in 1991-1999 and further to 0.44% (\$3.28 million) in 2000-2005. Each time period witnessed spectacular deviations (in \$ amounts): Texaco (1987,\$6100 million), Columbia Gas Systems (1991, \$226.7 million) and Amerco (2003, \$476.67 million).

We formally examine for differences across the 3 periods by a Kolmogorov-Smirnov test for equality of APD distributions. In each of the 3 comparisons ('80s versus '90s, '80s versus '00s and '90s versus '00s) we are able to reject the null of equality of distributions of APD with p values less than 0.1%. The Wilcoxon test of the equality of the medians across the three subperiods is also rejected at significance levels less than 1%.¹³Note, however, that the largest change in terms of economic magnitude is clearly between the 1980s and the later periods.

Table 2 Panel C presents the proportion of firms with APD as a function of firm size measured as the value of assets in year 2000 constant millions of dollars. The data shows that while APD was common across all size classes before 1990, a disproportionate number of the violations post-2000 happen in the 1 billion to 2 billion dollar dollar bankruptcies in the 1990s and the 10 billion dollar and above bankruptcies in the 2000s.

4.1.2 Analysis of frequency and magnitude of APD violations over time.

Table 3, Panel A presents the data corresponding to Figure 1, discussed earlier in the paper. We find a steady decline in both the frequency and magnitude of APD over the twenty six years of our sample. Table 3 Panel B, documents the number and proportion of Chapter 11 cases each year that had DIP financing or a KERP approved by the bankruptcy court. The data corresponds to Figure 1, Panel B. DIP and KERP, virtually non-existent in cases before 1990 have steadily increased over the years with about 2/3rds of the cases having these mechanisms by the end of the sample period. As discussed in the introduction, although DIP financing has been available in

¹³The t-test for the means is also significant at 1%, in two of the three comparisons of the subperiods, with the '90s not different from the '00s period.

theory since the 1978 Bankruptcy Reform Act, it was not until the wave of bankruptcies in the early 1990s that DIP financing grew in size and importance once lenders designed loan contracts that ensured their super priority status under section 364(c) and 364(d) of the act (Dahiya et al (2003)).¹⁴ Similarly, executive flight following retail bankruptcies in early 1990s (hitherto not seen in the 1980s bankruptcies) led creditors to propose pay to stay plans for key employees to preserve the value of the business (Dickerson (2003)). Our perspective is thus to view both DIP and KERP as contractual financial innovations that made their appearance in the 1990s and examine their impact on the reorganization outcomes such as absolute priority deviations.

Perhaps not surprisingly given Figure 1 with two opposite time trending variables in DIP / KERP & APD, one has to establish the relationship between DIP/ KERP and APD with some measure of confidence. In particular, the concern is that spurious regression (Granger and Newbold (1974)) relations may be found between the levels of independent, trending time series. Further, Figure 1 suggests that APD had started declining in the 1980s much before DIP and KERP took off. By 1990s APD has become economically small and thus one needs to examine if there was a third driver came into existence before DIP and KERP gained any prominence and before the decline in APDs. We address these issues next.

In Table 3, Panel C, we assess the importance of these mechanisms on the outcome of APD in Chapter 11 as follows. In Specification 1, we regress the proportion of firms with APD each year against a time trend - as expected, the trend variable is negative and significant at 1% level, explaining 88% of the time series variation. In Specification 2, we replace the trend variable with the proportion of firms each year that had DIP or KERP. Our first argument against spurious correlation as noted in the introduction is an economic one. DIP and KERP are contractual arrangements that are possible only in the event of a bankruptcy of a firm and never otherwise. The upward trend in mechanisms such as DIP and KERP which are creditor friendly are naturally expected to result in the downward trend of the share of the firm gained by equity holders in Chapter 11 reorganization of the firm, in violation of the absolute priority rule (i.e. APD in favor of equity). In short, creditors

¹⁴A few DIP financings were made in the mid-1980s, but the first DIP loan recorded in the DealScan database was extended in 1988.

gain at the expense of the equity holders, since they become more powerful in the negotiation process, aided by the mechanisms of DIP and KERP. The results show that both DIP and KERP are negative and statistically significant as hypothesized and are able to explain 83% of the variation in APD violations. Specifications 3 and 4 explicitly recognize the fact that our dependent variable is a proportion between 0 and 1 and apply the GLM fractional response methodology of Papke and Woolridge (1996). Our inferences are qualitatively unchanged.

Figure 1 certainly suggests most of the action seems to be in the 1980s before the advent of DIP and KERP. To illustrate that DIP and KERP are indeed important factors explaining the evolution of APDs, we first re-run the time series regression excluding the 1980s in specification 5. We find that DIP and KERP have a strong explanatory power for the decline in APD even excluding the 1980s. This result shows that the increased incidence of DIP and KERP can explain declining APDs, even though Figure 1 visually seems to suggest that all the action was in the 1980s. We also show that this result is economically significant. A one standard deviation increase in DIP reduces the frequency of cases that have an APD by 10 percentage points. Compared to the data that indicates that on average 26% of cases in the 1990s and 2000s had an APD, we note the DIP effect is 38% of the time series mean, which is economically large and very significant. Similarly, a one standard deviation increase in KERP reduces the frequency of cases that have an APD by 8 percentage points. Compared to the data that indicates that on average 26% of cases in the 1990s and 2000s had an APD, we note the KERP effect is 31% of the time series mean, which is economically large and very significant. These economic magnitudes are virtually identical to specification 2, which includes data from the 1980s as well. Thus, we conclude that DIP and KERP had economically large effects on APD even excluding the 1980s.

We also search for related statute changes in the bankruptcy law that could have impacted APD by strengthening creditors unrelated to DIP and KERP that could drive our findings. The Bankruptcy Amendments and Federal Judgeship Act was passed in 1984 to clarify jurisdictional reach of bankruptcy courts as well as to bring clarity in the interpretation of key provisions concerning confirmation of a reorganization plan (related to Section 1129 of the Bankruptcy Code).

The intent behind these amendments was to "extend more protection to creditors".¹⁵ According to Simpson (1986), "The Amendments reflect a congressional intent to afford a greater protection to creditors. Recent case law appears to be cognizant of that intent. Whether this reciprocation of intent is one of deference to Congress or one of a general change in the political and judicial climate is only speculative. Perhaps the provisions in Section 1129(b), which protect dissenting classes, evidence a trend." In addition, the 1984 Amendments Act provided courts with the power to reduce the debtors 120-day exclusivity period or the 180-day acceptance period (and any further time extensions) for cause upon request of a party in interest. Though it wasn't a common occurrence, some courts such as the Third Circuit in its 1988 decision on *First American Bank of New York v. Century Glove* allowed for multiple plans "on the table" during the exclusivity period further jeopardizing the role of the debtor.¹⁶ Our results are robust to including a dummy variable that takes on a value of one for the post 1984 period and zero otherwise, capturing the weakening of the 120 day exclusivity period and the amendments as seen in specification 6 of Table 3, panel C. The results above show that there was indeed a structural shift, with lower APDs after 1984. However, the incidence of DIP and KERP remain significant factors in explaining the fraction of bankruptcy reorganizations that result in pay outs to equity.

Perhaps, the most convincing test would be to search for structural changes and other financial innovations that happened in the 1980s and trended upwards (similar to DIP and KERP) but had opposite predictions on APD. A horse race of DIP and KERP against these alternate changes in explaining APDs, would be informative on the trends that affected APDs. The first of these structural changes was the increasing preference for Delaware over New York as the choice for bankruptcy filing destination. In 1988, a Delaware judge ruled that a company's residence or domicile is its place of incorporation for the purposes of Chapter 11 reorganization. This made Delaware attractive for firms to "forum shop" and file Chapter 11. By mid 1990s, more than 80% of firms chose Delaware as its destination while in the 1980s Delaware had zero cases.¹⁷ In terms of cases in Delaware, Continental Airlines and United Merchants in 1990 were considered landmark cases

¹⁵See Simpson(1986)

¹⁶See Nelan (1989)

¹⁷See Eisenberg and Lopucki, 1999, p.984.

that were done in Delaware. One would expect forum shopping to result in higher APDs. Another innovation in the 1980s that took hold in the 1990s was that of prepackaged bankruptcies. A prepack is a plan for financial reorganization that a company prepares in cooperation with its creditors that will take effect once the company enters bankruptcy. This plan must be voted on by shareholders before the company files its petition for bankruptcy, and can result in shorter turnaround times. Consistent with this observation, the mean time to termination of Chapter 11 cases has been monotonically declining since the 1980s as noted in Figure 3 from Eisenberg and Lopucki (1999). One can thus expect higher APD as the "price of peace" that creditors must negotiate in order to have a quick plan confirmation. Thus we have identified an innovation that trended upwards during the sample period with an opposite prediction on APD.

An augmented regression with two other additional trends (Forum Shopping and Prepacks) both of which predict an increase in APD is presented specification 7 and 8 (which excludes the 1980s) in Table 3, Panel C. Given that forum shopping debtors chose to file in Delaware, it is reasonable to expect forum shopping to result in higher APDs. This is contrary to what we see in our data. The coefficient on forum shopping is of the wrong sign and is insignificant once we exclude the 1980s. A possible explanation for this result is that firms elect to file in Delaware to avoid long resolution times in for example NY as argued by Eisenberg and Lopucki (1999). If so, the expected positive relationship between forum shopping and APD may be attenuated.

Similarly, while prepacks have the right sign (positive) as expected, it does not have a significant effect on APD outcomes once DIP and KERP are controlled for. This increases the confidence in our results since we have identified two opposing time trends (DIP, KERP vs. Forum Shopping, Prepacks) with opposite anticipated effects based on economic reasoning on APD. The fact that DIP and KERP win out in this four horse race on APD seems to suggest that the trend we have identified is not spurious.

4.1.3 Other variables to explain APD violations.

Table 4 reports summary statistics for the variables identified by prior literature to explain priority deviations. Following Franks and Torous (1994), we measure solvency by the ratio of face value of

debt (D) to firm value (V). If D/V exceeds 1.0, there is not enough value to pay creditors in full and equity is out of the money. We find a dramatic increase in insolvency of firms filing for Chapter 11. The mean solvency ratio increased from 2.714 before 1990 to 5.377 in 1990-1999 to 9.333 in 2000-2005.

Using insights from option pricing, one can understand the secular decline in APD over time. APDs in favor of equity arise when creditors write down their claims in exchange for equity holders relinquishing their option to delay the reorganization. The value of the option to delay arises from the ability to threaten to enter Chapter 11 or as in our sample, once in Chapter 11, the ability to delay the firm's emergence from reorganization. We expect APDs to be larger the more valuable is the option to delay. The reason is that the threat of either a bankruptcy filing or a protracted bankruptcy proceeding tends to reduce creditors recovery rates. In other words, the option to delay increases the bargaining power of the debtor. Franks and Torous (1994) show that the time value of the option to delay is larger the closer the face value of creditors claims (D) is to the value of the firm at reorganization (V). Hence we expect creditors to offer equity holders more when the option to delay is closer to or at-the-money (i.e.) when firms are more solvent and their D/V ratio is close to one.

In Figure 3, we illustrate this point by plotting percentage equity deviations against $\ln(D/V)$, a measure of solvency of the firm. We confirm earlier research which found that the option is at-the-money in the 1980s, which is consistent with substantial APDs. By contrast, the option is either deep in-the-money or deep out-of-the money as in the 1990s and thereafter. In this situation, theory predicts that we should see lower APDs. Indeed, that is also what we find in the data in the 1990s and 2000s. We argue later in the paper that this observation is the logical outcome of increasing creditor control in the Chapter 11 process.

Two other points stand out in the summary statistics of Table 4: (a) The rate of formation of equity committee declined by about 200% (from 29.17% before 1990 to 9.25% in 2000-2005) and (b) Management turnover in bankruptcy increased by about 65% (from 22.92% before 1990 to 37.67% in 200-2005). All these results collectively indicate the declining influence of shareholders and management in Chapter 11 reorganizations over time. Further, management appears to hold

similar amount of shares during the entire sample period.

4.1.4 Multivariate analysis of APR violations over time

We estimate a probit model for the probability of APR violations, where the dependent variable takes the value one for a violation in a Chapter 11 case and zero otherwise. The previous literature has documented that APR violations in the cross-section can be explained by a number of firm characteristics as discussed in Section 3.3. It is possible that a secular trend in these firm characteristics can explain the decline in APR violations observed in Figure 1. To rule this out, we control for the known determinants of APR violation reported in the literature and then add two dummy variables, one each for the cases filed in the 1991-1999 and 2000-2005 periods. Our goal is to assess if there is a robust secular decline in APR violations (by the statistical significance of these dummy variables) that is not subsumed by the known determinants.

We also wish to estimate an econometric model for the percentage APD (as a proportion of firm value) to assess the time series impact on the magnitude. However percentage APD is a fractional response variable bounded between zero and one. Further, a large mass of the data assumes extreme values (zero percent APD in our application). Thus assuming a distribution such as a beta distribution for y given x to estimate $E(y|x)$, our object of interest would not work since there is a distributional failure as the beta distribution implies each value in $[0,1]$ is taken on with probability zero. Papke and Woolridge (1996) solve this econometric problem by specifying a logistic functional form for $E(y|x)$ and estimate the parameters using Bernoulli quasi-likelihood methods. Note that a logistic regression would model the log odds ratio as a linear function (i.e.) $E(\log(\frac{y}{1-y}|x)) = x\beta$ and not model $E(y|x)$. The above equation cannot be true if y takes the value zero with positive probability as in our case. The Papke and Woolridge(1996) method is briefly described below.

Consider an independent sequence of observations $[(x_i, y_i) : i = 1, 2, \dots, N]$ where $0 \leq y_i \leq 1$ and N is the sample size. The assumption is that for all i , $E(y_i|x_i) = G(x_i\beta)$, where $G(z)$ is a known function satisfying $0 < G(z) < 1$ for all $z \in \Re$ (In estimation, the logistic function, $\frac{\exp(z)}{\exp(z)+1}$ is used). Papke and Woolridge (1996) propose a quasi maximum likelihood to maximize the Bernoulli

log-likelihood function given by

$$l_i(b) \equiv y_i \log(G(x_i\beta)) + (1 - y_i) \log(1 - G(x_i\beta))$$

Gourieroux, Monfort and Trognon (1984) show that the QMLE of β obtained from the maximization problem $\max \sum_{i=1}^N l_i(b)$ is consistent for β , provided the conditional expectation assumption holds. Papke and Woolridge (1996) apply this Generalized Linear Model (GLM) estimation technique for 401(k) plan participation rates, where the dependent variable is a proportion between zero and one. Our case is similar in that APR is also a proportion between zero and one, with zero being a point at which observations cluster.

4.1.5 Results of the multivariate analysis

Table 5 Panel A, presents the results of the probit estimation. Specification 1, with just the time dummy variables generates pseudo-R squared of 15% with both the 1991-1999 and 2000-2005 dummies strongly negative and significant at the 1% level. The economic effects are rather large. The probability of APR violations declined by 21.59% in the 1991-1999 period from a level of 64.10% in the 1980s. The decline of 46.76% is even more dramatic for the 2000-2005 period. Specification 2 confirms these results even in the presence of other covariates from the existing literature. Specification 2 also shows that prepacks and equity committees lead to higher likelihood of APR violations as expected. Note also that for bankruptcies with large managerial holdings are associated with higher APR violations, which is consistent with the theoretical predictions in Gennaioli and Rossi (2010).¹⁸ Specifications 3 through 6 add additional covariates for which the data is not available for all firms (loss of exclusivity, creditor classes, management turnover and solvency) to the specification 2, and we find that the time dummies continue to be negative and significant. We also recover the Franks and Torous (1994) result that deeply insolvent firms have a lower likelihood of APR violations.

¹⁸Gennaioli and Rossi (2010) predict that the extent of managerial rents should correlate positively with the extent of pro-credit outcomes in the cross-section. We thank the referee for pointing this out.

Table 5 Panel B, repeats the specifications from Table 5 Panel A but with the dependent variable being the magnitude of APD, following the GLM methodology of Papke and Woolridge (1996).¹⁹ We find similar results on the time dummies. Overall we conclude that both the frequency and the magnitude of APD have declined over time based on these estimations in Panel A and Panel B.

4.1.6 Increasing importance of DIP financing and KERP plans in Chapter 11

Having established the declining frequency and magnitude of APD over time in Chapter 11 we turn to some explanations of the results. We suggest that existing or new creditors of the firm now have the ability to shape reorganizations actively by the twin mechanisms of DIP and KERP. We assess the evidence both at the macro (marketwide) and the micro (firmwide) levels on the importance of these mechanisms in curbing APD, thus making the Chapter 11 outcomes increasingly favor creditors over the years.

Firm wide evidence

In Table 6 Panel A, we estimate the probit and GLM models of probability and magnitude of APD adding dummy variables for DIP and KERP for each case. We remove the time dummy variables, since we wish to assess the significance of DIP and KERP (which have a strong time trend) but more importantly have an economic interpretation, in explaining APD outcomes. All other covariates correspond to specification 2 in Table 5 Panel A. We find that the coefficients on DIP and KERP are negative and strongly statistically significant in the probit regression suggesting that the probability of APD is strongly influenced by the presence of DIP and KERP. The economic significance is also large: the presence of DIP lowers the likelihood of APD by 15% to 19%; the presence of a KERP lowers the likelihood of APD by 10% to 13%. The GLM regressions on the magnitude of APD indicates that only KERP is reliably negatively related. The presence of DIP seems to lower the likelihood of APD, but conditional on an APD, does not affect its magnitude.

In Table 6 Panel B, we explicitly recognize the endogeneity of DIP financing and using the covariates suggested as important for the DIP decision by Dahiya et al (2003), estimate a bivariate

¹⁹Since additional covariates such as loss of exclusivity, creditor classes and management turnover were not significant in Panel A, we did not estimate those specifications in Panel B.

probit model with the probability of obtaining DIP financing and the probability of APD being the two outcome variables. We identify the system using Dahiya et al's (2003) observation that retail firm bankruptcies are more likely to secure DIP financing. We find that both the coefficient estimate (economic significance) and the statistical significance of the DIP variable has increased controlling for endogeneity issues. Collectively the firm level evidence indicates the importance of creditor friendly mechanisms such as DIP and KERP in shaping Chapter 11 APD outcomes.

4.1.7 Additional evidence on the increasing creditor friendly nature of Chapter 11 outcomes.

In this section, we develop additional evidence on the changes in Chapter 11 APD outcomes. While each piece of evidence by itself is not the definitive one, collectively these results paint a Chapter 11 system that increasingly favors creditors.

In Table 7 Panel A, we conduct 2-way chi-squared test of independence between managerial shareholdings and managerial turnover. We hypothesize that significant managerial shareholdings in the bankrupt firm (defined as $\geq 5\%$) entrench management making them difficult to dislodge. In the pre-1991 period, the conditional probability of management turnover for entrenched managers was only 12% compared to the non-entrenched manager's turnover rate of 47%, the difference being statistically significant at a p-value of 0.008. In sharp contrast, in the post-1991 period the conditional probability of management turnover for entrenched and non-entrenched managers were 38% and 36% respectively, the differences being statistically insignificant. These results indicate that the ability of entrenched managers to hold on to their jobs were considerably weakened post 1991, consistent with their decreasing influence on Chapter 11 proceedings accompanied by the increasing influence of creditors.

We also conduct a second chi-squared test of entrenched managers' ability to extract equity deviations (in line with their self interest). In the pre-1991 period, there was no significant difference between the ability of entrenched and non-entrenched managers to extract APD for equity. The corresponding conditional probabilities of an APD were 60% and 67% respectively, with the difference statistically insignificant. This suggests that Chapter 11 afforded enough latitude even for

non-entrenched management to extract concessions for equity holders. However, in the post-1991 period the conditional probabilities of APD for entrenched and non-entrenched managers were 26% and 17% respectively. The reduced magnitudes are consistent with the declining frequency of APD; the difference between the two groups is statistically significant at a p-value of 0.014. This result indicates that management bargains more actively for APD when their personal share holdings are significant but otherwise aligns with interest (presumably creditors) that do not favor APD, in a bid to keep their jobs (since our earlier results indicate the increased threat of management turnover in Chapter 11 in the post-1991 period).

According to the bankruptcy code, debtors' managers are the only ones who could propose a reorganization plan for at least the first 120 days of the case. They also controlled the operation of the company and had the right to propose extraordinary transactions such as asset sales. Thus managers could use this leeway to drag out the case and/or to extract concessions from creditors. Thus decreasing times to resolution of Chapter 11 cases could be one more indication of increased creditor control or at the least the waning influence of management's dilatory tactics on the process.

Table 7 Panel B shows the distribution of time spent in Chapter 11 for our sample of firms in the three time periods. The mean time spent in Chapter 11 has declined by about 30% from 22.5 months pre-1991 to 16.2 months in the 2000-2005 period. The median time has also declined by about 30% from 19.5 to 13.5 months. In table 8 Panel C, we regress the log of the number of months spent in Chapter 11 on a set of covariates. From Specification 1, as expected, we find that larger bankruptcies take longer to resolve, and that prepacks are considerably shorter. Controlling for observables we still find that Chapter 11 cases resolve faster, both in the 1991-99 and 2000-05 periods, consistent with the univariate evidence. In Specification 2, we examine the impact of DIP and KERP on the time spent in Chapter 11. Ex-ante the effects are unclear : On the one hand, increased creditor control and incentives of these mechanisms serve to expedite Chapter 11. At the same time, one needs consensus among creditors and the approval of the bankruptcy court for installing these mechanisms which would delay the Chapter 11 process. Specification 2 suggests that the net effect of the presence of DIP and KERP is to increase the time spent in Chapter 11, but the coefficients are small and statistically insignificant. We conclude that DIP financing and

KERP do not seem to lengthen the negotiation process in Chapter 11.

Perhaps, the most convincing of the evidence is to plot equity's deviations (representing the value of the dilatory option in Chapter 11) against $\ln(D/V)$, which represents its moneyness, following Franks and Torous (1994). Fig 3 shows that the option was deep out-of-the-money for many more firms filing after 1990 compared to firms filing before 1990. Consequently, APD violations representing the value of this option is close to zero. This indicates that management might rationally anticipate increased creditor control in Chapter 11 and hence delay filing as long as possible, thus eroding the value of the option, consistent with the observations of Adler et. al.(2006). We offer this as an important supporting piece of evidence consistent with our thesis that Chapter 11 outcomes have become more creditor friendly over the years. The argument is as follows : Financial innovations (such as DIP and KERP), limitations on exclusivity, changes in 1984 and 1988 in the practice of bankruptcy law (as seen from point 1) have all contributed to an increase in creditor control of the Chapter 11 process. Firm managers, rationally anticipating reduced bargaining power in the formal Chapter 11 process, delay filing for bankruptcy as long as possible. This implies that the firm is pushed deeper into insolvency, which reduces the moneyness of the option to delay proceeding in Chapter 11 even further. Since APD is the value of this option, reducing moneyness would reduce APD over time, which is found in the data.

Thus, we argue that firms entering Chapter 11 are more insolvent precisely because they anticipate the increased creditor control of the Chapter 11 process and that diminished APDs are the result. Interestingly, Adler, Capkun and Weiss (2006) document a similar deterioration of financial conditions of firms filing for bankruptcy around 2000. They argue that a non-statutory change in the Uniform Commercial Code (UCC) implied an increased use of DIP financing and that this changed the bargaining position of creditors at the expense of the debtors in bankruptcy process. Specifically, a change in the Uniform Commercial Code (UCC 9-104) was adopted by most states during the 2000-2001 period. The change in UCC allowed creditors to write control provisions into the lending agreements that enabled them to take over financial decision making if firms showed signs of distress. As a result, the creditors of firms approaching bankruptcy were able to freeze the bank accounts and trigger loan covenants that took control away from the debtor. Note that this

change did not take place until the last five years of our sample. Hence, it is unlikely to explain the increased reliance of firms on DIP financing in the mid 1990s onwards. Nor can it be expected to be able explain the significant reduction in APDs in the 1990s.

4.2 Implications of the Results

Bulow and Shoven (1978) and White (1983) were the first papers to show that APR generally leads to inefficient investment and liquidation/continuation decisions. In particular APR leads to an under investment problem in the sense of Myers (1977) where the benefits of investments accrue only to debt holders. Berkovitch and Israel (1998) analyze this problem in more detail and show that APR violations allow the firm to efficiently renegotiate its debt, eliminating perverse ex-post investment incentives. Along a similar vein, there exists a body of research that argues that ex-post deviations of APR are beneficial for ex-ante effects. These include desirable ex-ante investments in firm specific human capital (Berkovitch, Israel and Zender, 1997) and discourage excessive risk taking by financially distressed firms (Gertner and Scharfstein (1991) and Eberhart and Senbet (1993)). Our results on declining APR violations suggests that these ex-ante beneficial effects of chapter 11 have eroded through time.

At the same time, costs of APR violations include negative ex-ante effects identified by Bebchuk (2002) which exacerbates the moral hazard problem with respect to the project choice of equity holders favoring risky projects, distribution of dividends and taking of extra debt. Weiss and Wruck (1998) show that a judge's biases about the distressed firm's prospects by favoring equity holders at the expense of creditors can be extremely costly by analyzing the case of Eastern airlines. Our results show that these costs of APR violations have also eroded over time. Thus any analysis of the current state of costs versus benefits of Chapter 11, will be affected by our results.

Chang and Schoar (2007) further analyze the effect of judicial bias (pro equity or pro creditor) on Chapter 11 outcomes for a sample of small firms. Establishing the fact that cases are assigned randomly to judges, they document systematic differences across them in granting or denying certain motions. If such a pattern of random assignments of cases to judges holds for the large firms that form our sample, it would be interesting to examine the effect of changes in judicial bias and link

it to the increasingly creditor friendly outcomes that we observe over time in our sample.

Yield spreads on corporate bonds tend to be many times wider than what would be implied by expected default losses alone and are the difference between yields on corporate debt subject to default risk and government bonds free of such risk. For example, the average spread on BBB-rated corporate bonds with three to five years to maturity was about 170 basis points and yet the average yearly loss from default amounted to only 20 basis points (Amato and Remolona (2003)). The spread was more than eight times the expected loss from default and this wide gap between spreads and expected default losses is termed the credit spread puzzle. A large literature following Anderson, Sundaresan, and Tychon (1996) model the strategic debt servicing possibilities that arise in the presence of liquidation costs. Using a noncooperative game-theoretic formulation, they conclude that the possibility of strategic debt service results in deviations from absolute priority and significantly increases the spread between risky and riskless bonds even at moderate volatility and debt levels. Fan and Sundaresan (1999) explore alternative bargaining formulations and endogenize dividend policy and the optimal value of the firm under alternate formulations. Our results of low probability and low deviations post 90s compared to the 80s suggest a time series test of the credit spread puzzle. If strategic debt service resulting in APD is the cause of the credit spread puzzle, we should observe the disappearance of the credit spread puzzle in the 90s and later, consistent with the disappearance of APD (both in occurrence and magnitude). Attempts by recent papers such as Garlappi et al (2008), Garlappi and Yan (2011) to explain cross section of equity return using APD are also not likely to be successful in light of this paper's results. These papers in the asset pricing literature (Garlappi, Shu and Yan (2008) and Garlappi and Yan (2011)), take as its starting point the violation of APR in bankruptcy outcomes as a fact in order to explain cross sectional variation in stock returns using a long time period of data (1969 till date). Given that the new Chapter 11 bankruptcy law has been in existence only from 1978, such inferences must be cautiously interpreted. Even ignoring this issue, our results indicate that such inferences might be complicated by the changing nature of bankruptcy law in practice. The fact that APR violations have declined dramatically over the last 25 years, makes it unlikely to be a candidate explanation that explains cross section of equity returns, since models in these papers rely crucially on the magnitude of the

APR violations as a key parameter to generate their cross sectional empirical predictions. It is also unrealistic to argue that it is only expectations of APD that matter in these models. This is because one has to revise their priors on APD at some point, especially when confronted with 90% no violations and the median firm having zero APD. Our results highlight the importance of considering institutional factors such as bankruptcy bargaining leading to APD, that change over time carefully before attempting an explanation using these factors to solve asset pricing puzzles. Indeed, time and institutional invariant economic forces are likely to be better and more satisfactory explanations of these puzzles.

5 Conclusion

The U.S. Chapter 11 bankruptcy system has long been viewed as debtor friendly, with frequency of absolute priority deviations (APD) in favor of equity holders, as high as 75%, before 1990. In the 1991-2005 period, we find a secular decline in the frequency of APD to 22%, with the frequency as low as 9% for the period 2000-2005. We identify the increasing importance of debtor-in-possession (DIP) financing and key employee retention plans (KERP) in bankruptcy as the key drivers of this secular decline. We also find management turnover in Chapter 11 has increased by 65% since 1990 and that APD are more likely when management has substantial share holdings in the firm. The time spent in bankruptcy has also declined from about 23 months before 1990 to 16 months after 2000. Collectively, these results are consistent with the thesis that creditors now wield more power in the Chapter 11 reorganization process. We believe our results have important implications for models that assume that equity has a valuable dilatory option in the bankruptcy process to explain corporate financial behavior.

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