Chapter 14

BANKRUPTCY LAW

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Contents

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Abstract

Bankruptcy is the legal process whereby financially distressed firms, individuals, and occasionally governments resolve their debts. The bankruptcy process for firms plays a central role in economics, because competition drives inefficient firms out of business, thereby raising the average efficiency level of those remaining. The main economic function of corporate bankruptcy is to reduce the cost of default by having a government-sponsored procedure that resolves all debts simultaneously. The main economic function of personal bankruptcy is to provide partial consumption insurance to individual debtors and therefore reduce the social cost of debt. This chapter surveys theoretical and empirical research on both types of bankruptcy.

Keywords

Corporate bankruptcy, personal bankruptcy, small business, financial distress, reorganization, liquidation, absolute priority rule (or APR), limited liability, cramdown, prepack (or prepackaged bankruptcy), human capital, Chapter 11, Chapter 7, Chapter 13, option

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heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 4
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

1. Introduction

Bankruptcy is the legal process by which financially distressed firms, individuals, and occasionally governments resolve their debts. The bankruptcy process for firms plays a central role in economics, because competition drives the most inefficient firms out of business, thereby raising the average efficiency level of those remaining. Consumers benefit because the remaining firms produce goods and services at lower costs and sell them at lower prices. The legal mechanism through which most financially distressed firms resolve their debts and exit the market is bankruptcy. Bankruptcy is also the process by which individuals and married couples in financial distress resolve their debts, although financially distressed individuals—unlike firms—do not shut down or exit. Governments sometimes also use bankruptcy to resolve their debts. Like individuals but unlike firms in financial distress, they do not shut down.

This chapter discusses the economics of bankruptcy law. Since the literatures on corporate and personal bankruptcy have developed in isolation of each other, a goal of this chapter is to draw out parallels between them. It is useful to start by defining terms. Corporate bankruptcy refers to the bankruptcy of large- and medium-sized businesses, which for convenience I assume to be organized as corporations. Personal bankruptcy refers to the bankruptcies of individual households and small businesses. Small business bankruptcy is treated as part of personal bankruptcy, since small businesses are owned by individuals or partners who are legally responsible for their businesses' debts. When their businesses fail, owners often file for bankruptcy so that their businesses' debts will be discharged. Even when small businesses are incorporated, owners often guarantee the debts of their businesses, so that personal bankruptcy law applies at least in part.

Regardless of whether the debtor is a business or an individual, bankruptcy law provides a collective framework for simultaneously resolving all debts when debtors' assets are less than their liabilities. This includes both rules for determining how much of the debtor's assets must be used to repay debt and rules for determining how those assets are divided among creditors. Thus bankruptcy is concerned with both the size of the pie—the total amount paid to creditors—and how the pie is divided.

For corporations in financial distress, both the size of the pie and its division depend on whether the corporation liquidates versus reorganizes in bankruptcy and corporate bankruptcy law includes rules for deciding whether reorganization or liquidation will occur. When corporations liquidate, the size of the pie is all of the firm's assets. The size of the pie reflects the doctrine of limited liability, which exempts corporate shareholders from liability for the corporation's debts beyond loss of their shares. The proceeds of liquidating the corporation's assets are used to repay creditors. The division of the pie follows the absolute priority rule (APR), which carries into bankruptcy the nonbankruptcy rule that all creditors must be paid in full before equityholders receive anything. The APR also determines the division of the pie among creditors and requires that higher-priority creditors be repaid in full before lower-ranking creditors receive anything. Thus under the APR, each class of creditors either receives full payment of

its claims or nothing at all (except that the lowest-ranking class of creditors to be repaid receives partial payment).

When corporations reorganize rather than liquidate in bankruptcy, the reorganized corporation retains most or all of its assets and continues to operate. The funds to repay creditors then come from the reorganized firm's future earnings rather than from sale of its assets. The rules for dividing the pie in reorganization also differ from those in liquidation. Instead of dividing the assets so that creditors receive either full payment or nothing, most creditors receive partial payment and pre-bankruptcy equityholders receive some of the reorganized firm's new shares. Bankruptcy law again provides a procedure for determining both the size and division of the pie, but the procedure involves a negotiation process rather than a formula.

For individuals in financial distress, bankruptcy also provides a framework for resolving all of the individual's debts. Again the procedure includes both rules for determining how much of the consumer's assets must be used to repay debt (the size of the pie) and rules for dividing the assets among creditors (the division of the pie). In determining the size of the pie, personal bankruptcy law plays a role analogous to that of limited liability for corporate shareholders, since it determines how much of their assets individual debtors must use to repay their debts. Unlike corporations, individual debtors in bankruptcy are not required to use all of their assets to repay their debts. Instead, personal bankruptcy specifies exemption levels, which are maximum amounts of both financial wealth and post-bankruptcy earnings that bankrupt individuals are allowed to keep. Amounts in excess of the exemption levels must be used to repay debt. To divide the pie, personal bankruptcy specifies a division rule. As in corporate bankruptcy, the division rule may either be the APR or a rule under which all creditors receive partial payment.

An important difference between personal and corporate bankruptcy procedures is that true liquidation never occurs in personal bankruptcy (even though the Chapter 7 personal bankruptcy procedure in the U.S. is called liquidation). Debtors' wealth consists of two components: financial wealth (including home equity) and human capital. The only way to liquidate the human capital portion of individual debtors' wealth would be to sell debtors into slavery—as the Romans did. Since slavery is no longer used as a penalty for bankruptcy, all personal bankruptcy procedures are forms of reorganization in which individual debtors keep their human capital and the right to use it (or not use it) after bankruptcy.[1]

The economic objectives are similar in corporate and personal bankruptcy. One objective of bankruptcy is to repay creditors enough that credit remains available on reasonable terms. Reduced access to credit makes debtors worse off because businesses

[1] Both Britain and the U.S. used debtors' prison as a punishment for bankruptcy during the nineteenth century and, in earlier periods, Britain occasionally used the death penalty against debtors who defrauded their creditors. While prison and the death penalty waste debtors' human capital, they presumably cause debtors to use their financial assets to repay debt even though the assets could otherwise be hidden from creditors. See Baird (1987).

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 6
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

need to borrow in order to start up and grow and individuals benefit from borrowing to smooth consumption. On the other hand, repaying more to creditors harms debtors by making it more difficult for financially distressed firms to survive and more onerous for financially distressed individuals to work. Both the optimal size and division of the pie in bankruptcy are affected by this tradeoff. Another way of expressing the same objective is to give both corporate and personal debtors an incentive to invest and consume efficiently before and after they become financial distressed. A second objective of both types of bankruptcy is to prevent creditors from harming debtors by racing to be first to collect. This is because aggressive collection efforts by creditors may force debtor firms to shut down even though the best use of their assets is to continue operating and may cause individual debtors to lose their jobs (if creditors repossess debtors' cars or garnish debtors' wages). Finally, personal bankruptcy law has an additional objective that has no counterpart in corporate bankruptcy—to provide individual debtors with partial consumption insurance by discharging debt when repayment would cause a substantial reduction in debtors' consumption levels. This is because if consumption falls substantially, long-term harm may occur, including debtors' children leaving school prematurely in order to work or debtors' medical conditions going untreated and becoming disabilities.[2]

In 1984, there were approximately 62,000 business bankruptcy filings and 286,000 filings by individuals and married couples. By twenty years later in 2004, the number of business bankruptcy filings had fallen in half to 34,000, while the number of filings by individuals and married couples had increased more than five-fold to 1,583,000.[3] Concern about the rising number of individual bankruptcies led Congress to adopt reforms of personal bankruptcy law in 2005.

Part A of this chapter deals with corporate bankruptcy and Part B with individual and small business bankruptcy. Each part contains separate sections that outline the law, discuss theoretical research, and present the empirical evidence. A third topic that is not discussed—because it has received little attention from economists—is governmental or sovereign bankruptcy.[4]

[2] Baird (1987) points out that discharge of debt in bankruptcy originally applied only to merchants and was intended to prevent them from being forced to close their businesses if an adverse event occurred for reasons beyond their control (such as a merchant ship sinking). Thus discharge provided a type of insurance to business owners. Over time, discharge expanded from covering only business debt to covering individual debt. But it gradually became less important for business debt as the corporate form and limited liability developed.

[3] See *Statistical Abstract of the United States*, 1988, table 837, and Administrative Office of the U.S. Courts (for recent years).

[4] Chapter 9 of the U.S. Bankruptcy Code provides a bankruptcy procedure for local governments. It does not apply to state or county governments and has been used only rarely. See McConnell and Picker (1993) for discussion. There is currently no bankruptcy procedure for countries that default, although the International Monetary Fund has considered establishing one. There are several important differences between sovereign bankruptcy and corporate/personal bankruptcy. One is that creditors have very limited collection options against sovereign debtors, so that the race to be first among creditors is less important. Another is that the

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 7
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

Part A: Corporate bankruptcy

2. Legal background—corporate bankruptcy law

The U.S. has two separate bankruptcy procedures for corporations in financial distress, Chapter 7 for liquidation and Chapter 11 for reorganization. In Section 2 I discuss the two Chapters separately and then discuss out-of-bankruptcy resolution of financial distress.

2.1. Chapter 7 liquidation

When a corporation firm files under Chapter 7, the bankruptcy court appoints a trustee who shuts the firm down, sells its assets, distributes the proceeds to the firm's creditors, and dissolves the corporation. Legal efforts by creditors to collect from the firm are terminated and all creditors' claims must be resolved in the bankruptcy proceeding, regardless of whether they come due in the present or the future. The APR is used to determine the division of the liquidated assets among creditors. The APR carries over to the bankruptcy context the non-bankruptcy rule that creditors must be paid in full before equityholders receive anything, thus preserving creditors' non-bankruptcy rights vis-à-vis equityholders. But the APR also advances other claims so that they take priority over debt claims in bankruptcy. The highest priority under the APR goes to the administrative expenses of the bankruptcy process itself (including filing fees, lawyers' fees and the trustee's fee); followed by claims taking statutory priority (including tax claims, rent claims, and some unpaid wage and benefit claims); followed by unsecured creditors' claims (including trade creditors, bondholders, and those holding tort judgments against the firm). Equity has the lowest priority. Claims in each class are paid in full until funds are exhausted.

Within the class of unsecured claims, various rankings are consistent with the APR. If there are subordination agreements that place certain unsecured claims above others, then these are followed in bankruptcy. In the literature, the best-known ranking is the "me-first" rule of Fama and Miller (1972), under which unsecured claims take priority in chronological order based on when creditors made their loans. The opposite of the "me-first" rule is the "last-lender-first" rule, under which priority is in reverse chronological order. If there are no subordination agreements, then all unsecured claims have equal priority.

Secured creditors are outside the priority ordering. They have bargained with the firm for the right to seize a particular asset if the firm defaults and/or files for bankruptcy. Thus only assets that are not subject to secured creditors' liens are included in the pool

cost of default is very high, since default usually leads to a severe recession in the country's economy. Unlike bankrupt corporations but like bankrupt individuals, countries can only be reorganized ("restructured"), not liquidated. A final difference is that when countries default, the IMF plays an important role in restructuring negotiations. See White (2002) for discussion.

of assets used to pay other creditors. When firms liquidate in bankruptcy, often all or nearly all of their assets are subject to secured creditors' liens, so that other creditors receive nothing.

When creditors realize that a debtor firm might be insolvent, they have an incentive to race against each other to be first to collect. This is because, as in a bank run, the earliest creditors to collect will be paid in full, but later creditors will receive nothing. The race to be first is inefficient, since the first creditor to collect may seize assets that the firm needs for its operations and, as a result, may force the firm to shut down. Early shutdown wastes resources because the piecemeal value of the firm's assets may be less than their value if the assets are kept together and the firm sold as a going concern. However the existence of bankruptcy mutes creditors' incentive to race to be first. This is because when one creditor wins the race and tries to collect by seizing assets, the firm's managers are likely to file for bankruptcy. And because bankruptcy is a collective procedure that settles all claims at once according to the APR, a bankruptcy filing deprives creditors of their reward for winning the race. Muting creditors' incentive to race to be first by imposing a collective procedure for resolving all of the firm's debts is the traditional economic justification for bankruptcy (Jackson, 1986).

But bankruptcy does not abolish creditors' incentive to compete with each other. Instead, it replaces the race to be first to collect with a competition among creditors to leapfrog over each other in the priority ordering. The most common method by which creditors raise their priority is to shift from unsecured to secured status. They do this by negotiating with managers to renew their loans in return for obtaining a lien on a particular asset owned by the firm or, if the creditor is a bank, by requiring that the firm keep funds in an account at the bank (since these funds act as collateral for the bank's loan). If the firm is planning to file under Chapter 11 rather than Chapter 7, then another leapfrogging method is for creditors to raise their priority by renewing their loans after the firm files for bankruptcy, since doing so makes the loan an administrative expense of bankruptcy that takes highest priority. But when creditors compete to raise their priority in bankruptcy, the result is often that firms delay filing for bankruptcy because creditors renew their loans in return for higher priority. This delay is inefficient if the best use of the firm's assets is something other than their current use.

Bankruptcy liquidation procedures in other countries are similar to the U.S. procedure. But in the United Kingdom, one type of creditor, called a "floating charge" creditor, has the right to prevent managers from filing for bankruptcy. If the firm defaults, the floating charge creditor may liquidate any assets of the firm that are not subject to secured creditors' claims. Only after the floating charge creditor is repaid in full does the bankruptcy trustee begin to liquidate the firm's remaining assets for the benefit of other creditors. The partial liquidation by the floating charge creditor may cause firms to shut down even though their assets are more valuable if they continue to operate.[5]

[5] Webb (1991) analyzes U.K. bankruptcy procedures as a prisoner's dilemma and argues that, as a result, too much liquidation occurs. See also Franks and Sussman (2005).

2.2. Chapter 11 reorganization

In the U.S., managers of corporations in financial distress have the right to choose between filing for bankruptcy liquidation under Chapter 7 versus for bankruptcy reorganization under Chapter 11. Under Chapter 11, the firm continues to operate and pre-bankruptcy managers usually remain in control as "debtors-in-possession." A reorganization plan must eventually be adopted that resolves all of the firm's debts. Under the plan, firms repay part or all of their debt from future earnings, rather than from selling their assets.

Chapter 11 includes a number of provisions that are intended to aid financially distressed firms and increase the likelihood that they will continue operating. Creditors' efforts to collect from the firm are stayed and debtor firms cease making interest and principle payments to creditors until a reorganization plan goes into effect (although the firm must continue paying interest on secured loans). Also with the bankruptcy court's approval, firms in Chapter 11 may obtain new loans and give post-bankruptcy lenders highest priority, even though much of the payoff to post-bankruptcy creditors is likely to come at the expense of pre-bankruptcy creditors. This gives firms in Chapter 11 a new source of working capital. Also, firms in Chapter 11 are allowed to reject their unprofitable contracts and their traditional pension plans. Penalties for breach of contract become unsecured debts, so that they receive only a fractional payoff; while responsibility for meeting the obligations of under-funded pension plans goes to the Pension Benefit Guaranty Corporation—a U.S. government agency. Firms that reorganize successfully also escape the obligation to pay taxes on debt forgiveness until they become profitable. These provisions greatly improve the cash flow of firms in Chapter 11.

Firms in Chapter 11 must adopt reorganization plans that resolve all of their debts. Because the reorganized firm retains some or all of its pre-bankruptcy assets and pays creditors from its future earnings, the reorganization plan determines both the size of the pie and its division among creditors. Bankruptcy law affects the size and division of the pie by setting procedures both for bargaining over the terms of reorganization plans and for adopting them. For at least the first four months after the bankruptcy filing, managers have the exclusive right to propose a reorganization plan and creditors have only a take-it-or-leave-it choice. Managers' exclusive right to propose the plan reduces the size of the pie, because managers have an incentive to propose the smallest pie that creditors will accept. Furthermore, bankruptcy judges often extend managers' exclusivity period and this also reduces the size of the pie, since additional delay makes creditors willing to accept less. The most commonly-used procedure for adopting a reorganization plan is a voting procedure. Under it, each class of creditors must vote in favor of the plan by a margin of at least two-thirds in amount and one-half in number of claims and, in addition, two-thirds of all pre-bankruptcy equityholders must vote in favor. The less-than-100% voting requirement also reduces the size of the pie, because the plan does not have to satisfy the demands of holdout creditors in each class. Also the requirement that all classes of creditors and pre-bankruptcy equityholders vote in favor of the plan

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 10
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

means that even low-priority creditors and equityholders receive positive payoffs in reorganization.[6]

The rules of Chapter 11 also provide some protection for creditors. Reorganization plans that have met the voting requirements for adoption must also be confirmed by the bankruptcy judge. For a plan to be confirmed, the judge must decide that it meets the "best interest of creditors" test, which requires that each class of creditors receive at least what it would have received if the firm liquidated under Chapter 7. If the reorganization plan was rejected by one or more classes of creditors, then the judge can use "cramdown" to confirm the plan. Cramdown requires that classes of creditors that have rejected the plan receive either full payment of their claims over the period of the plan (usually 6 years) or else that all lower-ranking classes of creditors receive nothing. Alternately, the judge may allow creditors to offer their own reorganization plans, may replace managers, or may order that the firm be sold as a going concern under Chapter 11 or liquidated under Chapter 7. If the firm is sold under either Chapter, then the proceeds are distributed according to the APR. Thus, regardless of how firms emerge from Chapter 11, creditors must either receive as much or more than they would receive if the firm liquidated under Chapter 7.

Chapter 11 thus substitutes a bargaining process and a voting procedure for the actual sale of firms' assets that occurs in Chapter 7. In theory, the overall size of the pie and each creditor's individual slice must be at least as large in reorganization as in liquidation, since the "best interest of creditors" test requires that each class of creditors receive as much or more in reorganization as in liquidation. But in practice the size of the pie in reorganization could be smaller than in liquidation. This is because managers of large corporations rarely choose Chapter 7 when they file for bankruptcy, so that when large corporations liquidate, it is generally only after they have operated for prolonged periods in Chapter 11. While in Chapter 11, managers have little incentive to operate their firms efficiently and often bankruptcy court supervision fails to prevent waste and asset-stripping. When these firms eventually liquidate, the value of their assets tends to be very low. This means that even a low payoff to creditors in reorganization exceeds what they expect to receive in liquidation.[7] In addition, the division of the pie differs sharply in reorganization versus liquidation. In liquidation, high-priority creditors receive full payment and lower-priority creditors and equity receiving nothing;

[6] See Bebchuk and Chang (1992) for a common knowledge model of the bargaining process in Chapter 11 that uses the Rubinstein alternating offer bargaining game. They show how rules that favor managers/equity, such as giving managers the exclusive right to propose the first reorganization plan and requiring that the class of equityholders consents to the plan, reduce the amount that creditors receive. Other models of bargaining in Chapter 11 include Brown (1989), Baird and Picker (1991), and Aivazian and Callen (1983).

[7] The best-known example is Eastern Airlines, which filed for bankruptcy under Chapter 11 in 1989 and continued to operate for nearly two years. While in bankruptcy, its value fell by $2 billion. Many of its assets were sold to fund continued operating losses. When it finally shut down, secured creditors received 82% of their claims, unsecured creditors received 11%, and equity received nothing. See Weiss and Wruck (1998) for a detailed analysis.

while in reorganization, each class of creditors receives partial payment and equity receives some of the shares of the reorganized firm. Unsecured creditors and equity must receive something in order to obtain their votes for the reorganization plan, so that they get more in reorganization than in liquidation. But secured creditors usually receive less, because Chapter 11 delays or prevents them from seizing their collateral and the interest they receive is often insufficient to compensate them for the delay. Transfers from higher-priority to lower-priority creditors and/or from creditors to equityholders under Chapter 11 are referred to in the literature as "deviations from the APR." As will be discussed below, many economists have argued that the negotiation process in reorganization is itself economically inefficient and should be replaced.

The United Kingdom, France and Germany have all adopted new bankruptcy procedures recently that were intended to encourage reorganization of firms in financial distress. These procedures differ substantially from Chapter 11 and also differ substantially among themselves. In all three countries, pre-bankruptcy managers are given much less power over the reorganization process than they have in Chapter 11. Instead, the bankruptcy judge or an official appointed by the judge decides whether the firm will shut down or reorganize and, if reorganization is chosen, formulates the reorganization plan. In France, bankruptcy officials appointed to decide whether firms in bankruptcy will be liquidated or reorganized have "safeguarding the business" and saving jobs as their primary objectives. However in the United Kingdom and Germany, bankruptcy procedures are more pro-creditor than in the U.S. or France and reorganization is less likely to occur.[8]

2.3. Non-bankruptcy workouts

Because bankruptcy involves high transactions costs, managers of corporations in financial distress often attempt to avoid it by renegotiating the firm's debts outside of bankruptcy. These renegotiations, called workouts, are common in the U.S. (see below for evidence).

Workout negotiations usually involve managers proposing a plan for creditors to forgive part of the firm's debt and creditors deciding whether to accept or reject. Economists have pointed out two reasons why workouts tend to fail. One is the problem of strategic default, meaning that if creditors accept workout proposals, then managers have an incentive to offer them even when their firms are not in financial distress. Creditors can only discourage strategic default by rejecting workouts. The second is that individual creditors have an incentive to reject workout proposals and act as holdouts. This is because if most creditors accept the workout, then the debtor firm will repay the holdouts in full or at least strike a better deal with them. But if all creditors choose to be

[8] For comparisons between corporate bankruptcy reorganization procedures in the U.S. and other countries, see Franks, Nybourg, and Torous (1996), White (1996), Berkovitch and Israel (1999), and Franks and Sussman (2005).

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 12
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

holdouts, then workout proposals will fail. Managers in turn have two ways to increase the probability that workout proposals succeed. One is that if the workout proposal is supported by at least two-thirds of creditors in each class (by value), then managers can file for bankruptcy under Chapter 11 and use the workout proposal as the firm's reorganization plan. This is because, in bankruptcy, only a two-thirds majority of each class of creditors is needed for adoption of the plan. Using a workout proposal as a Chapter 11 reorganization plan is referred to as a prepackaged bankruptcy, or "prepack." Even though prepacks involve a bankruptcy filing, they are much quicker and less costly than normal bankruptcies. Managers' other method of increasing the probability that workouts are accepted is to make "coercive offers." Under the Trust Indenture Act of 1939, the financial terms of a bond issue cannot be changed outside of bankruptcy without the unanimous consent of bondholders, but non-financial terms can be changed by majority vote. Therefore managers offer a workout that involves a reduced payment to bondholders combined with changes in the non-financial terms that make the bond issue less valuable—such as ending public trading. If a majority of bondholders accepts the offer, then the changes in the non-financial terms go into effect and the holdouts are made worse off. Coercive offers give bondholders an incentive to accept workouts.[9]

As discussed above, individual creditors also have an incentive to improve their position in the priority ordering by negotiating individually with managers before managers propose a workout or file for bankruptcy. Banks and other short-term creditors have frequent opportunities to initiate negotiate with managers, since their loans come due frequently and are generally renegotiated and renewed. Long-term debts come due less frequently, but debt contracts contain clauses that allow creditors to declare the loan in default whenever any pre-specified event occurs, such as the firm's working capital falling below a certain level. Default accelerates the due date of the loan from the future to the present and therefore presents creditors with an opportunity to renegotiate. Long-term debt contracts often contain thousands of such clauses.[10] Creditors are generally better off when they negotiate individually with managers than when they participate in a collective negotiation such as a workout or a bankruptcy reorganization.

3. Research on corporate bankruptcy—theory

3.1. Effects of priority rules on the bankruptcy decision, managerial effort, and the choice between safe versus risky investments

Priority rules in bankruptcy affect the efficiency of managers' decisions both to invest in safe versus risky investment projects and to file for bankruptcy versus remain out of

[9] See Roe (1987), Gertner and Scharfstein (1991), and Schwartz (1993) for discussion and Kahan and Tuckman (1993) for a theoretical model which shows that coercive offers may succeed. Kahan and Tuckman also present empirical evidence that coercive offers do not make bondholders worse off, but their sample excludes firms in financial distress. Coercive offers are also used in renegotiation of sovereign debt. See White (2002).

[10] See Smith and Warner (1979) for discussion.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 13
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

bankruptcy. If managers invest in risky projects when safe projects have higher expected returns, then the additional return from the safe project is lost, and vice versa. If managers choose to avoid bankruptcy and continue the firm's operations, but its assets are more valuable in some alternate use, then resources are wasted. Conversely when managers choose liquidation but continuation has a higher expected return, the cost is that the firm's assets are shifted to alternative uses when they would be worth more if they remained together in their current use.[11] When managers invest inefficiently or make inefficient bankruptcy decisions, creditors' return is likely to be lower and they respond by raising interest rates and/or reducing credit availability.

It should be noted that models of the economic effects of priority rules include their effects on both the size and division of the pie. When "deviations from the APR" occur, the firm's pre-bankruptcy equityholders receive a positive payoff (rather than zero) and its creditors receive less. Thus deviations from the APR imply that the size of the pie falls. When one group of creditors leapfrogs over another, the division of the pie changes. But the size of the pie may also change if the firm's investment behavior is affected.

In this section, I first discuss basic models that illustrate these points and then turn to extensions, including models with asymmetric or incomplete information.

3.1.1. Models with complete information

Turn first to models of the bankruptcy decision.[12] Suppose a firm is in financial distress and managers—representing equity—are considering whether to file for bankruptcy. Assume initially that the only bankruptcy procedure is liquidation, so that managers' bankruptcy decision is a choice between liquidating the firm in bankruptcy versus continuing to operate the firm outside of bankruptcy. Managers make economically efficient choices if they file for bankruptcy whenever the firm's assets are more valuable in alternate uses and continue to operate whenever the firm's assets are more valuable in their current use. Assume that managers and creditors are fully informed about the value of the firm's assets in both their current and alternate uses.

Suppose the firm has total debt of D, divided between D_1 due in period 1 and D_2 due in period 2, where $D = D_1 + D_2$. The firm has no cash on hand. The liquidation value of the firm's assets in period 1 is L and, since $L < D$, it is insolvent. Managers can either file for bankruptcy in period 1 or continue the firm's operations outside of bankruptcy until period 2. In order for continuation to occur, managers must obtain a new loan that allows the firm to repay D_1 in period 1. The new lender, if one exists, is referred to as the bank and it must lend an amount $B_2 = D_1$. If the firm continues

[11] Railroads are an important example of firms whose assets are worth more if they remain together. Reorganization in the U.S. began as a procedure to prevent secured creditors from seizing and selling the track of financially distressed railroads, since track is worth little if it is dispersed. See Baird (1987) and Warren (1935).

[12] See Bulow and Shoven (1978), White (1980), (1983) and (1989), and Gertner and Scharfstein (1991).

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 14
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

to operate, it earns P_2 with certainty in period 2, but the liquidation value of its assets falls to zero. Ignoring the time value of money, continuation in period 1 is economically efficient if $P_2 > L$ and liquidation is economically efficient otherwise. At the end of period 2, assume that the firm is liquidated and the amount P_2 is distributed according to the APR. Priority among creditors in liquidation is according to "me-first," i.e., debts are paid in chronological order based on when the loans were made.

The bank and managers—representing equity—are assumed to act as a coalition in making the bankruptcy decision in period 1, so that the bank makes the loan if continuation benefits the bank and equity taken together. If the firm liquidates in period 1, equity receives nothing since $D > L$. If the bank lends and the firm continues to operate, the coalition receives $\max[P_2 - D_2, 0]$ in period 2, so that its net return is $\max[P_2 - D_2, 0] - B_2$. (This is because the debt D_2 has priority over the bank loan.) In order for the coalition to form and continuation to occur, this expression must be positive, which implies that $P_2 > B_2 + D_2 = D$. Since $D > L$, this means that $P_2 > L$. Thus the coalition chooses continuation only when it is economically efficient. However this efficiency result is one-sided, since the coalition sometimes chooses liquidation even when continuation is more efficient. Suppose $L < P_2 < D$. Then the coalition chooses liquidation, but continuation is more efficient.

Thus the result under the APR and the "me-first" rule is that too much liquidation occurs. This is because continuation increases the value of the debt D_2, but managers and the bank ignore this gain because they do not share it. This result is an example of Myers' (1977) "debt overhang" problem, since inefficient liquidation is more likely to occur when the firm's debt is high.

Now suppose the APR continues to hold, but priority among creditors is according to "last-lender-first." Then if the bank lends, its loan takes priority over the debt D_2 in period 2. In this situation, the coalition receives the first B_2 dollars of the firm's earnings in period 2, none of the next D_2 dollars, and all of the firm's earnings above $B_2 + D_2$. The condition for the coalition to form and the firm to continue operating therefore becomes $P_2 \geq B_2$. Therefore continuation is more likely to occur when "last-lender-first" priority is used than when "me-first" priority is used. Using the insolvency condition, the condition for continuation to occur can be expressed as $P_2 \geq B_2 \geq L - D_2$, while the condition for continuation to be efficient is $P_2 \geq L$. Thus under the "last-lender-first" rule, less inefficient liquidation and more inefficient continuation occur, because continuing the firm increases the value of the coalition at the expense of the debt D_2. The additional continuation is an example of how leapfrogging by creditors may reduce economic efficiency—here the increase in the bank's priority relative to the debt D_2 increases the probability of continuation even though liquidation may be more efficient.[13]

[13] See Bebchuk and Fried (1996) for an article questioning whether secured creditors should receive priority in bankruptcy. The model discussed here, in which last-lender-first priority is substituted for me-first priority, can alternately be interpreted as an illustration of the effect of a creditor shifting from unsecured to secured status. As the discussion shows, the shift increases the probability of inefficient continuation. See also Stulz and Johnson (1985).

Now suppose the firm's period 2 earnings are uncertain rather than certain. To keep the model simple, assume that period 2 earnings under continuation are either $P_2 + G$ or $P_2 - G$, each with 0.5 probability. Also assume that $P_2 + G \geq D_2 \geq P_2 - G$. Suppose again that the "me-first" rule applies, so that the debt D_2 has priority over the bank's continuation loan. Under these assumptions, the coalition's expected return if continuation is chosen is $0.5(P_2 + G - D_2) - B_2$ (since the coalition gets nothing if the firm is unsuccessful in period 2). This implies that the coalition chooses continuation if $P_2 \geq 2B_2 + D_2 - G$, but continuation is only efficient if $P_2 \geq L$. Thus if $2B_2 + D_2 - G < P_2 < L$, then continuation occurs but liquidation is more efficient, and if $L < P_2 < 2B_2 + D_2 - G$, then liquidation occurs but continuation is more efficient. As the firm's earnings become more uncertain (G rises), inefficient continuation is more likely to occur. This is because the coalition gains when the firm's return is risky, since it keeps the additional return in the good outcome, but shares the loss with the other creditor in the bad outcome. These results illustrate the moral hazard problem pointed out by Stiglitz (1972) and Jensen and Meckling (1976) that, in the presence of debt, managers favor risky projects over safe ones, even if risky projects offer lower expected returns, because equity gains disproportionately from risky projects if they succeed. This effect applies to the firm's bankruptcy decision as well as to investment decisions more generally.[14]

Now suppose Chapter 11 reorganization is introduced into the analysis. Suppose in period 1 the coalition chooses among liquidation under Chapter 7, reorganization under Chapter 11, or continuation outside of bankruptcy. Under Chapter 11, the firm does not have to repay the debt D_1 in period 1, but it must obtain a loan of T in period 1 to cover the transactions costs of the reorganization process. Assume that at the beginning of period 2, the firm adopts a reorganization plan that requires it to repay a fraction r of the debts D_1 and D_2. These payments are made in period 2.[15] Therefore the amount that the bank must lend the firm in order for the coalition to form is T rather than D_1. Assuming that $T < D_1$, the difference $D_1 - T$ represents the improvement in the firm's immediate cash flow that occurs when it files under Chapter 11. Assume also that the bank's loan takes post-petition priority over the firm's other debts as an expense of reorganization. Finally, assume that $P_2 + G > r(D_1 + D_2) + T$ and $P_2 - G > T$. Then if the firm reorganizes, the coalition's expected return net of the cost of the loan is $0.5(P_2 + G - r(D_1 + D_2)) + 0.5T - T$. Here the coalition receives $P_2 + G - r(D_1 + D_2)$ if the firm is successful in period 2 and T if the firm is unsuccessful. The coalition therefore prefers reorganization to both liquidation and continuation outside of bankruptcy if $0.5(P_2 + G - r(D_1 + D_2) - T) > \max[0.5(P_2 + G - D_2) - B_2, 0]$. Reorganization is more likely to be preferred to liquidation as G increases and reorganization is more

[14] The bias toward too much continuation becomes stronger when the bank is also the lender that is owed D_1. In this case the bank's opportunity cost of joining the coalition falls since it does not have to provide new funds.

[15] Alternately if the two debts had different priority, they might receive different repayment rates under the reorganization plan.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 16
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

likely to be preferred to both liquidation and continuation as T and r fall. Thus the introduction of reorganization as an alternative bankruptcy option makes it more likely that the firm will continue operating rather than liquidate, although it may operate in Chapter 11 rather than outside of bankruptcy. Relative to continuation, reorganization benefits the coalition by reducing the cost of the loan that the bank must provide in period 1 and by forgiving a proportion $(1 - r)$ of the firm's debt. But these benefits have little to do with whether it is economically efficient for the firm to continue operating. Since reorganization is economically efficient only when $P_2 > L$, the increase in the probability of failing firms continuing to operate is likely to be inefficient.

Now turn to the effect of priority rules on the efficiency of investment decisions that managers make ex ante, when the firm is not in financial distress. Bebchuk (2002) examines a model in which each firm has only one creditor, so that the only priority rules considered are the APR versus deviations from the APR. Bebchuk characterizes both as a proportional sharing rule under which equity gets a fraction α of the value of the firm's assets in bankruptcy. In Chapter 7 bankruptcy liquidation, there are no deviations from the APR, so that $\alpha = 0$. In Chapter 11 bankruptcy reorganization, deviations from the APR occur, so that $\alpha > 0$. Bebchuk assumes that creditors lend only if they expect to make zero profits. If the value of α changes, creditors adjust the interest rate so that expected profits remain equal to zero, i.e., they cannot be cheated by priority rule changes.[16]

Bebchuk compares the efficiency of ex ante investment incentives under the APR versus deviations from the APR. He shows, first, that at a given interest rate, equityholders are more likely to choose risky over safe investment projects when deviations from the APR occur. When there are no deviations from the APR, equityholders have an incentive to favor risky over safe projects because they receive all of the return net of interest payments when the project succeeds, but creditors bear most of the loss when the project fails. Deviations from the APR further increase the attractiveness of risky relative to safe projects, since equity's return remains the same when the project succeeds, but rises when the project fails. Second, Bebchuk shows that creditors raise the interest rate when α rises, both because equityholders are more likely to choose risky projects and because creditors gets less when failure occurs. Finally, higher interest rates further increase the likelihood that equityholders choose risky projects, since when interest rates are high, only investments that have very high upside returns allow managers to repay costly debt and still have something left over for equity if the investment succeeds. Thus introducing Chapter 11 as an alternative to Chapter 7 distorts the efficiency of investment incentives and causes equity to favor inefficiently risky projects even more strongly. The larger is α, the worse the distortion.

Bebchuk also uses his model to examine how priority rules affect the efficiency of investment incentives ex post, when firms are already in financial distress. He shows

[16] See below for empirical evidence concerning the size of α. Cornelli and Felli (1997) also model the effect of priority rules on ex ante efficiency.

that in this situation, the results are reversed and deviations from the APR reduce rather than increase equityholders' bias toward risky investment projects. This is because when the project is likely to fail and the firm to file for bankruptcy, equityholders' main return comes from their share α of the firm's value in bankruptcy. Therefore the safer the project, the more equity receives. As a result, if Chapter 11 reorganization is substituted for Chapter 7 liquidation as the bankruptcy procedure, there is an ambiguous overall effect on the efficiency of managers' investment decisions: they become less efficient ex ante but more efficient ex post.[17]

Overall, these models suggest that none of the commonly-used priority rules in bankruptcy always give managers/equityholders incentives to make efficient bankruptcy decisions or efficient investment choices. When firms are financially distressed and their future earnings are certain, the me-first and last-lender-first versions of the APR may result in either too much liquidation or too much continuation. As firms' future earnings become more uncertain, inefficient continuation is more likely to occur. When reorganization is introduced as a third bankruptcy option, the bias toward inefficient continuation becomes yet stronger. When the alternatives are no deviations from the APR versus deviations from the APR, then deviations from the APR worsen managers' bias toward choosing inefficiently risky investment projects ex ante, but have the opposite effect ex post. Although other priority rules might theoretically result in efficient bankruptcy and investment decisions, no general rule has been proposed.[18]

3.1.2. Models with asymmetric or incomplete information

Turn now to "filtering failure." Suppose there are two types of financially distressed firms: type 1 firms that are economically efficient and should reorganize versus type 2 firms that are economically inefficient and should liquidate. In the first-best bankruptcy outcome, all type 1 firms would reorganize and all type 2 firms would liquidate. "Filtering failure" occurs in bankruptcy whenever type 1 firms liquidate and/or type 2 firms reorganize. White (1994) examined an asymmetric information model of filtering failure under which managers of failing firms are assumed to know their firms' type, but creditors do not. The structure of the model incorporates features of U.S. bankruptcy law, including managers' right to choose between Chapter 7 versus Chapter 11, managers' right to offer the first reorganization plan under Chapter 11, and creditors' right to accept or reject managers' proposed plan. But the model ignores conflicts of interest among creditors.

[17] In the context of the model discussed above, equityholders receive $\alpha(P_2 - G)$ when the project fails, where failure is assumed to occur with high probability. Assuming that α is positive (Chapter 11 is in effect), equity's return rises as G falls, i.e., as the project becomes safer.

[18] See the discussion of contracting about bankruptcy below for discussion of alternate priority rules that achieve efficiency in particular models. These generally involve creditors promising to bribe managers to liquidate rather than reorganize in bankruptcy.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 18
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

Managers of type 1 firms always file for bankruptcy under Chapter 11, but they choose between offering reorganization plans with high versus low payoff rates to creditors. Managers of type 2 firms choose between filing under Chapter 7 versus Chapter 11. If they file under Chapter 11, then they offer the same low-payoff reorganization plans as type 1 firms. Creditors must decide whether to accept or reject managers' reorganization plans without knowing individual firms' types. Creditors always accept high-payoff reorganization plans, but they may either accept or reject low-payoff plans. If creditors accept low-payoff plans, then the plans go into effect and the game ends. If creditors reject low-payoff plans, then they are assumed to learn individual firms' types (because the bankruptcy judge replaces managers and gives creditors more control). If the firm turns out to be type 1, then creditors receive a higher payoff than if they had accepted managers' plan; but if the firm turns out to be type 2, then it liquidates and creditors receive less than if they had accepted. Thus rejecting a low-payoff reorganization plan is a gamble for creditors. Managers of both types of firms also gamble when they offer low-payoff plans rather than choosing their alternative strategy, since they are better off if creditors accept these plans but worse off if creditors reject.

I show that either efficient filtering or filtering failure may occur in equilibrium, depending on the proportion of firms in financial distress that are type 1 versus type 2. If most distressed firms are type 1, then creditors always reject low-payoff reorganization plans since their expected return when they reject these plans is higher. Therefore all type 1 firms offer high payment reorganization plans under Chapter 11 and all type 2 firms liquidate under Chapter 7. A separating equilibrium occurs in which there is no filtering failure. But if most distressed firms are type 2, then creditors always accept low-payoff plans and, as a result, managers of both types of firms always offer them. A pooling equilibrium therefore occurs in which there is filtering failure, since all type 2 firms reorganize when they should liquidate. There also may be mixed strategy equilibria in which some type 2 firms reorganize and others liquidate. The model thus suggests that filtering failure may occur in bankruptcy and that it takes the form of too much reorganization.

Now turn to strategic default and its interaction with bankruptcy costs. Suppose firms are either solvent or insolvent, and again only managers know their firms' types. Because the bankruptcy process is costly, it is efficient for firms that are in financial distress to avoid filing for bankruptcy by negotiating non-bankruptcy workouts. Suppose managers of both types of firms choose whether to propose a workout that will reduce payments to creditors. If managers propose a workout, then creditors must either accept or reject without knowing their firms' types. Creditors have an incentive to accept workout proposals, since accepting allows the firm to avoid filing for bankruptcy. But if creditors accept all workout proposals, then managers have an incentive to default strategically by proposing workouts even when their firms are solvent. In order to discourage strategic behavior, creditors must therefore reject some or all of managers' workout proposals. But if creditors reject workouts, then at least some firms in financial distress must end up in bankruptcy. The model thus implies that, when information is

asymmetric, either some strategic default or some costly bankruptcy (or a combination of both) must occur.[19]

A similar tradeoff occurs in financial contracting models.[20] The financial contracting literature considers the optimal method of financing investment projects when entrepreneurs/managers have projects but no cash and investor have cash but no projects. Suppose an investor lends D dollars to an entrepreneur in period 0. In period 1, the project either succeeds or fails. If it succeeds, then it generates a return of $R_2 > D$ in period 2 and an additional return of $R_3 > D$ in period 3. If it fails, then it earns zero in period 2, but it still earns R_3 in period 3. Also assume that the project's assets have a positive liquidation value of L in period 2, but zero in period 3. Since $R_3 > L$, it is efficient for the project to continue until period 3 regardless of whether it succeeds or fails.

Information is assumed to be incomplete in the sense that, while all parties can observe the firm's returns each period, investors and entrepreneurs cannot make a contract based on the firm's returns because they are not verifiable in court. But they can contract for entrepreneurs to make a fixed dollar payment to investors at a particular time and for investors to have the right to liquidate the project if the entrepreneur defaults. Suppose the parties to agree that the entrepreneur will pay investors D in period 2 and that investors will otherwise have the right to liquidate the firm in period 2 and collect L. Under this contract, entrepreneurs never default strategically: they repay D in period 2 if the project succeeds and they default only if it fails. Entrepreneurs prefer to repay in period 2 whenever they can, since they gain from retaining control and collecting R_3 in period 3. The contract does not call for the entrepreneur to pay anything to investors in period 3, since no obligation to pay is enforceable when the firm's liquidation value is zero.

While the contract eliminates strategic default, it results in costly bankruptcy. This is because investors liquidate all projects that default in period 2, but liquidation is always inefficient since it results in a loss of $R_3 - L$. If instead investors allowed entrepreneurs to remain in control following default, then entrepreneurs would default even when their firms were successful. Other possible contracts, such as investors playing mixed strategies, result in less bankruptcy but more strategic default (see Bolton and Scharfstein, 1996a). But because of incomplete information, no contract can eliminate both bankruptcy and strategic default.

Several papers in the financial contracting literature consider alternative ways of reducing strategic default. Bolton and Scharfstein (1996a) extend their model to consider the optimal number of creditors and find that, when entrepreneurs borrow from multiple creditors, they are less likely to strategically default. This is because strategic

[19] Other models of default and workouts include Schwartz (1993) and Gertner and Scharfstein (1991).

[20] This discussion draws on Hart and Moore (1998). The financial contracting literature is concerned with the more general problem of determining the most efficient method of financing investment projects. Debt contracts are shown to be efficient under fairly general assumptions, since they induce entrepreneurs to pay out some of their projects' returns to investors, rather than always defaulting.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 20
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

default only succeeds if none of the creditors liquidates the project and this outcome becomes less likely as the number of creditors increases. Berglof and von Thadden (1994) consider a similar model in which the project has both short-term and long-term debt. Short-term and long-term debtholders have differing stakes in the project, since the latter benefit from its future earnings, while the former do not. As a result, short-term debtholders are more likely to liquidate the project following default. Berglof and von Thadden show that entrepreneurs are less likely to default strategically if the investors who hold the project's short-term debt do not hold any of its long-term debt as well. Bester (1994) considers whether it is efficient for investors to lend on a secured rather than unsecured basis, where secured claims have the advantage that they reduce strategic default, but have the drawback of higher transactions costs. Bolton and Scharfstein (1996b) consider how debt contracts affect the competitive structure of the industry. Hart and Moore (1998) consider non-debt contracts.[21]

Another issue that is important for corporate (as well as personal) bankruptcy is how bankruptcy law affects entrepreneurs' effort levels. Povel (1999) uses a financial contracting model to analyze the tradeoff between entrepreneurs' effort levels and delay in filing for bankruptcy. Suppose entrepreneurs borrow in period 0 to invest in a project and choose their effort levels in period 1. Projects may turn out to be good, intermediate, or bad, where returns are highest for good projects, next highest for intermediate projects, and lowest for bad projects. Higher effort by entrepreneurs raises the probability that projects turn out to be good or intermediate, rather than bad. Higher effort is economically efficient, but it lowers entrepreneurs' utility. Investors are assumed unable to observe managers' effort levels. In period 2, the entrepreneur receives a signal concerning the project's type, which investors do not observe. If the signal is that the project's type is bad, then it is efficient to liquidate it immediately. If the signal is intermediate, then it is efficient for investors to rescue it by investing additional funds, where rescues convert projects with intermediate signals into projects equivalent to those that receive good signals. After receiving the signal, entrepreneurs must choose between filing for bankruptcy versus continuing to operate the firm outside of bankruptcy. Filing for bankruptcy reveals the signal to investors, while continuing outside of bankruptcy conceals it. If entrepreneurs file for bankruptcy, then investors rescue projects that have intermediate signals and liquidate projects that have bad signals. (Entrepreneurs do not file if their projects receive good signals.) In period 3, if the project is still in existence, its true type is revealed and it earns a final return. Entrepreneurs have an incentive to avoid filing for bankruptcy when their projects receive intermediate or bad signals, both because they benefit from remaining in control for longer and, since returns in period 3 are uncertain, delay may solve the firm's financial problems without investors' intervention. But delay is costly since rescues are only possible if they take place early.

[21] See also Webb (1987). An earlier literature, not discussed here, argued that amount of debt in firms' capital structures is determined by a tradeoff between the tax advantage of using additional debt rather than equity versus the increase in expected bankruptcy costs as debt increases. See, for example, Gordon and Malkiel (1981) and Bergman and Callen (1991).

Povel shows that the first best outcome is for entrepreneurs use high effort and to reveal information by filing for bankruptcy in period 2 whenever the signal is intermediate or bad. But this outcome does not occur in equilibrium. Povel analyzes the model under two different bankruptcy laws, which he refers to as "soft" versus "tough." "Tough" bankruptcy law corresponds to Chapter 7 liquidation and, under it, entrepreneurs are fired whenever they file for bankruptcy in period 2. "Soft" bankruptcy law corresponds to Chapter 11 reorganization. Under it, if entrepreneurs file for bankruptcy in period 2, they remain in control when the project has an intermediate signal and creditors rescue it, while they receive a payoff when the project has a bad signal and creditors liquidate it. Povel shows that, when bankruptcy law is soft, managers file for bankruptcy in period 2 whenever they receive intermediate or bad signals, since they are treated well. But because they have a soft landing in bankruptcy, they use less effort. In contrast when bankruptcy law is tough, managers never file for bankruptcy in period 2, since doing so costs them their jobs. But then they have an incentive to use high effort in order to increase the probability that the project's type will be good. Thus neither "soft" versus "tough" bankruptcy law results in both efficient effort levels and early bankruptcy filings. Depending on whether high managerial effort or early bankruptcy filings is more important, either type of bankruptcy law could be more economically efficient.[22]

Berkovitch, Israel, and Zender (1998) also analyze a model in which entrepreneurs make an effort-level decision that investors cannot observe and in which there is an early signal that the project's quality is good, intermediate or bad. But in their model, the signal is observed by both entrepreneurs and investors, so that there is no strategic default or delay in filing for bankruptcy. If the signal is bad, then investors liquidate the project, which is efficient. If the signal is intermediate, then the best outcome is for the project to continue operating without any additional investment. However the loan contract must be renegotiated, since the entrepreneur would abandon the project if investors had to be repaid in full. Berkovitch et al. show that entrepreneurs choose an efficient level of effort if, when the signal is intermediate, investors receive the project's liquidation value L if it liquidated immediately and the entrepreneur receives all of the project's final period earnings net of its liquidation value. This solution is efficient because it allows entrepreneurs to keep all of the marginal product of their extra effort. The efficient outcome can be implemented by either of two bankruptcy reorganization procedures: in the first, entrepreneurs and investors renegotiate their contracts and entrepreneurs are allowed to make take-it-or-leave it offers to investors; while in the second, the project is auctioned, but the original investors are not allowed to bid.[23] Then in equilibrium, entrepreneurs either make an offer of L to investors in the renegotiation and investors accept or entrepreneurs win the auction by bidding L. Thus the model suggests that in bankruptcy, either a renegotiation process (similar to the actual Chapter 11 procedure) or an auction

[22] Povel (1999) also considers which bankruptcy law the parties would prefer if they were allowed to choose when they write their contracts.

[23] The original investors are restricted from bidding because, unlike new investors, they have an incentive to bid more than L.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 22
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

process (similar to several bankruptcy reform proposals discussed below) can result in efficient outcomes. But the authors do not consider whether the same result would occur if only the entrepreneur received the signal.[24]

To summarize this section, theoretical models show that bankruptcy law affects managers' incentive to use effort, to default strategically when the firm is not in financial distress, to conceal the firm's financial distress from creditors, to file for bankruptcy too early or too late, and to choose inefficiently safe or risky investment projects. The models consider both the effects on economic efficiency of changing the priority rules in bankruptcy and changing bankruptcy law in other ways—including making either Chapter 7 or Chapter 11 the only bankruptcy procedure, substituting an auction process for the current negotiation process in Chapter 11, and compensating managers for liquidating projects that turn out badly. But the models suggest that, except in special cases, no one bankruptcy procedure results in economically efficient outcomes along all the dimensions considered. In the past, it was generally thought that using the APR to divide the assets of firms in bankruptcy led to economically efficient results. However the models discussed here suggest that use of the APR does not prevent managers from behaving inefficiently by choosing excessively risky investment projects, delaying too long before filing for bankruptcy, and/or concealing information about the firm's financial distress.

In the next section, I discuss the more law-oriented literature on bankruptcy reform.

3.2. Proposed reforms of Chapter 11—auctions, options, and bankruptcy by contract

A number of authors have argued for reforms of bankruptcy law. Many of the proposed reforms are based on the assumption that using the APR to divide the assets of firms in bankruptcy is optimal and that the current Chapter 11 negotiation procedure—which usually results in deviations from the APR—is sub-optimal. The reform proposals advocate substituting various market-based methods of valuing the assets of firms in reorganization for the negotiation procedure of Chapter 11. The justification for these proposals is that use of the market would result in more accurate valuations of bankrupt firms' assets and, if valuations were more accurate, then the APR (without deviations) could be used to divide firms' assets and efficiency would increase. As an example of how inaccurate valuations lead to deviations from the APR, suppose the true value of a firm's assets is $8 million and it has $8 million in high priority claims and $4 million in low priority claims. If the firm is valued at $8 million or less, then high priority creditors receive 100% of the claims against the reorganized firm, while low priority creditors and old equityholders receive nothing. But if the firm's valuation

[24] Other issues that have been explored in the literature include how bankruptcy law affects managers' incentives to invest in firm-specific human capital (see Berkovitch, Israel, and Zender, 1997), whether it is efficient for creditors or debtors to have the right to initiate bankruptcy (see Berkovitch and Israel, 1999), and how bankruptcy law affects the efficiency of buyers' and sellers' incentives to breach contracts and to make reliance investments (see Triantis, 1993).

instead is set at an inflated level of \$14 million, then high priority creditors receive only \$8 million/\$14 million = 57% of the claims against the reorganized firm, low priority creditors receive 29%, and equityholders receive 14%. Thus accurate valuations allow the firm's value to be divided according to the APR, while inflated valuations result in deviations from the APR. Negotiations over reorganization plans in Chapter 11 frequently result in inflated valuations, because adoption of a reorganization plan by the voting procedure requires that low priority creditors and equityholders vote in favor, and they only do so if they receive some of the claims on the reorganized firm. The reform proposals also abolish the voting procedure for adoption of reorganization plans in Chapter 11. This would have the effect of separating the decision concerning how to divide the value of the firm's assets from the decision concerning how to use the firm's assets. Some of the proposals also include new ways of determining how the reorganized firm's assets would be used, while others assume that the market will decide.

But it should be noted that the theoretical models discussed above paint a more nuanced picture of the efficiency of deviations from the APR. They cast some doubt on the idea that strict application of the APR in reorganization would increase efficiency.

3.2.1. Auctions

One proposal is to auction all firms in bankruptcy. If firms in Chapter 11 are operating, then they would be auctioned as going concerns and, if they have shut down, then their assets would be auctioned piecemeal. The proceeds of the auction would be distributed to creditors and equity according to the APR. This proposal would eliminate the distinction between reorganization and liquidation in bankruptcy. Under it, the winner of the auction—rather than the firm's old managers—would make the choice between shutting down the firm versus reorganizing it. This would increase efficiency since, while managers invariably favor reorganization over liquidation, buyers have their own money at stake and have an incentive to make value-maximizing decisions. Under the auction proposal, it is likely that fewer financially distressed firms would be saved and more would liquidate, i.e., there would be less filtering failure. An advantage of the auction proposal, along with similar market-based proposals, is that the reorganization process would be much quicker, since there would be no need to negotiate reorganization plans and have them approved. [25]

Roe (1983) proposed a variant on the auction idea for firms in Chapter 11 that are large enough to have publicly-traded equity. Under his proposal, reorganized firms would have all-equity capital structures and a small fraction of the reorganized firm's shares would be sold on the market during the reorganization process. The sale price of

[25] See Baird (1986), (1987) and (1993) and Jackson (1986) for discussion. Note that all of the reform proposals discussed here would require new bankruptcy legislation to be passed. For example, under current law it is difficult to auction firms that have filed under Chapter 11, since equityholders generally receive nothing in an auction and they can stop it from occurring by registering objections with the bankruptcy court.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 24
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

these shares would provide an objective basis for valuing the entire firm and this valuation would be used to divide the reorganized firm's value according to the APR. The same procedure could be used if the reorganized firm has debt in its capital structure, as long as the value of the debt is clear and the total amount of debt is low enough that the reorganized firm's shares would trade at a positive price. But Roe argues that debt should be limited in order to ensure the reorganized firm's financial viability. Roe does not specify a method for determining how the firm's assets would be used after reorganization. Presumably a buyer would eventually take control of the reorganized firm by purchasing a controlling interest in its shares.

Roe notes another problem with his procedure, which is that old equity and/or junior creditors may have an incentive to artificially bid up the price of the new shares, since a higher valuation increases their payoff. Suppose the reorganized firm has 10,000 shares, of which 1,000 are sold during reorganization for $100 each, so that the firm's total value is set at $1 million. Also suppose senior and junior debt have face values of $1.5 million and $500,000, respectively. Then junior creditors have an incentive to bid up the price of the new shares, since they receive nothing in reorganization unless the reorganized firm's value exceeds $1.5 million. Suppose they bid up the price of the new shares to $200 each. Then the reorganized firm's value would be set at $2 million and junior creditors would receive $500,000/2,000,000 = 25% of the shares. Since the firm's true value is $1 million, these shares would actually be worth $250,000. Temporarily bidding up the value of the new shares from $100 to $200 would be worthwhile to junior creditors if it cost less than this amount. Given the small number of shares sold during reorganization, manipulating the market might be relatively inexpensive and therefore worthwhile.

Other potential problems with bankruptcy auctions have also been noted. One problem is that, if few bankrupt firms are auctioned, then buyers may assume that they are lemons and respond with low bids. This problem would disappear if all firms in bankruptcy were auctioned. Another problem is that initial public offerings are expensive and risky, so that they may not be worthwhile for many firms in bankruptcy. A third problem is that bidders for a bankrupt firm are likely to be other firms in the same industry. But the financial condition of firms in particular industries tends to be positively correlated. This means that if one firm in an industry is bankrupt, then other firms in the industry are likely to be in financial difficulties as well and, therefore, their bids will be low. The result may be that the winning bidder is a firm in another industry, even though the buyer that can make the best use of the firm's assets is another firm in the same industry. Or it may mean that the best use of the firm's assets is for the old manager and creditors to remain in control, i.e., for the firm to be reorganized.[26] Finally, quick auctions of bankrupt firms may force bidders to make their bids when they are very uncertain about the firm's value. Thus while quick auctions save on bankruptcy costs, they may result in lower bids. An alternative would be to delay holding auctions while

[26] See also Baird (1993), Shleifer and Vishny (1992), and Berkovitch, Israel and Zender (1997) and (1998).

the bankruptcy trustee or an interim manager generates additional information about the bankrupt firm's true financial situation.

3.2.2. Options

Bebchuk (1988) and (2000) proposed using options rather than auctions to value the assets of firms in bankruptcy. His proposal allows creditors and equityholders to be compensated according to the APR even though the value of the reorganized firm's assets is uncertain. To illustrate, suppose a bankrupt firm has 100 senior creditors who are each owed \$1, 100 junior creditors who are each owed \$1, and 100 shares of equity. Also suppose the reorganized firm will have 100 shares of equity. Under the options approach, each junior creditor is given an option to purchase the interests of a senior creditor for \$1 and each equityholder is given an option to purchase the interests of a junior creditor for \$2. All options must be exercised at a particular date. One possibility is that neither the junior creditors nor the equityholders exercise their options, which means that shares are worth less than \$1. Then each senior creditor ends up with 1 share of the reorganized firm worth less than \$1 and junior creditors and equity receive nothing. Another possibility is that junior creditors exercise their options, but equityholders do not. This means that shares are worth between \$1 and \$2 each. Each senior creditor then ends up with \$1, each junior creditor ends up with 1 share of the reorganized firm minus \$1, for a net value of less than \$1, and equityholders receive nothing. The final possibility is that both junior creditors and equityholders exercise their options, so that shares are worth more than \$2 each. Then each senior and junior creditor ends up with \$1 and each equityholder ends up with one share of the reorganized firm minus \$2. Regardless of whether the options are exercised, the APR is always followed, since each creditor either ends up with full payment (\$1) or else ends up owning a share of the reorganized firm worth less than \$1 and lowering ranking claims receive nothing. Similarly, equityholders either pay \$2 for a share of the reorganized firm worth more than \$2 or else they receive nothing. A market for the options would operate before the exercise date, so that junior creditors and equityholders would have a choice between exercising their options if they think that doing so is worthwhile or selling their options if they are liquidity-constrained or do not think that exercising them is worthwhile. An important difference between the options proposal and other market-based proposals is that the reorganized firm ends up with debt in its capital structure, although some of the old debt is converted to equity.

In Bebchuk's proposal, there is no explicit method for determining whether the old managers will be replaced and how the reorganized firm's assets will be used. After the options are exercised, the new equityholders would elect a board of directors that would hire a manager—the same procedure as is followed by non-bankrupt firms. Aghion, Hart, and Moore (1992) extended Bebchuk's options scheme to include a vote by the new equityholders on how the reorganized firm's assets will be used. Under their proposal, the bankruptcy judge solicits bids that could involve either cash or non-cash offers for the reorganized firm's new equity or simply offers to manage the firm with the new

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 26
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

equityholders retaining their shares. The bids would be announced at the same time that the options are issued, so that the parties could use the information contained in the bids when they decide whether to exercise their options. After the options are exercised, the new equityholders would vote on the bids and the one receiving the most votes would be selected. Both Bebchuk (2000) and Aghion, Hart, and Moore (1992) argue that an advantage of the options process is its speed—firms would exit bankruptcy within a few months after filing.[27]

3.2.3. Contracting about bankruptcy

Bankruptcy is a mandatory procedure in the sense that, when firms become insolvent, the state-supplied bankruptcy procedure must be used to resolve creditors' claims. Debtors and creditors are not allowed to contract for any alternative dispute-resolution procedure or for any limits on debtors' right to file for bankruptcy and to choose between Chapter 7 versus Chapter 11. They also cannot contract out of use of the APR in Chapter 7. In this sense, bankruptcy differs from other aspects of commercial law, where the law provides a set of default rules, but the parties are generally allowed to contract out of the default rules by agreeing on alternative arrangements. Schwartz (1997) argued that efficiency would be enhanced if creditors and debtors could choose some of the characteristics of their bankruptcy procedure when they negotiate their debt contracts.[28] The argument that allowing parties to choose their own bankruptcy procedure could enhance efficiency makes sense in light of the models of Povel (1999) and Berkovitch, Israel, and Zender (1998), discussed above, which show that the optimal bankruptcy procedure varies depending on exogenous characteristics of the parties or the legal environment. This suggests that allowing debtors and creditors to contract over the bankruptcy procedure could potentially improve efficiency.

Schwartz first examines a model in which the bankruptcy procedure is mandatory. As under current bankruptcy law, he assumes that there are separate liquidation and reorganization procedures and debtors have the right to choose between them. Firms in financial distress are divided into two types: type 1's that have higher value if they reorganize and type 2's that have higher value if they liquidate. Schwartz assumes that debtors prefer reorganization over liquidation even when their firms are type 2, because reorganization allows them to remain in control and take perks for longer. Therefore under the mandatory bankruptcy regime, some or all type 2 firms reorganize when it would be more efficient for them to liquidate, i.e., filtering failure occurs. Filtering failure in bankruptcy reduces creditors' return, thereby raising interest rates and reducing the level of investment.

[27] However disputes over the priority of particular creditors' claims could delay the process. See also Hart et al. (1997) for a proposal that combines options and auctions. See Bebchuk (1998) for discussion of auctions versus options.

[28] See Rasmussen (1992) and Adler (1994) for a similar argument that the parties should be allowed to choose their bankruptcy procedure at the time they adopt a corporate charter.

Schwartz then examines whether filtering failure might be reduced if debtors and creditors were allowed to contract over certain aspects of bankruptcy. In the contracting regime, he assumes that separate liquidation and reorganization procedures still remain in effect and debtors still have the right to choose between them (the same as under mandatory bankruptcy). But now creditors and debtors are allowed to contract in advance for creditors to pay the debtor a pre-determined fraction of the firm's liquidation value if the debtor chooses liquidation rather than reorganization in bankruptcy. Thus while the mandatory bankruptcy regime uses the APR when liquidation occurs, debtors and creditors are allowed to contract for deviations from the APR when liquidation occurs. Schwartz shows that a bribe of this type can result in efficient bankruptcy filtering, i.e., managers of type 2 firms always choose liquidation and managers of type 1 firms always choose reorganization. This is because when managers of type 2 firms are rewarded rather than penalized for choosing liquidation, they are more likely to do so. (But the reward cannot be too high, or else managers of type 1 firms would also choose liquidation.) Schwartz also considers contracts that involve debtors and creditors agreeing to renegotiate when the firm is in financial distress and shows that these contracts can also lead to efficient bankruptcy filtering. Thus a variety of possible bankruptcy contracts leads to more efficient outcomes than the current mandatory bankruptcy regime.

Schwartz' results suggest that allowing debtors and creditors to contract about the bankruptcy process in theory could improve economic efficiency. However his model only begins to probe the issue, since it ignores important issues such as asymmetric information, strategic default, and conflicts of interest among creditors. In addition, bankruptcy contracting may harm certain types of creditors—such as tort and tax claimants and trade creditors—that do not have contracts with the firm. This is because debtors and contracting creditors have an incentive to agree on a bankruptcy process that diverts value from non-contracting creditors. This topic seems ripe for further research.[29]

3.2.4. Contracts as substitutes for bankruptcy

Adler (1993) suggested an approach to contracting about bankruptcy that involves completely abolishing bankruptcy. Under his approach, called "chameleon equity," insolvent firms would not file for bankruptcy. Instead some of their debts would be converted to equity, starting with the lowest priority claims. The new equity would replace old equity—thus preserving the APR. Enough debt would be converted to equity to restore the firm to solvency. Debt contracts would no longer give creditors the right to sue firms for repayment following default or to force defaulting firms into bankruptcy. Instead, they would contain procedures for converting debt into equity in the event of insolvency. As an example, suppose a firm's assets are worth $1,000,000, but it is insolvent because it has $1,000,000 in senior debt and $500,000 in junior debt. Then the junior debt would be converted to equity and the firm's old equity would be eliminated. These changes would restore the firm to solvency.

[29] The articles by Povel (1999) and Berkovitch, Israel, and Zender (1998) consider some of these issues.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 28
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

The proposal has a number of problems. An important one is that Adler assumes complete information, so that creditors and equity always agree on the firm's value. If the parties disagreed on the firm's value or the firm's value were unknown, then it would not be clear whether the firm is insolvent and if the debt conversion procedure should go into effect. Another problem is that if information were asymmetric, then managers would have a strong incentive to default strategically, i.e., to claim insolvency even when the firm's financial condition is good, since doing so allows them to avoid repaying the firm's debt. The lack of a penalty for default would undermine credit markets and greatly reduce credit availability. In addition, there would be a high level of filtering failure, since failing firms would continue to operate as long as their revenues covered variable costs, even if their assets were more valuable in some other use.

4. Research on corporate bankruptcy—empirical work

For reasons of data availability, most empirical research on corporate bankruptcy in the U.S. focuses on large corporations that have publicly traded debt or equity. This means that the studies all have small samples, since relative few large corporations file for bankruptcy. Also large corporations generally file for bankruptcy under Chapter 11, so that the available information about corporate bankruptcy is mainly for firms in Chapter 11. When large corporations liquidate in bankruptcy under Chapter 7, it is generally after a prolonged period of operating in Chapter 11 and failing to adopt a reorganization plan. This means that we know little about what would happen if large corporations filed under Chapter 7 and liquidated without first spending time in Chapter 11. It also means that comparisons of payoff rates to creditors of large corporations under Chapter 11 versus Chapter 7 are biased upward.[30]

Empirical research has concentrated on measuring the costs of bankruptcy and the size and frequency of deviations from the APR. More recent papers also examine how out-of-bankruptcy workouts and prepacks differ from normal Chapter 11 filings. In both workouts and prepacks, negotiations over a plan to restructure debt occur outside of bankruptcy. Depending on the outcome of the negotiations, the firm may file under Chapter 11 with a reorganization plan already agreed on or a restructuring plan might go into effect without a bankruptcy filing.[31]

4.1. Bankruptcy costs

An ideal measure of the costs of bankruptcy would cover both direct and indirect costs. Direct costs include the legal and administrative costs of bankruptcy, while indirect costs include all the costs of bankruptcy-induced disruptions, including asset disappearance,

[30] For an empirical study of small firms in bankruptcy, see LoPucki (1983).

[31] See the discussion of workouts and prepacks in Section 2.3 above.

loss of key employees, and investment opportunities foregone because managers' time is spent on the bankruptcy. Most studies measure only the direct costs of bankruptcy, because bankrupt corporations must report these costs to the bankruptcy court. Weiss' (1990) study of 37 corporate bankruptcies during the early 1980's found that the direct costs of bankruptcy averaged 3.1% of the combined value of debt plus equity. Other studies by have found similar results (see Ang, Chua, and McConnell, 1982).

Indirect bankruptcy costs are more difficult to measure, but are likely to be much greater than direct bankruptcy costs. White (1983) solved for upper bound expressions on indirect bankruptcy costs, using a coalition model of the bankruptcy decision. Her results suggest that the indirect costs of bankruptcy may be as high as twenty times the direct costs of bankruptcy.

Other studies provide indirect evidence suggesting that bankruptcy is very disruptive. Gilson (1990) and Gilson and Vetsuypens (1994) found that the turnover rates of top executives and directors were much higher for large corporations in Chapter 11 than for those not in bankruptcy. Carapeto (2000) found that when a large corporation in Chapter 11 offers multiple reorganization plans to creditors, the total amount offered declines by 14% between the first and the last plan. This implies that the marginal costs of remaining in bankruptcy longer increase quickly. Hotchkiss (1995) found that filing for bankruptcy under Chapter 11 and adopting a reorganization plan does not necessarily solve the financial problems of distressed corporations, since one-third of her sample of firms that successfully reorganized required further restructuring within a few years. Her results are consistent with a model in which some inefficient firms reorganize even though they should liquidate, but are also consistent with models in which reorganized firms fail simply because they have too much debt in their capital structures.

4.2. Deviations from the absolute priority rule

A number of studies have estimated the frequency and size of deviations from the APR. Following Franks and Torous (1989), these studies classify reorganization plans as involving deviations from the APR if equity receives more than it would under the APR and they measure the size of deviations from the APR by the amount paid to equity in violation of the APR divided by the total amount distributed under the reorganization plan. For example if a firm owes $1,000,000 to creditors, then deviations from the APR occur if equity receives anything when creditors receive less than $1,000,000. Assuming that the reorganization plan calls for creditors to receive $500,000 and equity to receive shares in the reorganized firm having a value of $50,000, then deviations from the APR amount to $50,000/500,000 or 10%.[32]

[32] This ignores the fact that payments to creditors under the plan are usually made over six years, so that additional deviations from the APR occur because payments are delayed and because the reorganized firm may later default. It also ignores deviations from the APR that involve payments to lower-priority creditors when higher-priority creditors are not repaid in full.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 30
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

Weiss (1990) examined a sample of 38 corporations that filed for bankruptcy. Of these, 31 adopted reorganization plans, of which 28 involved deviations from the APR. (The remaining seven corporations in his sample liquidated, including one that liquidated in Chapter 11.) Eberhart, Moore, and Roenfeldt (1990) found deviations from the APR in 23 of 30 reorganization plans they studied and Betker (1995) found deviations in 54 of 75 reorganization plans.[33] Carapeto (2000) found similar results using a more recent sample of firms in Chapter 11. Thus about three-quarters of Chapter 11 reorganization plans involve deviations from the APR. Turning to the size of deviations from the APR, Eberhart, Moore, and Roenfeldt (1990) found that the average deviation from the APR in their sample was 7.5%, with a range from 0 to 36%; while Betker (1995) found an average deviation of 2.9%.

How do deviations from the APR relate to the financial condition of corporations in Chapter 11? This relationship can be estimated by regressing the amount paid to equity as a fraction of unsecured creditors' claims on the amount paid to unsecured creditors as a fraction of their claims (i.e., the payoff rate to unsecured creditors). If the APR were always followed, the estimated coefficient of the payoff rate to unsecured creditors would be zero whenever creditors' payoff rate is less than 100%, but would become infinite whenever creditors' payoff rate exceeds 100%. Deviations from the APR are predicted to make this relationship positive even when creditors' payoff rate is low. But the coefficient of the payoff rate to unsecured creditors is predicted to rise as creditors' payoff rate approaches 100%.

White (1989) estimated this relationship, using data from the studies by LoPucki and Whitford (1990) and Eberhart, Moore, and Roenfeldt (1990). The results showed a smooth relationship with a gradually increasing slope. In particular equity receives a minimum payoff of about 5 percent of creditors' claims, regardless of how little creditors receive. When unsecured creditors' payoff rate is around 50%—a common figure—equity receives about 15% of creditors' claims and, when unsecured creditors' payoff rate reaches 90%, equity receives about 40% of creditors' claims. These results are consistent with a bargaining model of Chapter 11 such as Bebchuk and Chang (1992), in which equity gets a low payoff in return for giving up its right to delay adoption of the reorganization plan and gets more as equity's option on the firm comes closer to being in the money. Betker (1995) finds similar results. He also finds that deviations from the APR are smaller when a higher proportion of the firm's debt is secured.

Finally, several studies examine the frequency of out-of-bankruptcy workouts and compare them to Chapter 11 reorganization plans. Gilson, John, and Lang (1990) examined 169 large corporations that defaulted on their debt during the 1980s and found that 47% negotiated restructuring agreements that allowed them to avoid bankruptcy, while of the remainder, at least 70% attempted to restructure outside of bankruptcy, but failed and filed under Chapter 11. Thus about 85% of firms in their sample attempted

[33] See also LoPucki and Whitford (1990). These studies all involve samples of corporations that filed under Chapter 11 during the 1980's and there is considerable overlap.

to negotiate workouts, suggesting that workouts are the preferred procedure for corporations dealing with financial distress. However the percent of firms that succeeded in negotiating workouts outside of bankruptcy—47%—is much smaller than the percent of firms that succeeded in negotiating reorganization plans in bankruptcy—29/38 or 76% in Weiss' (1990) study. This suggests that strategic default is an important problem in workouts, i.e., creditors reject workouts because they believe that many firms are not truly in financial distress. Tashjian, Lease, and McConnell (1996) compared deviations from the APR in workouts versus Chapter 11 bankruptcies and found that workouts were associated with smaller deviations from the APR, i.e., creditors did better in workouts than in Chapter 11. This result also suggests that shareholders are in a weaker bargaining position in workout negotiations than in Chapter 11 negotiations.[34]

Part B: Personal bankruptcy

Like corporate bankruptcy procedures, personal bankruptcy procedures determine both the total amount that debtors must repay their creditors—the size of the pie—and how repayment is shared among individual creditors—the division of the pie. A larger pie benefits all individuals who borrow, because higher repayment causes creditors to lend more at lower interest rates. But a larger pie requires that debtors use more of their post-bankruptcy earnings to repay pre-bankruptcy debt, which reduces their incentive to work. A larger pie also affects whether debtors consume versus invest their wealth and whether they choose safe or risky investments. The division of the pie also has efficiency implications, because it affects whether creditors race against each other to be first to collect and how aggressively they pursue collection efforts. We discussed above how the race to be first to collect from corporate debtors has been replaced by a race to leapfrog over other creditors in the priority ordering. But in the consumer debt context, debts do not tend to be individually negotiated, so that creditors have a stronger incentive to race to be first. The race to be first can harm debtors, since they may stop working or lose their jobs if creditors repossess their cars or institute wage garnishment.

Despite these similarities, there are important differences between personal and corporate bankruptcy. One difference is that, while corporations in bankruptcy may either shut down/liquidate or continue to operate/reorganize, individual debtors in bankruptcy always reorganize. This is because an important part of individual debtors' assets is their human capital, which can only be liquidated by selling debtors into slavery. Since slavery is no longer used as a penalty for bankruptcy, all personal bankruptcy procedures are forms of reorganization.[35] Individual debtors keep their human capital and the right

[34] However Gilson, John, and Lang (1990) found somewhat contradictory results. See also Franks and Torous (1994) and Asquith, Gertner, and Scharfstein (1994).

[35] Both the U.S. and Britain also used debtors' prison in the past as a penalty for bankruptcy. But debtors' prison is inefficient as a punishment for bankruptcy because debtors cannot work (use their human capital) while in prison.

to use it and they keep some or all of their financial assets. Depending on the bankruptcy procedure, they may be obliged to use some of their wealth and/or some of their future earnings to repay debt. These features also characterize corporate reorganization under Chapter 11. Because there is no liquidation in personal bankruptcy, there is no "filtering failure," i.e., no deadweight costs occur as a result of individual debtors reorganizing in bankruptcy when they should liquidate or vice versa.[36]

Another difference between personal versus corporate bankruptcy is the insurance objective of personal bankruptcy. Individual debtors may suffer long-term harm if their consumption falls so much that they become homeless or their illnesses become disabilities for lack of medical care. Also, individual debtors' financial distress can have negative external effects on their family members, since sharp falls in consumption may cause debtors' children to drop out of school prematurely in order to work or may result in family members' illnesses going untreated. Personal bankruptcy reduces the probability of financial distress causing long-term harm to debtors or their family members by providing partial consumption insurance. It does this by discharging debt when debtors' wealth or earnings turn out to be low and they file for bankruptcy. The insurance objective of personal bankruptcy has no counterpart in corporate bankruptcy.[37]

As a result of these fundamental differences between personal and corporate bankruptcy, personal bankruptcy has exemptions that allow individual debtors to keep some of both their financial assets and their future earnings in bankruptcy, regardless of how much they owe. Higher exemptions for financial assets and future earnings benefit debtors and their family members by increasing their consumption when it would otherwise be very low. Higher exemptions for future earnings also increase efficiency by giving debtors stronger incentives to work/use their human capital after bankruptcy. But higher exemptions reduce the size of the pie, which makes borrowing less attractive to debtors. In contrast, there are no exemptions for corporations that liquidate in bankruptcy. However when corporations reorganize in bankruptcy, they keep their assets and repay creditors from their future earnings. "Deviations from the APR" are the corporate equivalent of personal bankruptcy exemptions, since they reduce the amount that debtors repay to creditors—i.e., they reduce the size of the pie.

This part of the chapter contains separate sections that discuss personal bankruptcy law, statistics on personal bankruptcy filings, theoretical research on personal bankruptcy, and empirical evidence concerning personal bankruptcy.

[36] Nonetheless, one of the two U.S. personal bankruptcy procedures is called liquidation. See the discussion below.

[37] Rea (1984) was the first to point out the insurance aspect of personal bankruptcy. Jackson (1986) argued that post-bankruptcy wages should be more fully exempt than financial wealth in personal bankruptcy, because of debtors' inability to diversify their human capital. See also Dye (1986) and Hynes (2002).

5. Legal background—personal bankruptcy law

The U.S. has two main personal bankruptcy procedures: Chapter 7—called "liquidation"—and Chapter 13—formally called "adjustment of debts of consumers with regular income."[38] I first discuss creditors' legal remedies outside of bankruptcy, then discuss Chapters 7 and 13, and finally discuss the main provisions of the recent (2005) bankruptcy reform.

5.1. Creditors' legal remedies outside of bankruptcy

When individual debtors default on their debt obligations but do not file for bankruptcy, creditors usually send letters and telephone, reminding debtors of the overdue debt and threatening to harm their credit ratings if they fail to repay. Creditors also add late charges and interest. Creditors' next step is to sue the debtor. On winning (usually by default), they can obtain a court order to garnish debtors' wages. Under the Federal Consumer Credit Protection Act, 75% of wages or 30 times the federal minimum wage per week, whichever is higher, is exempt from garnishment. A few states restrict garnishment more tightly, or ban it completely. Because the total amount that can be garnished is limited, creditors have an incentive to race to be first to garnish debtors' wages. However debtors often file for bankruptcy when their wages are garnished, since a bankruptcy filing terminates garnishment.[39]

Creditors can also seize debtors' bank accounts and/or foreclose on their houses, but they rarely do so. This is because each state has a set of exemptions for particular types of financial assets and the debtor receives up to the value of the exemption before the creditor receives anything. For example, suppose a debtor owes $10,000 on a credit card. The debtor also owns a house worth $100,000 that has a mortgage of $75,000 and the "homestead" exemption in the debtor's state covers home equity of $25,000 or more. Then foreclosing is not worthwhile for the credit card lender, since the mortgage lender receives the first $75,000 of the sale proceeds and the exemption covers the rest.

5.2. Chapter 7 "liquidation"

Although I argued above that all personal bankruptcy procedures are forms of reorganization, nonetheless one of the two U.S. personal bankruptcy procedures is called liquidation. When an individual or married couple files for bankruptcy under Chapter 7, the formal procedure is very similar to the corporate Chapter 7 bankruptcy procedure. Wage garnishment and other collection efforts by creditors terminate. Most unsecured

[38] A few individual debtors also file under Chapter 11 or Chapter 12 (intended for farmers).

[39] See White (1998a) for discussion and a state-by-state list of exemptions and limits on garnishment. The Consumer Credit Protection Act also restricts collection practices in other ways, such as limiting the hours during which creditors can call and preventing employers from firing workers the first time a creditor garnishes their wages.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 34
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

debts—including credit card debt, installment loans, medical debt, unpaid rent and utility bills, tort judgments, and business debt if the debtor owns an unincorporated business—are discharged. (Other types of debt, including secured loans, student loans, child support obligations, and debts incurred by fraud, cannot be discharged in Chapter 7.) All of the debtor's future earnings and some of the debtor's financial assets are exempt from the obligation to repay—the 100% exemption for future earnings is referred to as the "fresh start." The bankruptcy court appoints a trustee to find and liquidate all of the debtor's non-exempt financial assets and the absolute priority rule (APR)—discussed above—is used to divide the proceeds among creditors. Highest priority under the APR goes to the administrative expenses of the bankruptcy process itself; followed by priority claims (mainly taxes); followed by unsecured creditors' claims. Claims in each class are paid in full until funds are exhausted.

Secured creditors—mainly mortgage creditors who have liens on debtors' houses and automobile creditors who have liens on debtors' cars—are outside the priority ordering. In Chapter 7, the debtor has a choice between continuing payments on secured loans and retaining the collateral versus defaulting and giving up the collateral. If the debtor gives up the collateral and the bankruptcy trustee sells it, then the difference between the sale proceeds and the face value of the loan becomes an unsecured debt.

Thus under Chapter 7, the size of the pie—the pool of assets that debtors must use to repay creditors—is smaller for individual debtors than for corporations. This is because individual debtors benefit from the "fresh start" and the exemptions for financial assets, while exemptions for corporations in Chapter 7 are zero. Higher exemptions reduce individual debtors' obligation to repay and increase their minimum consumption levels, since they allow debtors to keep more of their financial assets (although higher exemptions have no effect on debtors' consumption if their assets are below the exemption levels). The responsibility to set exemption levels is split between the Federal government and the states. Federal law mandates the "fresh start" in Chapter 7, so that it applies all over the U.S.[40] There is also a set of Federal bankruptcy exemptions for various types of wealth. However in 1978, Congress gave the states the right to opt out of the Federal wealth exemptions by adopting their own, so that wealth exemptions vary across states. States' wealth exemptions apply both in and outside of bankruptcy, while the Federal wealth exemptions apply only in bankruptcy. States generally have separate exemptions for equity in owner-occupied homes ("homestead" exemptions), clothing and furniture, "tools of the trade," automobiles, retirement accounts, and other assets. Homestead exemptions in particular vary widely, from zero in the Delaware to unlimited in Texas, Florida and five other states. Because debtors can easily convert non-exempt

[40] Other countries do not generally apply the fresh start in bankruptcy. For example, in Germany, individual debtors are not allowed to file for bankruptcy voluntarily and their debts are not discharged in bankruptcy, although creditors' efforts to collect are stayed. Debtors are required to repay from future earnings. See Domowitz and Alexopoulos (1998) for discussion. Note that in the U.S., not all debt is discharged in bankruptcy, so that in practice debtors receive only a partial fresh start.

assets such as bank accounts into home equity before filing for bankruptcy, high homestead exemptions protect all types of wealth for debtors who are homeowners.[41]

Debtors can file for bankruptcy under Chapter 7 no more than once every six years. This means that the right to file for bankruptcy under Chapter 7 has an option value, since filing in the future may be more valuable than filing immediately.

5.3. Chapter 13 "adjustment of debts of consumers with regular income"

Individual debtors have the right to choose between Chapter 7 versus Chapter 13 when they file for bankruptcy. Under Chapter 13, they keep all of their financial assets, but they must propose a plan to repay part of their debt from future earnings over three to five years. The debtor proposes the schedule of payments—called a repayment plan. The plan must give creditors as much as they would have received under Chapter 7, but no more. (This is called the "best interest of creditors" test.)[42] If and when the debtor completes most or all of the payments under the plan, then the remaining debt is discharged. Unlike Chapter 11 for corporations, only the bankruptcy judge must approve repayment plans; creditors do not have the right to vote on repayment plans.

The "best interest of creditors" test implies that the size of the pie must be at least as large in Chapter 13 as in Chapter 7. Also because the test applies individually to all creditors, each slice of the pie must be at least as large in Chapter 13 as in Chapter 7. But because debtors are generally obliged to repay little or nothing in Chapter 7, repayment in Chapter 13 is also low, because most debtors would prefer to file under Chapter 7 if they had to repay more in Chapter 13. As a result, debtors in Chapter 13 often propose token repayment plans in which they promise to repay only 1% of their debts, and bankruptcy judges accept these plans since debtors would otherwise shift to Chapter 7.[43]

Chapter 13 has various special features that make it attractive to debtors in particular circumstances. Some types of debts—such as those incurred by fraud–can be discharged

[41] About one-third of the states allow their debtors to choose between their states' wealth exemptions and the Federal exemptions when they file for bankruptcy. See Lin and White (2001) for a list of wealth exemptions by state.

[42] An additional requirement for discharge of debt in Chapter 7, adopted by Congress in 1984, is that the bankruptcy petition not constitute "substantial abuse" of the Bankruptcy Code. In theory this requirement could force debtors with relatively high wealth or earnings to file under Chapter 13 and to repay more than they would under Chapter 7, because they would fail the "substantial abuse" test if they filed under Chapter 7. But courts have generally held that ability to repay debt does not by itself constitute "substantial abuse" of Chapter 7. Another requirement for approving a Chapter 13 repayment plan, also adopted in 1984, is that if creditors object to the proposed repayment plan, then debtors must use all of their "projected disposable income" for three years to repay. This requirement has also been ineffective, in part because it is difficult for judges to determine what income is or should be disposable, since high-earning debtors normally have high expenses. See White (1998b) and Hynes (2002) for discussion.

[43] Note that administration of Chapter 13 varies across bankruptcy judges. Some judges require debtors to repay more than would be required in Chapter 7 and others force many debtors to file under Chapter 13 even if they would benefit more under Chapter 7. Debtors who file under Chapter 13 often fail to complete their repayment plans. See Braucher (1993) for discussion and references.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 36
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

only in Chapter 13. Also debtors often file under Chapter 13 if they have fallen behind on their mortgage or car payments and wish to delay foreclosure while they make up the arrears. If the secured debt is a car loan, then filing under Chapter 13 is beneficial for debtors because the principle amount of the loan is reduced to the current market value of the car. Finally, debtors sometimes file under Chapter 13 because they have filed under Chapter 7 within the past six years and are therefore ineligible to file again. Debtors can file under Chapter 13 as frequently as every six months.

Overall, the bankruptcy exemptions and the relationship between Chapters 7 and 13 imply that there is a basic mismatch in U.S. personal bankruptcy law between individual debtors' ability to repay and their obligation to repay once they file for bankruptcy. Creditors lend to individual debtors based on their ability to repay, which increases with both financial assets and future earnings, and, outside of bankruptcy, debtors are obliged to use both assets and future earnings to repay. But once debtors file for bankruptcy under Chapter 7, their future earnings are completely exempt and some or all of their financial assets are also exempt. Even if debtors have appreciable financial wealth, they can often protect it in bankruptcy by converting it from a non-exempt form to an exempt form before filing. As a result, most individual debtors repay little in bankruptcy even when their ability to repay is high.

The Chapter 11 corporate reorganization procedure is similar to Chapter 13 in that corporate managers have the right to choose which Chapter they file under and corporate reorganization plans must only repay creditors in reorganization the amount that they would receive in liquidation. But the degree of the mismatch is greatly reduced for corporations, because corporations have no exemptions in Chapter 7 bankruptcy and no "fresh start." Corporate creditors also have the right to approve the firm's reorganization plan. As a result, corporations in Chapter 11 generally repay a much higher fraction of their debts than do individual in Chapter 13.

5.4. The new bankruptcy law

A new bankruptcy law was adopted in 2005, of which the main changes are in the area of personal bankruptcy.[44] Individual debtors must take a financial counseling course before filing for bankruptcy. Also, they must pass a series of means tests in order to file for bankruptcy under Chapter 7. If debtors' household income is greater than the median level in their state and if their disposable income over a five year period exceeds either $10,000 or 25% of their unsecured debt, then they must file for bankruptcy under Chapter 13 rather than Chapter 7. In addition, the homestead exemption is limited to $125,000 unless debtors have owned their homes for 3.3 years at the time they file for bankruptcy. Debtors' costs of filing for bankruptcy have sharply increased.

These changes are expected to reduce the number of personal bankruptcy filings by debtors who have relatively high earnings and they will also prevent millionaire debtors

[44] The new law is the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005. See White (2007) for discussion.

from moving to high exemption states such as Texas and Florida to shelter their millions from creditors. The reform also seems likely to reduce the number of filings by debtors with low earnings, since many of them will be unable to afford the new high costs of filing.

6. Trends in personal bankruptcy filings

The number of personal (non-business) bankruptcy filings increased from 241,000 in 1980 to more than 1.6 million in 2003—more than six-fold. During the 6-year period from 1980 to 1985, a total of 1.8 million personal bankruptcy filings occurred; while during the 6-year period from 1998 to 2003, there were 8.6 million filings. Since the same individual cannot file for bankruptcy under Chapter 7 more often than once every six years, this means that the proportion of households that filed for bankruptcy rose from 2.2% in 1980–1985 to 8.2% in 1998–2003. One of the important issues in personal bankruptcy is to explain the large increase in the number of filings.

Because Chapter 7 is so favorable to debtors, 70% of personal bankruptcy filing occur under Chapter 7. 95% of debtors who file under Chapter 7 have no non-exempt assets and repay nothing to creditors.[45]

7. Research on personal bankruptcy—theory

7.1. Optimal personal bankruptcy policy—consumption insurance and work effort

In this section I discuss a model of optimal personal bankruptcy exemptions that takes account of both the tradeoff between loan availability and work incentives after bankruptcy and the objective of insuring debtors against very low consumption levels.[46] However the model ignores conflicts of interest among creditors by assuming that each debtor has only a single creditor and it assumes that there are no alternate forms of consumption insurance, such as unemployment compensation, welfare, or income taxes. The model also assumes that there is only one personal bankruptcy procedure that combines Chapters 7 and 13. Under it, debtors may be obliged to repay from both financial wealth *and* post-bankruptcy earnings. This differs from current U.S. bankruptcy law,

[45] See Executive Office for U.S. Trustees (2001) for data on payoff rates. For bankruptcy filing data, see Statistical Abstract of the United States, 1988, table 837, and Administrative Office of the U.S. Courts (for recent years).

[46] The objective of minimizing negative externalities that harm debtors' family members, discussed above, is assumed to be part of the insurance objective. This section draws on White (2005), Fan and White (2003), Wang and White (2000), and Adler, Polak, and Schwartz (2000). Other theoretical papers on the economic effects of personal bankruptcy law include Domowitz and Alexopoulos (1998) and Athreya (2002) (exploring the macroeconomic effects of bankruptcy law).

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 38
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

which allows debtors to choose between two bankruptcy procedures and exempts either financial wealth or future earnings completely. In particular, the model examines whether and when the "fresh start" policy of exempting all post-bankruptcy wages is economically efficient. The fresh start has traditionally been justified based on the argument that it causes debtors to work more after bankruptcy, since they keep all of their earnings rather than paying them to creditors. But this argument has never been carefully analyzed.[47]

Suppose in period 1, a representative individual borrows a fixed amount B at interest rate r, to be repaid in period 2. The interest rate is determined by lenders' zero profit constraint. The loan is assumed to be the individual's only loan. In period 2, wealth is uncertain. The debtor first learns her period 2 wealth, then decides whether to file for bankruptcy, and, finally, chooses her period 2 labor supply. Period 2 labor supply depends on whether the debtor files for bankruptcy.

There is a wealth exemption X in bankruptcy that combines states' exemptions for home equity and other assets. It can take any non-negative dollar value. There is also an exemption for a fixed fraction m of post-bankruptcy earnings, where $0 < m \leq 1$.[48] Bankruptcy costs are assumed to be a fixed dollar amount, S. In bankruptcy, the debt is discharged, but the debtor must use all her non-exempt wealth and earnings (up to the amount owed) to repay.

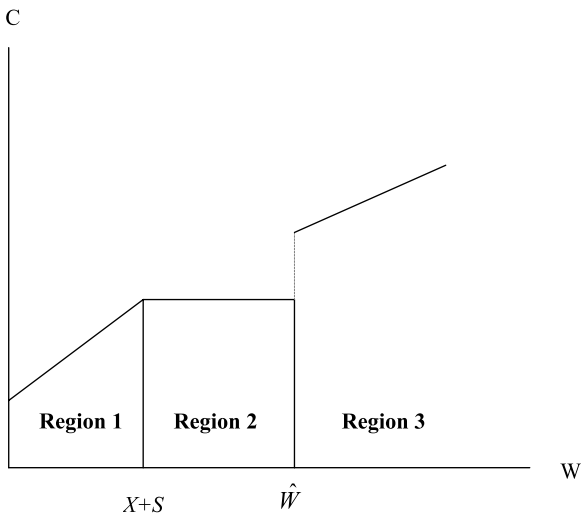
The representative individual's utility function is assumed to depend positively on consumption and negatively on labor supply in each period. Individuals are assumed to be risk averse. Period 2 work hours are denoted N_b in bankruptcy and N_n outside of bankruptcy, where N_b and N_n are both variables. When debtors file for bankruptcy, there is a negative substitution effect that causes their labor supply to fall, since debtors keep only the exempt fraction of their marginal earnings rather than 100% (assuming that $m < 1$). Filing for bankruptcy also causes a wealth effect on labor supply. If the substitution effect exceeds the wealth effect, then in the neighborhood of $\hat{W}$, $N_b < N_n$.[49]

Individual debtors decide whether to file for bankruptcy depending on which alternative maximizes their utility. (Note that debtors do not default without filing for bankruptcy—see below for discussion of the default decision.) Debtors file for bankruptcy in period 2 if their wealth turns out to be below a threshold level $\hat{W}$ and repay in full otherwise. Figure 1 shows debtors' period 2 consumption as a function of their period 2 wealth. Consumption is divided in three regions: region 3 where $W > \hat{W}$ and the

[47] The U.S. Supreme Court provided this justification for the fresh start: "from the viewpoint of the wage earner, there is little difference between not earning at all and earning wholly for a creditor." Local Loan Co. v. Hunt, 202 U.S. 234 (1934).

[48] Note that even a wealth exemption of zero provides some insurance to debtors, since their wealth cannot become negative as a result of debt repayment. The earnings exemption is assumed to be a fraction of earnings since the non-bankruptcy wage garnishment exemption takes this form. The latter covers 75% of earnings as long as weekly earnings exceed 30 times the Federal minimum wage rate. See Hynes (2002) for discussion of alternate ways of taxing debtors' post-bankruptcy earnings.

[49] See the empirical section below for evidence on the labor supply response to bankruptcy.



Note: The diagram shows period 2 consumption as a function of period 2 wealth, assuming that labor supply is fixed at N_b in bankruptcy and N_n outside of bankruptcy, where $N_n > N_b$. Debtors file for bankruptcy in regions 1 and 2 and do not file in region 3.

Figure 1. The insurance effect of bankruptcy.

debtor avoids bankruptcy and repays in full; region 2 where $X \leq W \leq \hat{W}$, the debtor files for bankruptcy and repays part of her debt from both wealth and future earnings; and region 1 where $W < X$, the debtor files for bankruptcy and repays only from future earnings. There is a discontinuous jump in consumption at $\hat{W}$ that reflects the effect of the discontinuous change in labor supply from N_b to N_n at $\hat{W}$. Assuming that labor supply falls when debtors file for bankruptcy ($N_b < N_n$), consumption must rise in order for debtors to be indifferent between filing versus not filing.

While increasing either of the two exemptions in bankruptcy provides debtors with additional consumption insurance in period 2, there are important differences between them. Raising the wealth exemption X transfers consumption from region 3 to region 2 of Figure 1, or from the highest to the middle consumption region. Consumption increases in region 2 since more of debtors' wealth is exempt; but it falls in region 3 since lenders raise interest rates. However raising the earnings exemption m transfers consumption from region 3 to regions 1 and 2 of Figure 1, or from the highest to the middle and lowest consumption regions. Consumption increases in both regions 1 and 2 since debtors keep a higher fraction of their earnings in bankruptcy. This means that the consumption insurance provided by a higher earnings exemption is more valuable at the margin than that provided by a higher wealth exemption, since only a higher earnings exemption raises consumption in the region where it is most valuable. This suggests a

new justification for the "fresh start"—that it provides particularly valuable consumption insurance.

Assume that there are many representative individuals and they all apply to borrow in period 1. Lenders' zero profit condition determines the market-clearing interest rate, r. When either of the exemption levels change, the interest rate also changes. At very high exemption levels, lenders may cease lending because no interest rate is high enough to satisfy the zero profit constraint.[50]

Because all individuals are identical in period 1, the representative individual's expected utility function is the same as the social welfare function. The optimal wealth and earnings exemption levels are therefore determined by maximizing the social welfare function with respect to m and X, subject to lenders' zero profit constraint.

The first order conditions determining the optimal wealth and earnings exemption levels have an intuitive explanation if debtors' period 2 work effort is assumed to be fixed rather than variable. In this situation, higher values of either m or X benefit debtors by providing additional consumption insurance. But debtors pay twice for the additional insurance: first in the form of higher interest rates and, second, in the form of higher expected bankruptcy costs, since debtors file for bankruptcy and pay the bankruptcy costs of S more often when exemption levels rise. Because creditors are constrained to break even, the first cost represents the fair price for the additional consumption insurance. But the second cost implies that debtors pay more than the fair price. This means that if debtors were risk neutral, they would prefer to forego consumption insurance completely and the optimal wealth and earnings exemption levels would both be zero. But if debtors are risk averse, then they prefer to buy some consumption insurance even though it costs more than the fair price. In the risk aversion case, the optimal earnings and wealth exemption levels occur where the declining marginal utility of additional consumption insurance is just offset by the marginal cost of insurance. As debtors become more risk averse, the optimal wealth and earnings exemptions rise.

Now consider how the optimal exemption levels are affected if debtors' period 2 labor supply varies in response to changes in the exemption levels. Introducing variable labor supply in bankruptcy adds two additional terms to the first order condition for the optimal earnings exemption. The first is the effect on debt repayment. Within the bankruptcy region, labor supply N_b now increases as m rises, so that debtors repay more in bankruptcy and creditors reduce interest rates. As a result, the consumption insurance provided by a higher earnings exemption becomes cheaper, debtors wish to buy more, and the optimal earnings exemption rises. The second of these terms involves the covariance of labor supply in bankruptcy with the marginal utility of consumption in bankruptcy. Since this covariance is positive,[51] variable labor supply causes period 2 consumption to become riskier, which makes consumption insurance more valuable. Variable labor supply thus causes the optimal earnings exemption to increase.

[50] See White (2005) and Longhofer (1997) for discussion.

[51] The covariance is positive because, within the bankruptcy region, higher wealth causes both labor supply and the marginal utility of consumption to fall.

Now consider how the optimal wealth exemption changes when period 2 labor supply is assumed to vary. Only one additional term is added to the first order condition for the optimal wealth exemption. Within the bankruptcy region, the larger exemption causes debtors' wealth to rise and their labor supply to fall, so that the wealth effect on labor supply is negative. Since there is no substitution effect on labor supply, the overall effect is that labor supply falls, debtors repay less in bankruptcy and creditors therefore raise interest rates. This makes the consumption insurance provided by the wealth exemption more expensive, so that debtors wish to buy less, and the optimal wealth exemption falls.

These results suggest that the first order condition for the optimal earnings exemption is likely to have a corner solution and the first order condition for the optimal wealth exemption to have an interior solution. Thus the optimal exemption policy is likely to be the "fresh start"—the 100% earnings exemption—combined with a less-than-unlimited wealth exemption.

Wang and White (2000) used simulation techniques to explore an extended version of the model in which there are two types of debtors—opportunists and non-opportunists. Non-opportunists behave as discussed above, but opportunists hide a fraction of their wealth when they file for bankruptcy. Since hiding wealth increases the gain from filing for bankruptcy, opportunists file more often than non-opportunists. (Opportunists do not hide any of their post-bankruptcy earnings in the model—perhaps because the bankruptcy trustee can check on debtors' earnings but not their wealth.) In Wang and White's model, debtors choose whether to behave opportunistically based on an individual taste for cheating. The more debtors behave opportunistically, the higher are interest rates and the worse off are non-opportunists.

Wang and White first show that when all individuals are non-opportunists, the optimal bankruptcy policy is always the fresh start combined with an intermediate wealth exemption. But when individuals are allowed to choose whether to be opportunists or not, then it is sometimes efficient to abolish the fresh start and set the earnings exemption below 100%. This is because the fresh start makes opportunistic behavior particularly attractive, since opportunists gain from hiding wealth in bankruptcy and also keep all of their post-bankruptcy earnings. But when the fresh start is abolished, opportunists' gain from hiding wealth comes at the cost of lower net earnings, since they pay the "bankruptcy tax" on earnings more often. Thus abolishing the fresh start is particularly effective in discouraging opportunism. Wang and White also find that, when the optimal bankruptcy policy is to abolish the fresh start by setting the earnings exemption below 100%, it is simultaneously efficient to raise the wealth exemption. This is because, since the two exemptions are partial substitutes in providing consumption insurance, it is efficient to offset a reduction in one exemption with an increase in the other.[52]

[52] Wang and White (2000) also found that as opportunists hide a larger fraction of their wealth when they file for bankruptcy, eventually the fresh start again becomes the optimal bankruptcy policy.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 42
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

The theoretical model of bankruptcy yields several testable hypotheses. Most involve hypotheses concerning how variable wealth exemption affect debtors' and creditors' behavior, since these predictions can be tested using the variation in wealth exemptions across U.S. states. First, in jurisdictions that have higher wealth exemptions in bankruptcy, consumption is more fully insured and therefore is predicted to vary less. Second, in jurisdictions with higher wealth exemptions, interest rates are predicted to be higher and the supply of credit is predicted to be lower. Third, if debtors are risk averse, then their demand for credit will be higher in jurisdictions with higher wealth exemptions, since they prefer to borrow more when the downside risk is lower. Fourth, if potential entrepreneurs are risk averse, then jurisdictions with higher wealth exemptions are predicted to have more entrepreneurs. This is because potential entrepreneurs are more willing to take the risk of going into business if a generous bankruptcy exemption reduces the cost of business failure.

I survey the empirical literature in Section 8 below.

7.2. Additional theoretical issues

Now turn to other theoretical issues.

7.2.1. Default versus bankruptcy

In the previous section, we assumed that debtors who default on repaying their debt always file for bankruptcy. But in reality, debtors may default without filing for bankruptcy or default first and file for bankruptcy later. When debtors default but do not file for bankruptcy, creditors may garnish a fraction—usually 25%—of debtors' wages. However, pursuing garnishment is a risky strategy for creditors, because debtors may turn out to be unemployed, may quit their jobs or be fired, or may file for bankruptcy in response to garnishment.

White (1998b) used an asymmetric information model to examine whether, in equilibrium, debtors might default but not file for bankruptcy. The model has two types of debtors, type A's and type B's. Both types decide whether to default, and, following default, creditors decide whether to pursue garnishment. The two types of debtors differ in how they respond to garnishment: type A's respond by repaying in full, while type B's file for bankruptcy. Creditors are assumed unable to identify individual debtors' types when they default. I show that, in equilibrium, all type B's default, type A's play mixed strategies (they either default or repay in full) and creditors play mixed strategies (they either pursue garnishment or not). This means that in equilibrium, some debtors default and obtain the benefit of debt forgiveness without bearing the cost of filing for bankruptcy or losing wages to garnishment. The model suggests that the U.S. personal bankruptcy system encourages some debtors to default even when they could repay their debts.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 43
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

7.2.2. Waiving the right to file for personal bankruptcy

In the corporate bankruptcy context, several researchers have argued that debtors should be allowed to waive their right to file for bankruptcy or to contract with creditors about bankruptcy procedures (see Schwartz, 1997, and the discussion above). But under current U.S. bankruptcy law, waivers are unenforceable and the rules of bankruptcy cannot be changed by contract. In this section I discuss whether debtors should be allowed to waive their right to file for personal bankruptcy.[53]

What does it mean for individual debtors to waive their right to file for bankruptcy? Debtors who issue waivers cannot obtain a discharge of their debts by filing for bankruptcy. However they can still default and, if so, they are protected by their states' wealth exemptions, which also apply outside of bankruptcy, and by the Federal or state limits on wage garnishment, which restrict garnishment to 25% of debtors' wages or less in a few states. Individuals who borrow and waive their right to bankruptcy make a default decision that is similar to the bankruptcy decision analyzed above. Applying the bankruptcy decision model discussed above to debtors' decision to default, debtors determine a threshold level of wealth such that they are indifferent between defaulting versus repaying in full. They default if wealth turns out to be less than this threshold.[54]

Would individual debtors ever choose to issue waivers? Formally, this amounts to a choice by debtors between facing the bankruptcy decision described in Section 7.1 versus facing a default decision with no option of filing for bankruptcy. Debtors would make this decision by comparing their ex ante expected utility in the two situations, with the expected utility expression for the bankruptcy decision evaluated at the relevant wealth and earnings exemptions in bankruptcy and for the default decision evaluated at the relevant garnishment exemptions and non-bankruptcy wealth exemptions in default. Interest rates would also differ in the two situations. Suppose creditors are allowed to garnish 25% of debtors' wages following default, while the fresh start prevails in bankruptcy. Then debtors who issued waivers would face more risk in their period 2 consumption, because their consumption in high wealth states would rise as a result of lower interest rates, but their consumption in low wealth states would fall because of wage garnishment following default. Debtors who issued waivers would probably

[53] See Rea (1984), Jackson (1986), and Adler, Polak, and Schwartz (2000) for discussion of waivers in the personal bankruptcy context. Jackson (1986) points out that not allowing waivers has the benefit of encouraging lenders to monitor to whom they lend. Rea (1984) considers the possibility of debtors agreeing to bear some pain, such as the pain of a broken arm, if they default. Adler, Polak, and Schwartz (2000) point out that giving a creditor security is equivalent to issuing a waiver for a particular debt, so that waivers are permitted if they take this form. Adler et al. also discuss reaffirmations, which involve debtors in bankruptcy agreeing to forego discharge of particular debts. These agreements are allowed because they occur after debtors file for bankruptcy.

[54] See Hynes (2004) for an argument that the system for protecting debtors outside of bankruptcy could substitute for the personal bankruptcy system. The main difference between the bankruptcy versus non-bankruptcy systems of protecting debtors is that debt is discharged only in bankruptcy. Hynes argues that debt could be discharged outside of bankruptcy by adopting short statutes of limitations for debt collection.

increase their work effort as a means of reducing risk. This suggests that debtors who are risk averse would not issue waivers. But now suppose there are both risk averse and risk neutral debtors, where the majority of debtors is risk averse and the minority is risk neutral. Then if the fresh start and a high wealth exemption in bankruptcy were adopted to accommodate the preferences of the risk averse majority, the risk neutral minority may prefer to issue waivers.

However there are a number of externality arguments that support the current policy of prohibiting waivers. One is that waivers may make individual debtors' families worse off, since spouses and children bear most of the cost of reduced consumption if the debtor has a bad draw on wealth, but debtors may not take this into account in deciding whether to issue waivers. Also, debtors may underestimate the probability of having a bad draw on wealth, so that they may issue waivers even when it is against their self-interest. Third, prohibiting waivers benefits the government itself, since its expenses for social safety net programs are lower when debtors can file for bankruptcy and avoid repaying their debts. Fourth, allowing waivers might have adverse macroeconomic effects. This is because debtors who issue waivers are more likely to repay than debtors who retain the right to file for bankruptcy. As a result, debtors who issue waivers reduce their consumption more in response to a bad draw on wealth. But if many debtors simultaneously reduce consumption, the economy could go into a recession.[55]

Finally, there is an information asymmetry argument in favor of prohibiting waivers. Suppose there are two types of debtors who differ not because they are risk averse versus risk neutral, but because they have high versus low variance of period 2 wealth. Also suppose creditors cannot observe individual debtors' types. If waivers are prohibited, then suppose a pooling equilibrium occurs in the credit market and all debtors borrow at an intermediate interest rate that reflects the average probability of default. But if waivers were permitted, then low variance debtors might prefer to issue them as a means of signaling their type. Lenders would then respond by lowering the interest rates they charge debtors who issue waivers (since they default less often) and raising the interest rates they charge debtors who do not issue waivers, i.e., the pooling equilibrium would be replaced by a separating equilibrium. In this situation, allowing waivers would be economically inefficient if the low variance debtors' gain is less than the high variance debtors' loss.[56]

7.2.3. The option value of bankruptcy

In the first section of this chapter, I discussed how the positions of corporate creditors and equityholders can be expressed as options. Similarly, the position of consumer

[55] Olson (1999) argues that the Great Depression resulted from many debtors' sharply reducing consumption in order to avoid defaulting on their debts (mainly car and furniture loans) after the stock market crash of 1929. At that time, most consumer debt was secured by the goods that the loans were used to buy. Debtors who defaulted lost the entire value of the collateral even if the remaining amount owed on the loan was small.

[56] See Aghion and Hermalin (1990) for a model in which the two types of debtors are entrepreneurs who have good versus bad projects.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 45
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

debtors can be expressed as put options. If debtors' future wealth turns out to be high, then they repay their debts in full. But if debtors' future wealth turns out to be low, then they can exercise their option to "sell" the debt to creditors by filing for bankruptcy. The price of exercising the put option is the amount that debtors are obliged to repay in bankruptcy, which equals the minimum of debtors' non-exempt wealth or zero.

White (1998a) calculated the value of the option to file for bankruptcy for households in the Panel Survey of Income Dynamics (PSID), a representative sample of U.S. households. The PSID asks questions concerning respondents' wealth at five-year intervals and, for many households in the panel, there are multiple observations on wealth. This allows a household-specific variance of wealth and a household-specific value of the option to file for bankruptcy to be calculated. The results showed that the value of the option to file for bankruptcy is high for households in all portions of the wealth distribution. The high value of the bankruptcy option suggests that one reason why the personal bankruptcy filing rate has risen over time is that, as of the early 1990's, the value of the option to file for bankruptcy was positive for many more households than the number that had already filed.

7.2.4. Bankruptcy and incentives for strategic behavior

A problem with U.S. personal bankruptcy procedures is that they encourage debtors to engage in strategic behavior in order to increase their financial gain from filing for bankruptcy. Under current U.S. law, debtors' financial benefit from filing for bankruptcy under Chapter 7 can be expressed as:

$$\textit{Financial benefit} = \max\{B(1+r) - \max[W - X, 0], 0\} - S \tag{1}$$

Here $B(1+r)$ is the amount of debt discharged in bankruptcy, $\max[W - X, 0]$ is the value of non-exempt assets that debtors must give up in bankruptcy, and S indicates bankruptcy costs, including legal and filing fees, the cost of bankruptcy stigma, the cost of reduced access to credit following bankruptcy. Equation (1) assumes that the fresh start policy is in effect, so that all post-bankruptcy earnings are exempt from the obligation to repay.

White (1998a and 1998b) calculated the financial benefit of filing for bankruptcy for each household in a representative sample of U.S. households—the 1992 Survey of Consumer Finances (SCF). (I assumed that bankruptcy costs, S, were zero.) The results were that approximately one-sixth of U.S. households had positive financial benefit and would therefore benefit from filing. I also examined how the results would change if debtors pursued various strategies to increase their financial gain from bankruptcy. The strategies are: (a) debtors converting assets from non-exempt to exempt by using non-exempt assets to repay part or all of their mortgages, if the additional home equity would be exempt in bankruptcy, (b) debtors moving to more valuable houses, if doing so would allow them to shelter additional non-exempt wealth in bankruptcy, and (c) debtors charging all of their credit cards to the limit, but not obtaining new credit cards. These strategies together increased the proportion of households that benefited

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 46
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

from bankruptcy from one-six to one-third. A final strategy involves debtors moving to Texas before filing, since Texas has an unlimited homestead exemption and also allows debtors to use the Federal bankruptcy exemptions, which are particularly favorable to renters. Combining all of these strategies implies that 61% of all U.S. households could benefit by filing for bankruptcy. These results suggest that, even with high bankruptcy filing rates, many more households in the U.S. could benefit from filing for bankruptcy than have already filed. They also suggest that the bankruptcy filing rate rose rapidly over the decade following 1992 because consumers learned that filing for bankruptcy was financially beneficial and many of them responded by doing so.

7.2.5. Bankruptcy and the social safety net

Personal bankruptcy is not the only source of consumption-smoothing insurance. Government safety net programs, including food stamps, welfare, unemployment insurance, workers' compensation, and the earned income credit, also insure consumption. While bankruptcy provides consumption insurance by forgiving individuals' debts when their wealth or earnings are low, safety net programs provide consumption insurance by giving additional cash or in-kind transfers to individuals whose wealth and earnings are low.

Jackson (1986) and Posner (1995) both pointed out that bankruptcy reduces the cost to the government of providing a social safety net. This is because, when individuals' debts are discharged in bankruptcy, their consumption levels rise and private lenders rather than the government bear the cost. Note that cost reduction for the government may also be an explanation for why bankruptcy law does not allow debtors to waive their right to file for bankruptcy.[57]

8. Research on personal and small business bankruptcy—empirical work

Researchers interested in the empirical research on personal bankruptcy owe a vote of thanks to the U.S. Constitution and to Congress. The U.S. Constitution reserved for the Federal government the power to adopt bankruptcy laws, which means that bankruptcy law is uniform all over the U.S. But in 1978, Congress gave the states the right to set their own wealth exemption levels, so that this aspect of bankruptcy law alone varies among the states. The states have also aided the research cause by adopting widely varying exemption levels and by making relatively few changes in their exemption levels since the early 1980's. This has allowed researchers to treat exemption levels starting

[57] Private lenders in turn shift the burden of bankruptcy onto non-defaulting debtors by raising interest rates. Similarly, the costs of programs such as unemployment compensation and workers' compensation are borne by workers who are not unemployed and not injured on the job, since these programs are financed by premiums paid by employers on behalf of all workers.

in the early 1980's as exogenous to whatever bankruptcy-related decision they are investigating.

In this section, I review research on the effect of bankruptcy exemptions on a variety of behaviors, including the decision to file for bankruptcy, the labor supply decision after bankruptcy, the decision to become an entrepreneur, and the availability of consumer and small business credit. Before doing so, I briefly examine research on the political economy of personal bankruptcy.

8.1. Political economy of bankruptcy

In the 19th century, some of the Western states competed for migrants by offering protection to debtors from their—presumably Eastern—creditors. Texas particularly followed this strategy during its period of independence from 1839 to 1845, because it expected the Mexican leader Santa Ana to re-invade and needed immigrants who could help in its defense. Texas therefore adopted the first property exemption, for homesteads. Texas' pro-debtor laws attracted immigrants from nearby U.S. states and these states responded by adopting generous exemptions of their own in order to compete. While pro-debtor laws presumably attract "deadbeats," they are likely to be entrepreneurial and well-suited to the needs of a frontier economy. Even today, most of the states that have unlimited homestead exemptions form a cluster near Texas. They include, besides Texas, Arkansas, Oklahoma, Kansas, Iowa and South Dakota. In addition, Florida has an unlimited homestead exemption and Minnesota had one from the early 1980's until 1996.

Brinig and Buckley (1996) examined whether states still use bankruptcy policy to attract migrants, using data from the late 1980's. Rather than use exemption levels as their measure of bankruptcy policy, they used bankruptcy filing rates. This means they assume that states with high bankruptcy filing rates have debtor-friendly policies and vice versa. They found that states with higher bankruptcy filing rates had higher immigration rates than states with lower bankruptcy filing rates. To some extent, these results seem surprising, since states with higher bankruptcy filing rates are likely to have scarce and expensive credit. Brinig and Buckley's results suggest that immigrants in general are more concerned about fleeing their old creditors than about obtaining credit to set up new businesses. Brinig and Buckley did not test whether higher exemption levels attract more immigration.

Hynes, Malani, and Posner (2004) examine the determinants of states' bankruptcy exemption levels and test a variety of interest group explanations for exemption levels. The only variable that they found was significantly related to current exemption levels is states' exemption levels in the 1920's. Thus whatever factors determine states' exemption levels, they appear to be very persistent.[58]

[58] See Posner (1997) for discussion of political economy issues in the adoption of the Bankruptcy Code of 1978.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 48
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

8.2. Studies of the bankruptcy filing decision using aggregate data

The earliest empirical work on the bankruptcy filing decision used aggregate yearly data for the U.S. to show that the passage of the 1978 Bankruptcy Code (the current U.S. bankruptcy law) caused the number of bankruptcy filings to increase. See Shepard (1984), Boyes and Faith (1986), Peterson and Aoki (1984), and Domowitz and Eovaldi (1993). A weakness of these studies is that they could only examine the overall effect of the new Code's adoption on the bankruptcy filing rate. Because the 1978 Code made many changes in bankruptcy law, these studies capture the overall impact of the changes on the bankruptcy filing rate, but cannot isolate which particular features of the Code caused the filing rate to rise. Buckley (1994) used aggregate data for the U.S. and Canada to show that the bankruptcy filing rate in the U.S. is consistently higher. He attributes this result to the fresh start policy in the U.S., which gives U.S. debtors a wider discharge from debt than Canadian debtors receive.

The theoretical model discussed above predicts that consumers are more likely to file for bankruptcy when their financial benefit is higher (see Equation (1) above). Since financial benefit is positively related to the wealth exemption, this implies that filings will be higher in states with higher wealth exemptions. Aggregate data at the national level does not allow this prediction to be tested, but aggregate data at the state or sub-state level does. White (1987) used aggregate county-level data from the early 1980's to test this relationship and found a positive and significant relationship between exemption levels and the bankruptcy filing rate. Buckley and Brinig (1998) did the same type of study using aggregate data for a panel of states during the 1980's, but did not find a significant relationship. The Buckley-Brinig results for exemption levels are not surprising, since they included state dummy variables in their model. In their specification, the state dummies capture the effect of states' initial exemption levels, while the exemption variables themselves capture only the effect of changes in exemptions. The exemption variables were probably found to be insignificant because few states changed their exemptions during the period covered by the study.

8.3. Studies of the bankruptcy filing decision using household-level data

Efforts to estimate models of the bankruptcy filing decision using household-level data were initially hampered by the fact that none of the standard household surveys used by economists asked respondents whether they had ever filed for bankruptcy. In an innovative study, Domowitz and Sartain (1999) used choice-based sampling to get around this limitation by combining two data sources: a sample of households that filed for bankruptcy in the early 1980's and a representative sample of U.S. households—the 1983 Survey of Consumer Finances (SCF)—that included information on households' income and wealth. They found that households were more likely to file for bankruptcy if they had greater medical and credit card debt and less likely to file if they owned a home.[59]

[59] Domowitz and Sartain also estimated a model of debtors' choice between Chapters 7 versus 13.

In 1996, the Panel Survey of Income Dynamics (PSID) ran a special survey that asked households whether they filed for bankruptcy during the previous decade and, if so, in what year. Because the PSID is a panel dataset that surveys the same households every year and collects data on income and wealth, this data allowed a model of the bankruptcy filing decision to be estimated using a single dataset.

The economic model of bankruptcy discussed in the previous section implies that consumers are more likely to file for bankruptcy when their financial benefit from doing so is higher. Specifically, Equation (1) predicts that only wealth, the bankruptcy exemption, the amount owed, and bankruptcy costs affect debtors' filing decisions, since these are the only variables that affect the financial benefit from filing. The economic model also predicts that income will not affect the bankruptcy decision, because it does not enter Equation (1). An alternative, sociologically-oriented model of the bankruptcy filing decision was proposed by Sullivan, Warren, and Westbrook (1989). It argues that debtors never plan for the possibility of bankruptcy nor act strategically to take advantage of it. Instead, they file for bankruptcy only when an unanticipated event occurs that reduces their earnings or increases their expenses to the point where it is impossible for them to repay their debts. In this view, the important factors affecting the bankruptcy decision are ability to repay, as measured by income, and whether adverse events have occurred that reduce ability to repay, such as job loss, illness or divorce.

The PSID data allows the two models of the bankruptcy decision to be tested against each other, since the economic model predicts that wealth rather than income determines whether debtors file for bankruptcy, while the sociological model predicts that income is the most important determinant. But in practice the test of the two models is somewhat imprecise. This is because the PSID asks questions about respondents' non-housing wealth only at five-year intervals. As a result, wealth is unknown in most years and changes in wealth over time tend to be highly correlated with household income.

Fay, Hurst, and White (FHW) (2002) used the PSID to test the two models of households' bankruptcy decisions. Their dataset consisted of PSID households in 1984 to 1995, the years covered by the PSID's 1996 bankruptcy survey. The main explanatory variable was households' financial benefit from filing in each year, calculated according to Equation (1). Other explanatory variables included household income and whether the respondent was divorced or experienced other adverse events during the previous year.

FHW found that consumers are significantly more likely to file for bankruptcy when their financial benefit from filing is higher: if financial benefit increased by $1,000 for all households, then the model predicts that the bankruptcy filing rate in the following year will rise by 7 percent. Thus the empirical evidence supports the economic model of the bankruptcy filing decision. But FHW also found that ability to repay affects the bankruptcy decision, since households with higher incomes are significantly less likely to file. They also tested whether adverse events affect the bankruptcy decision and found that neither job loss nor illness of the household head or spouse in the previous year was significantly related to whether households filed for bankruptcy. But a divorce in the previous year was found to be positively related to the probability of filing and the result

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 50
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

was marginally statistically significant. Thus the results support the economic model of bankruptcy. The results concerning income also support the sociological model of bankruptcy, but they do not support the hypothesis that bankruptcy filings are triggered by adverse events.[60]

FHW also investigated why bankruptcy filings have been rising over time. An additional factor that affects households' filing decision is the level of social disapproval of bankruptcy, or bankruptcy stigma. Surveys of bankruptcy filers suggest that they usually learn about bankruptcy from friends, relatives, or co-workers, who tell them that the bankruptcy process is quick and easy. This information both reduces debtors' apprehension about filing and also passively sends the message that the level of bankruptcy stigma is low, since friends and relatives have filed and are willing to talk openly about their experiences. FHW assumed that the level of bankruptcy stigma in a household's region was inversely proxied by the aggregate bankruptcy filing rate in the region during the previous year, i.e., the higher the aggregate filing rate in the previous year, the lower the level of stigma. They tested this variable in their bankruptcy filing model and found that, in regions with higher aggregate filing rates (lower bankruptcy stigma), the probability of households filing for bankruptcy was significantly higher. This suggests that as households in a region learn about bankruptcy, the filing rate rises.

Another recent study also examined the role of stigma in debtors' bankruptcy decision. Gross and Souleles (2002) used a dataset of credit card accounts from 1995 to 1997 to estimate a model of individual debtors' decisions to default and to file for bankruptcy. Their explanatory variables included measures of each cardholder's riskiness and the length of time since the account was opened. Their measure of bankruptcy stigma was the residual. They found that over the two year period from 1995 to 1997, the probability that debtors filed for bankruptcy rose by 1 percentage point and the probability that debtors defaulted rose by 3 percentage points, holding everything else constant. The authors interpret their results as evidence that the level of bankruptcy stigma fell during their time period.

Ausubel and Dawsey (2004) used credit card data to estimate a model of individual debtors' decisions both to default—which they refer to as "informal bankruptcy"—and to file for bankruptcy. In their model, debtors first decide whether to default and then, conditional on default, they decide whether to file for bankruptcy. Ausubel and Dawsey find that homestead exemptions mainly affect the decision to default; while garnishment restrictions mainly affect the decision to file for bankruptcy conditional on default. These results are not surprising, since homestead and other exemptions apply regardless of whether debtors file for bankruptcy or not, while garnishment restrictions apply

[60] Fisher (2003) re-estimated FHW's model of the bankruptcy decision, adding as an additional explanatory variable individuals' income from government safety net programs. He found that increases in both earned income and income from safety net programs reduce individuals' probability of filing for bankruptcy—a result that supports the Jackson/Posner hypothesis that bankruptcy and government safety net programs are substitutes.

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 51
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

only in bankruptcy. Ausubel and Dawsey argue that researchers have overlooked the importance of informal bankruptcy and the effect of garnishment restrictions on whether households file for bankruptcy, while overemphasizing the importance of exemptions. But their empirical results provide additional support for the economic model of the bankruptcy/default decision. See also Agarwal, Diu, and Mielnicki (2003).

8.4. Empirical research on work effort and the "fresh start"

As discussed above, the Supreme Court justified the "fresh start" in bankruptcy (the 100% exemption for post-bankruptcy earnings) on the grounds that debtors work more after filing for bankruptcy, because they keep all rather than part of their earnings after filing. The Justices did not state precisely what model they had in mind. One possibility is a model in which debtors have already defaulted and are subject to wage garnishment outside of bankruptcy. Then because the fresh start applies in bankruptcy, filing allows debtors to keep all of their earnings at the margin, so that the substitution effect of filing leads to an increase in labor supply. However in this model, filing for bankruptcy also increases debtors' wealth effect by discharging their debt, so that there is an offsetting negative wealth effect on labor supply. Thus the predicted effect of filing for bankruptcy on labor supply is actually ambiguous rather than positive. Alternately, suppose debtors have not defaulted but are considering whether to simultaneously default and file for bankruptcy (the model discussed in Section 7.1). Also suppose the fresh start applies in bankruptcy. Then there is no substitution effect of filing for bankruptcy because debtors keep all of their earnings at the margin regardless of whether they file or not. But filing has a positive effect on debtors' wealth that leads to a reduction in their labor supply. Thus the predicted effect of filing for bankruptcy on labor supply depends on the specifics of the model and could be either ambiguous or negative, rather than positive.

Han and Li (2004) used the special bankruptcy survey and other data from the PSID to test whether debtors' labor supply increases when they file for bankruptcy. Their results are only marginally significant, but they found that filing for bankruptcy is not associated with an increase in labor supply—in other words labor supply either falls or remains constant when debtors file. Han and Li's results suggest that the traditional justification for the fresh start does not hold.

8.5. Bankruptcy and the decision to become an entrepreneur

The U.S. personal bankruptcy system functions as a bankruptcy system for entrepreneurs well as for individuals generally. About one in five personal bankruptcy filings in the U.S. list some business debt, suggesting the importance of bankruptcy to small business owners (Sullivan, Warren, and Westbrook, 1989).

Starting or owning an unincorporated business involves incurring business debts for which the firm's owners are personally liable. This means that the variance of entrepreneurs' wealth is high, because it includes the risk associated with their businesses failing or succeeding. The personal bankruptcy system provides partial insurance for this risk

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 52
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

since, if their businesses fail, entrepreneurs can file for personal bankruptcy under Chapter 7 and both their business and personal debts will be discharged. As a result, personal bankruptcy law makes it more attractive for risk-averse individuals to become entrepreneurs by partially insuring their consumption. Further, states that have higher exemption levels provide more insurance because they allow entrepreneurs to keep additional financial assets—perhaps including their homes—when their businesses fail. This means that risk-averse individuals are predicted to be more likely to own or start businesses if they live in states with higher exemption levels.

Fan and White (2003) examined whether households that live in states with higher exemptions are more likely to start or own businesses, using household panel data from the Survey of Income and Program Participation. They focused on the effect of the homestead exemption, since it is the largest and most variable of the bankruptcy exemptions. They estimated separate models of whether homeowners versus renters own businesses, since only homeowners can use the homestead exemption. They found that homeowners are 35% more likely to own businesses if they live in states with high or unlimited homestead exemptions rather than in states with low homestead exemptions, and the difference was statistically significant. They also found a similarly large and significant effect for renters, which suggests that most renters who own businesses expect to become homeowners. Fan and White also found that homeowners are 28% more likely to start businesses if they live in states with unlimited rather than low homestead exemptions, although the relationship was only marginally statistically significant.

8.6. Bankruptcy and credit markets

The model discussed above suggests that bankruptcy exemptions affect the supply and demand for credit. Creditors are predicted to respond to an increase in wealth exemption levels by raising interest rates, reducing the supply of credit, and tightening credit rationing. But individual debtors—assuming they are risk averse—respond to an increase in the exemption level by demanding more credit, because the additional consumption insurance reduces the risk of borrowing. Debtors raise their credit demand because they benefit from having additional consumption insurance even though borrowing becomes more costly. (However the increase in demand may be reversed at high exemption levels, since even risk averse debtors have declining marginal utility from additional insurance.)

8.6.1. General credit

Gropp, Scholz, and White (1997) were the first to examine the effect of variable wealth exemptions on consumer credit. They used household data from the 1983 Survey of Consumer Finances (SCF), which gives detailed information on debts and assets for a representative sample of U.S. households and also asks respondents whether they have been turned down for credit. The GSW study did not distinguish between different types of credit or different types of exemptions, so that their credit variable was the sum of all

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 53
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

types of loans and their exemption variable was the sum of each state's homestead and personal property exemptions.

GSW found that households were 5.5 percentage points more likely to be turned down for credit if they lived in a state with exemptions in the highest rather than the lowest quartile of the exemption distribution. They also found that interest rates were higher in states with higher bankruptcy exemptions, but the effect depended strongly on borrowers' wealth. In particular, households in the second-to-lowest quartile of the wealth distribution paid interest rates that were 2.3 percentage points higher if they lived in high rather than low exemption states, but households in the third and highest quartiles of the wealth distribution paid the same interest rates regardless of the exemption level.

The authors also examined how the amount of debt held by households varies between high versus low exemption states. Although supply and demand for credit cannot be separately identified, a finding that households hold more debt in high-exemption than low-exemption states suggests that the increase in demand for credit more than offsets the reduction in the supply of credit, and conversely. The authors found that in high exemption states, high-asset households held more debt and low-asset households held less. Thus when high-asset households increase their credit demand in response to higher exemption levels, lenders accommodate them by lending more. But when low-asset households increase their credit demand, lenders respond with tighter credit rationing. GSW calculated that, holding everything else constant, a household whose assets placed it in the highest quartile of the asset distribution would hold $36,000 more debt if it resided in a state with combined bankruptcy exemptions of $50,000 rather than $6,000; while a household whose assets placed it in the second-to-lowest quartile of the distribution would hold $18,000 less debt. Thus higher exemption levels were associated with a large redistribution of credit from low-asset to high-asset households.

The results of the study suggest that, while policy-makers often think that high bankruptcy exemptions help the poor, in fact they cause lenders to redistribute credit from low-asset to high-asset households and raise the interest rates they charge low-asset households.

8.6.2. Secured versus unsecured credit

More recent studies of the effect of bankruptcy on credit markets distinguish between secured versus unsecured loans and between different types of exemptions. Secured credit differs from unsecured credit in that, if the debtor defaults, the lender has the right to foreclose on/repossess a particular asset such as the debtor's house or car. The proceeds of selling the house/car go first to repay the secured debt and then the debtor receives up to the amount of the homestead exemption or the exemption for equity in cars, whichever is relevant. Because the secured creditor must be repaid in full before the debtor benefits from the exemption, the terms of secured loans—unlike unsecured loans—are predicted to be unrelated to wealth exemptions.

However in practice, several factors muddy this prediction. First, when debtors default on secured loans, they often file for bankruptcy under Chapter 13 in order to delay

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 54
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

foreclosure or to reduce the principle amount of the loan (for auto loans). Thus bankruptcy filings by debtors increase creditors' collection costs. Since filing for bankruptcy is more attractive in high-exemption states, secured lending is less attractive in these states. Second, secured loans are often partly unsecured, because the market value of the collateral is less than the amount owed. When sale of the collateral brings in too little to repay the debt in full, the secured lender has an unsecured claim for the unpaid portion of the loan and the value of this claim is negatively related to exemption levels. These factors suggest that the market for secured loans may also be affected by exemption levels.

Berkowitz and Hynes (1999) examined whether higher exemptions were related to individuals' probability of being turned down for mortgages, using the Home Mortgage Disclosure Act data. They found that the probability of being turned down for a mortgage was unrelated to exemption levels. Lin and White (2001) examined the effect of higher exemptions on individuals' probability of being turned down for both mortgage and home improvement loans. Home improvement loans make a useful comparison to mortgages, since they are often unsecured or partially secured. Individuals' probability of being turned down for home improvement loans is therefore predicted to be more strongly related to exemption levels than their probability of being turned down for mortgage loans. Lin and White's study used state dummies to control for differences in exemption levels across states in the initial year and year dummies to control for time trends, so that their exemption variables capture only the effect of changes in exemption levels. They found that applicants for both mortgage and home improvement loans were more likely to be turned down in states with higher homestead exemptions. But the effect of exemptions on debtors' probability of being turned down for home improvement loans was both larger and more statistically significant than their probability of being turned down for mortgages. Finally a recent paper by Chomsisengphet and Elul (2005) argues that exemptions have been found to be a significant determinant of whether applicants were turned down for mortgages only because previous researchers did not control adequately for individual applicants' credit quality, which they argue is correlated with exemption levels. But this argument is difficult to evaluate since the HMDA data includes only very limited information about individual applicants. Overall, the question of whether exemption levels affect markets for secured credit remains unresolved.

8.6.3. Small business credit

Since debts of non-corporate businesses are personal liabilities of business owners, the terms of these loans are predicted to be affected by the exemption levels in the debtor's state of residence. In contrast, debts of incorporated businesses are not liabilities of their owners, so that the terms of loans to small corporations are predicted to be unrelated to exemption levels. But in practice, this distinction is not so clear. Creditors who lend to small corporations often require that the owners of the corporation personally guarantee the loan or give lenders second mortgages on their homes. This abolishes the

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 55
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

corporate/non-corporate distinction for the particular loan and suggests that personal bankruptcy law applies to small corporate credit markets as well.

The model discussed above suggests that, in states with high rather than low exemptions, demand for small business credit will be higher and supply of small business credit will be lower. Although it is impossible to separately identify the effects of exemptions on credit supply versus demand, a finding that the amount of credit held by small businesses is lower in high exemption states would suggest that the reduction in supply more than offsets the increase in demand. Berkowitz and White (2004) used data from the National Survey of Small Business Finance to examine how variations in exemption levels affect whether small business owners are turned down for credit and the size and interest rates on loans they receive. They found that for non-corporate and corporate small businesses, the probabilities of being turned down for credit rise by 32% and 30%, respectively, if firms are located in states with unlimited rather than low homestead exemptions. Both relationships are statistically significant. Conditional on receiving a loan, non-corporate businesses paid interest rates that were 2 percentage points higher and corporate firms paid interest rates that were 0.83 percentage points higher if they were located in states with high rather than low homestead exemptions. Both types of firms also received less credit if they were located in states with high rather than low exemptions.

8.7. Macroeconomic effects of bankruptcy

8.7.1. Bankruptcy and consumption insurance

The model discussed above emphasized the insurance role of bankruptcy and the fact that higher exemption levels provide additional consumption insurance. The model predicts that the variance of household consumption in a state-year will be smaller if the state has a higher exemption level. Grant (2005) tested this hypothesis using data from the Consumer Expenditure Survey, a panel survey of U.S. households. For each state-year in his sample, he computed the average variance of household consumption. Then he regressed the change in the average variance of consumption on the state's exemption level, control variables, and state fixed effects. Because the data cover a 20 year period, there are a large number of changes in exemption levels. Grant found that higher exemption levels are associated with lower variance of consumption, i.e., additional consumption insurance.

8.7.2. Bankruptcy and portfolio reallocation

Because unsecured debts are discharged when individual debtors file for bankruptcy under Chapter 7 but some assets are exempt, debtors who contemplate filing for bankruptcy have an incentive to borrow—even at high interest rates—in order to acquire assets that are exempt in bankruptcy. This behavior is referred to as "borrowing to save." The higher the bankruptcy exemption level in the debtor's state, the stronger is debtors'

heslaw v.2007/06/20 Prn:3/09/2007; 15:25 F:heslaw2014.tex; VTEX/VJ p. 56
aid: 2014 pii: S1574-0730(07)02014-2 docsubty: REV

incentive to borrow to save. (Similar types of strategic behavior were discussed above in connection with the proportion of households that would benefit from filing for bankruptcy.)

Lehnert and Maki (2002) examined whether households are more likely to borrow to save if they live in states with higher bankruptcy exemptions. Their definition of borrowing to save is that a household simultaneously holds unsecured debt that would be discharged in bankruptcy and liquid assets that exceed 3% of gross income. The authors tested their model using household-level panel data from the Consumer Expenditure Survey. They found that homeowners were 1 to 4 percent more likely to borrow to save if they lived in states with bankruptcy exemptions that were above the lowest quartile of the exemption distribution. The same relationship was not statistically significant for renters, which is not surprising since exemptions for renters are smaller and less variable.

Overall, the results of the empirical studies suggest that bankruptcy has important and wide-ranging effects on individual behavior. Generous bankruptcy exemptions increase demand for credit by reducing the downside risk of borrowing, but reduce the supply of credit by increasing the probability of default. In states with higher bankruptcy exemptions, individuals are turned down for credit more often and pay higher interest rates. In these states, high asset-households hold more credit, while low asset- households hold less credit—suggesting that high exemptions redistribute credit from low-asset to high-asset households. Small businesses are also affected by personal bankruptcy law. They are more likely to be turned down for credit, pay higher interest rates, and borrow less if they are located in high exemption states. In addition to their effects on credit markets, high bankruptcy exemptions also cause individual debtors to file for bankruptcy more often, become entrepreneurs more often, and reallocate their portfolios toward unsecured debt and liquid assets. Contrary to the presumption of the "fresh start," evidence suggests that individual debtors do not change their work hours significantly when they file for bankruptcy. But higher bankruptcy exemptions benefit risk-averse individuals by reducing risk, since they provide partial consumption insurance.

The empirical work on bankruptcy suggests that the increase in the number of personal bankruptcy filings that occurred over the past 20 years could have been due to a combination of households gradually learning how favorable Chapter 7 is and bankruptcy becoming less stigmatized as filing became more common. How the bankruptcy reforms adopted by Congress in 2005 will affect the number of filings remains a subject for future research.

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Proof of Raw Subject Index

Page: 1016
bankruptcy
bankruptcy
bankruptcy
financial distress
financial distress
corporate bankruptcy
small businesses
small business
bankruptcy
personal bankruptcy
small business
small business
personal bankruptcy
collective framework
financial distress
corporate bankruptcy
reorganization
liquidation
limited liability
absolute priority rule (APR)
APR
APR

Page: 1017
reorganization
liquidation
financial distress
personal bankruptcy
limited liability
personal bankruptcy
exemption
exemption
personal bankruptcy
corporate bankruptcy
APR
corporate bankruptcy
liquidation
personal bankruptcy
Chapter 7
personal bankruptcy
liquidation
human capital
human capital
reorganization
human capital
personal bankruptcy

Page: 1018
financial distress
personal bankruptcy
corporate bankruptcy
consumption insurance
personal bankruptcy
corporate bankruptcy
small business

Page: 1019
corporate bankruptcy
corporate bankruptcy
financial distress
Chapter 7
liquidation
Chapter 11
reorganization
financial distress
Chapter 7
liquidation
Chapter 7
APR
APR
APR
APR
secured
secured
APR
secured
secured
secured
secured
secured

Page: 1020
secured
APR
secured
secured

Chapter 11
Chapter 7
liquidation
secured
liquidation

Page: 1021
Chapter 11
reorganization
financial distress
liquidation
Chapter 7
reorganization
Chapter 11
Chapter 11
reorganization
Chapter 11
reorganization
secured
Chapter 11
Chapter 11
Chapter 11
secured
Chapter 11
Chapter 11
reorganization
reorganization
reorganization
reorganization
reorganization

Page: 1022
reorganization
Chapter 11
reorganization
Chapter 7
reorganization
cramdown
cramdown
reorganization
Chapter 11
Chapter 7
APR
Chapter 11
Chapter 7
Chapter 11
Chapter 7
reorganization
liquidation
reorganization
liquidation
reorganization
Chapter 7
Chapter 11
Chapter 11
reorganization
liquidation
reorganization
liquidation
liquidation

Page: 1023
secured
reorganization
reorganization
liquidation
secured
Chapter 11
Chapter 11
APR
reorganization
reorganization
financial distress
Chapter 11
reorganization
Chapter 11
reorganization
reorganization
reorganization
financial distress
financial distress

Page: 1024
Chapter 11
reorganization
Chapter 11
reorganization
prepack
prepack
prepack
reorganization
corporate bankruptcy

Page: 1025
liquidation
APR
APR
financial distress
liquidation

liquidation

Page: 1026

liquidation
liquidation
APR
liquidation
liquidation
liquidation
APR
liquidation
liquidation
APR
liquidation
liquidation

Page: 1027

liquidation
liquidation
Chapter 11
reorganization
liquidation
Chapter 7
reorganization
Chapter 11
Chapter 11
reorganization
reorganization
Chapter 11
reorganization
reorganization
liquidation
reorganization
liquidation
reorganization

Page: 1028

liquidation
reorganization
option
Chapter 11
reorganization
reorganization
financial distress
APR
APR
Chapter 7
liquidation
APR
Chapter 11
reorganization
APR
APR
APR
APR
APR
Chapter 11
Chapter 7
financial distress

Page: 1029

APR
Chapter 11
reorganization
Chapter 7
liquidation
APR
liquidation
reorganization
option
APR
APR
APR
Chapter 7
Chapter 11
reorganization
Chapter 11

Page: 1030

Chapter 11
reorganization
Chapter 7
Chapter 11
Chapter 11
reorganization
reorganization
reorganization
reorganization
financial distress
reorganization
reorganization
Chapter 11
Chapter 7
reorganization
financial distress
financial distress

Page: 1031

liquidation

Page: 1039

liquidation
reorganization
liquidation
liquidation
reorganization
APR
liquidation
APR
liquidation
reorganization
liquidation
liquidation
financial distress
APR

Page: 1040

corporate bankruptcy
corporate bankruptcy
Chapter 11
corporate bankruptcy
Chapter 11
Chapter 7
Chapter 11
reorganization
Chapter 7
Chapter 11
Chapter 11
Chapter 7
APR
prepack
Chapter 11
prepack
Chapter 11
reorganization

Page: 1041

Chapter 11
Chapter 11
reorganization
Chapter 11
reorganization
absolute priority rule
APR
reorganization
APR
APR
APR
APR
reorganization
APR
reorganization

Page: 1042

reorganization
APR
Chapter 11
APR
reorganization
reorganization
Chapter 11
Chapter 11
reorganization
APR
APR
APR
Chapter 11
secured
secured
secured
APR
APR
secured
secured
secured
Chapter 11
reorganization
APR
secured
Chapter 11
reorganization
Chapter 11

Page: 1043

financial distress
reorganization
financial distress
APR
Chapter 11
APR
Chapter 11
Chapter 11
personal bankruptcy
corporate bankruptcy
personal bankruptcy
corporate bankruptcy
human capital
personal bankruptcy
reorganization

Page: 1061
exemption

Page: 1062
exemption
exemption

Page: 1063
exemption
fresh start
fresh start
exemption
fresh start
fresh start
fresh start
personal bankruptcy
personal bankruptcy
small business
personal bankruptcy

Page: 1064
personal bankruptcy
Chapter 7
personal bankruptcy
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
risk averse
exemption
consumption insurance
consumption insurance
exemption
risk averse
exemption
exemption

Page: 1065
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
secured
secured
secured
exemption
secured
secured
exemption
exemption
secured
exemption
secured
exemption
secured
Chapter 13

Page: 1066
exemption
secured
secured
exemption
secured
exemption
exemption
exemption
exemption
secured
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
exemption
secured
small business
exemption
exemption