CORPORATE AND PERSONAL BANKRUPTCY LAW

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<u>ABSTRACT</u>

Bankruptcy is the legal process by which the debts of firms, individuals, and occasionally governments
in financial distress are resolved. Bankruptcy law always includes three components. First, it provides
a collective framework for simultaneously resolving all debts of the bankrupt entity, regardless of
when they are due. Second, it provides rules for determining how the assets and earnings used to
repay are divided among creditors. Third, bankruptcy law specifies punishments intended to discourage
debtors from defaulting on their debts and filing for bankruptcy. This review discusses and evaluates
bankruptcy law by examining whether and when the law encourages debtors and creditors to behave
in economically efficient ways. It also considers how bankruptcy law might be changed to improve
economic efficiency. The review shows that there are multiple economic objectives of bankruptcy
law, because the law affects has very diverse effects. Some of these objectives differ for individuals
versus corporations in bankruptcy.

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Bankruptcy is the legal process by which the debts of firms, individuals, and occasionally governments in financial distress are resolved. Debtors file for bankruptcy because they cannot pay their debts as they come due and/or because they have liabilities in excess of their assets.

Bankruptcy law always includes three components. First, it provides a collective framework for simultaneously resolving all debts of the bankrupt entity, regardless of when the debts come due. Bankrupts may be required to use some or all of their assets to repay their debts: bankruptcy law includes rules determining which assets must be used to repay versus which assets bankrupts are allowed to keep (if any). Bankrupts may also be required to use some of their future earnings to repay and bankruptcy law provides similar rules determining how much of their future earnings must be used to repay. These rules differ depending on whether bankrupts are corporations, individuals versus governments. Second, bankruptcy law provides rules for determining how the assets and earnings used to repay are divided among creditors. This part of bankruptcy law also includes rules that limit creditors' rights to grab assets and keep them out of the collective debt resolution procedure. Thus bankruptcy law determines both the size of the pie in bankruptcy, i.e., the total amount paid to creditors, and the division of the pie among individual creditors.

Third, bankruptcy law specifies how debtors are punished for filing for bankruptcy. In the U.S. today, the main punishments for bankruptcy are making filers' names public and allowing the bankruptcy filing to remain on their credit records for 10 years. These punishments both stigmatize bankruptcy filers and harm them financially, since they face greater difficulty post-bankruptcy in obtaining loans, renting apartments and sometimes obtaining jobs. In the U.K., punishments include barring bankruptcy filers from managing firms or holding certain public offices for a period of time after filing.[1] Another part of the punishment for bankruptcy is

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[1] There are other punishments for debtors who default but do not file for bankruptcy, including credit collectors calling them, suing them, and garnishing their wages. See below for further discussion. Past punishments for default were far more severe and included the death penalty, exile, selling debtors into slavery, and putting them in debtors' prisons. Early bankruptcy laws also specified severe punishments for filing, including debtor's prison and the death penalty for filers who concealed assets. Debts were discharged only if creditors consented. See Efrat (2002) for multi-country information on punishments for default and bankruptcy. Sandage (2005), Belleisen (2001), and Mann (2002) discuss attitudes toward debt and default in the U.S. and the adoption of U.S. bankruptcy laws—there were several—in the 19th century. Skeel (2001) gives a a history of U.S. personal and corporate bankruptcy law during the 20th century.

whether and when filers' liability to repay is discharged. In the U.S., most bankruptcy filers receive a quick discharge from debt, but in France and Germany, discharges are issued only after debtors use part of their earnings for 5 to 10 years to repay and bankruptcy judges can deny the discharge if they feel that debtors did not try hard enough to repay. In other countries, debt discharge occurs only when the debtor dies. For corporations in bankruptcy, debt is discharged quickly, but the corporation itself ceases to exist.

Bankruptcy procedures may involve either liquidation or reorganization of the bankrupt entity. When corporations liquidate in bankruptcy, all of their assets are sold and the proceeds are used to repay creditors. Assets may be sold piecemeal or as a going concern if the corporation is still operating. The size of the pie in bankruptcy liquidation is all of the corporation's assets. When corporations reorganize in bankruptcy, they keep some or all of their assets, continue to operate, and follow a plan to use part of their future earnings to repay debt. In this situation, the pie includes only part of the corporation's assets, but it also includes part of the corporation's future earnings. For individuals, bankruptcy never involves complete liquidation. Individual bankrupts may be required to give up some of their assets; these are liquidated and the proceeds are used to repay creditors. But individuals' most valuable asset is usually their human capital—their education and training—and the only way to liquidate human capital is to sell individuals into slavery. Since slavery is no longer allowed, bankrupt individuals always keep their human capital and the right to decide whether and how to use it. Thus bankrupt individuals always keep some of their assets. But, like corporations that reorganize, bankrupt individuals may be obliged to use some of the future earnings that their human capital produces to repay creditors, usually for a fixed number of years. This means that bankruptcy procedures for individuals are always reorganizations and the size of the pie used to repay creditors is less than the value of bankrupt individuals' assets.

This review discusses and evaluates bankruptcy law by examining whether and when the law encourages debtors and creditors to behave in economically efficient ways. It also considers how bankruptcy law might be changed to improve economic efficiency. The discussion abstracts from the details of U.S. and other countries' bankruptcy laws in order to focus on common features of bankruptcy law and it also attempts to avoid use of legal terms. The review shows that bankruptcy law has a variety of economic objectives, some of which differ for individuals versus corporations. The variety of economic objectives results from the fact that bankruptcy

law has widespread effects: it affects the supply and demand for many types of credit, it affects which financially distressed firms shut down versus continue to operate, it affects corporate managers' incentives to work hard, invest and take risks, it affects individual debtors' incentives to work hard, become entrepreneurs, take risk, and even to get divorced, it affects competitors of financially distressed firms, and it affects the welfare of debtors' families and neighbors.

Section I discusses research on corporate bankruptcy and section II discusses research on personal and small business bankruptcy.[2] Corporate bankruptcy refers to the bankruptcy of large- and medium-sized firms, which I assume are organized as corporations. Personal bankruptcy refers to the bankruptcies of both individual debtors 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 business debts. When businesses fail, owners often file for personal bankruptcy in order to have their business debts discharged. Even when small businesses are incorporated, owners often guarantee the debts of their businesses, so that personal bankruptcy law applies.

I. Corporate Bankruptcy

Bankruptcy law affects the economic efficiency of corporate behavior, both when corporations are in financial distress and when they are financially healthy.

A. *Effects of Priority Rules in Bankruptcy on Corporate Behavior*

Priority rules are rules for dividing repayment in bankruptcy among creditors and shareholders of a corporation. An important priority rule is the "absolute priority rule" (APR), which requires that unsecured creditors be repaid in full before shareholders receive anything. When there are multiple creditors, priority among them is determined by whether creditors have a secured interest in a particular asset owned by the corporation or by whether creditors have made agreements with the corporation that specify a priority ordering. Suppose a corporation

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[2] For lack of space, governmental ("sovereign") bankruptcy is ignored. Much of the discussion concerns the possibility of establishing a bankruptcy procedure for sovereign default that would have the three characteristics discussed above. See McConnell and Picker (1993), White (2002), and Bolton and Jeanne (2007).

has creditors A and B and A's loan was made before B's. If A's contract with the corporation specifies that its claim will take priority in bankruptcy over the claims of later creditors, then A's claim is paid in full in bankruptcy before B receives anything. Alternately suppose A has a secured claim on the corporation's computer. Then A can take the computer in bankruptcy, which means that A's claim is paid up to the value of the computer before B receives anything. If there is no contractual agreement, then A and B have equal priority in bankruptcy and the APR requires that they be paid the same proportion of their claims. The legal justification for the APR is that it treats creditors in bankruptcy according to the contracts they made with the corporation outside of bankruptcy. "Deviations from the APR" refer to paying positive amounts to lower-priority creditors or shareholders in bankruptcy when higher-priority creditors receive less than full repayment.

Priority rules affect both the size and the division of the pie. Changes in priority among creditors have no effect on the size of the pie, but change the division of the pie. But when creditors receive less than full repayment and shareholders receive positive payment, then deviations from the APR occur and they reduce the size of the pie.

Priority rules affect the economic efficiency of corporate behavior. Consider first how they affect whether corporate managers make economically efficient bankruptcy decisions. Assume that the corporation is in financial distress and managers—representing the interests of shareholders—must choose between filing for bankruptcy versus continuing to operate outside of bankruptcy. The only bankruptcy procedure is liquidation. Corporations in financial distress may be either economically efficient or economically inefficient. They are economically efficient (despite being in financial distress) when the most valuable use of their assets is the current use and they are economically inefficient when their assets are more valuable in some other use. When corporations are economically inefficient, the best outcome is liquidation, since liquidation frees the corporation's assets to move to more valuable uses. Conversely when corporations are economically efficient, the best outcome is for them to continue operating outside of bankruptcy, since this keeps the assets in their current use. Filtering failure occurs when corporations that should liquidate continue to operate or vice versa. Assume that managers and creditors are fully informed about the value of the corporation's assets in both their current and alternate uses.

Suppose the corporation owes a debt of D_A dollars to creditor A which is due in period 1 and a debt of D_B to creditor B which is due in period 2. Total debt D equals $D_A + D_B$. The corporation has no cash on hand. The liquidation value of the assets in period 1 is L and, since $L < D$, the corporation is insolvent. Managers can either file for bankruptcy and liquidate in period 1 or continue to operate the corporation outside of bankruptcy until period 2. In the latter case, assume that the corporation will earn 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.

In order to avoid bankruptcy in period 1, managers must repay creditor A and the only way they can do so is to obtain a new loan from creditor C for the amount $D_C = D_A$. The new loan will be due in period 2. If managers obtain the new loan, the corporation will continue to operate until period 2, when it will shut down and distribute its assets according to the APR. Depending on the terms of creditor B's and C's contracts with the corporation, either creditor could take priority under the APR or they could have equal priority. Assume first that creditor B takes priority, i.e., priority is in chronological order.

In period 1, creditor C and managers are assumed to make the corporation's bankruptcy decision jointly, so that creditor C makes the loan if it and shareholders jointly gain when the corporation continues to operate. If liquidation occurs in period 1, then all of the corporation's assets go to pay creditors and shareholders receive nothing. If creditor C makes the loan and the corporation continues to operate, then creditor C and shareholders together will receive   max[$P_2 - D_B ,0] - D_C$ in period 2. In order for creditor C and shareholders to prefer continuation, this expression must be positive, which implies that $P_2 > D_B + D_C = D$. But since $D > L$, this also means that $P_2 > L$. Thus creditor C and shareholders choose continuation only when it is economically efficient. But they may choose liquidation when continuation is more efficient: this outcome occurs if creditor C and managers choose liquidation because max[$P_2 - D_B ,0]$ $- D_C$ is negative, or if $P_2 < D$, but continuation is economically efficient because $L < P_2$. Thus some efficient corporations liquidate in bankruptcy—an example of filtering failure. This result occurs because choosing continuation increases the amount repaid to creditor B, but managers

and creditor C ignore this gain because they do not share it. Overall, when priority among creditors is in chronological order, too much liquidation occurs in bankruptcy.[3]

Now suppose priority among creditors B and C is reversed, so that it is in reverse chronological order. Then creditor C is more likely to lend and therefore financially distressed corporations are more likely to continue rather than liquidating. But the condition for continuation to be economically efficient remains the same. Thus when priority is in reverse chronological order, fewer economically efficient corporations liquidate in bankruptcy. But now the opposite type of filtering failure may occur, since more inefficient corporations avoid bankruptcy and continue operating.

These examples show that priority rules affect whether filtering failure occurs and may result in either too much liquidation or too much continuation. Too much liquidation is likely when priority among lenders is in chronological order; while too much continuation is likely when priority is in reverse chronological order. The latter result implies that lenders have an incentive to make loans to financially distressed corporations if by doing so they can jump over earlier lenders in the priority ordering.[4]

Now suppose corporations' future earnings are uncertain rather than certain. Suppose the corporation's earnings if it continues to operate until period 2 are $P_2 + G$ or $P_2 - G$, each with .5 probability. Suppose creditor B has priority over creditor C and assume that earnings in the good outcome are sufficient to repay creditor B in full, while earnings in the bad outcome are not. Now if creditor C lends and the corporation continues to operate, creditor C and shareholders' joint expected return in period 2 is $.5(P_2 + G - D_B) - D_C$. Creditor C lends and the corporation continues to operate if this expression is positive, but continuation is economically efficient if $P_2 \geq L$. This means that as the corporation's earnings become more uncertain (G rises), inefficient continuation is more likely to occur. This is because creditor C and shareholders get the additional earnings in the good outcome, but creditor B bears the additional losses in the bad outcome. This result illustrates the fact that corporate managers and shareholders often prefer risky over safe investments even when risky projects offer lower

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[3] This result is an application in bankruptcy of Myers' (1977) "debt overhang" problem. For discussion of the effects of priority rules in bankruptcy, see Bulow and Shoven (1978), White (1980), and Schwartz (1981).
[4] See Bebchuk and Fried (1996) and Stulz and Johnson (1985) for discussion.

expected returns, because shareholders gain disproportionately from risky projects if they succeed. This effect applies both to corporations' bankruptcy decisions and to their investment decisions generally.[5]

Now suppose reorganization is an alternative bankruptcy procedure.[6] Managers of corporations in financial distress are now assumed to choose among continuing outside of bankruptcy, liquidating in bankruptcy, and reorganizing in bankruptcy. When corporations reorganize in bankruptcy, managers are assumed to remain in control at least temporarily and unsecured debt payments are suspended until a reorganization plan is adopted. This temporary debt holiday improves corporations' cash flow and helps them to continue operating. Assume that the reorganization plan requires corporations to pay all creditors a fraction r of their claims in period 2. Also assume that the corporation has only one creditor, creditor E, whose claim of D_E is due in period 1. Because of the debt holiday, the corporation no longer needs a new loan in period 1 to continue operating. If it reorganizes, assume that its earnings will still be $P_2 \pm G$ in period 2, each with 50% probability, and its assets will still be worthless at the end of period 2.

Introducing reorganization allows us to examine the effects of deviations from the APR. Deviations from the APR often occur when U.S. corporations reorganize in bankruptcy, because reorganization plans must be approved by vote of shareholders as well as creditors. Shareholders must therefore receive some payment or else they would vote against the plan.[7] Suppose shareholders are promised a payment equal to a fraction α of creditors' claims, or αD_E. If α is positive, then there are deviations from the APR; higher values of α imply that the payoff rate r to creditors is lower.

If the corporation reorganizes, shareholders' expected return becomes $.5(P_2 + G - rD_E) + .5(\alpha D_E)$, where the two terms represent payments to shareholders in the good

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[5] See Stiglitz (1972) and Jensen and Meckling (1976) for discussion in the non-bankruptcy context.

[6] In the U.S., managers of corporations in bankruptcy generally have the right to choose between reorganization versus liquidation, but in other countries the decision is usually made by a bankruptcy court appointee who also replaces the manager. See Franks, Nybourg, and Torous (1994), White (1996), Berkovitch and Israel (1998), and Franks and Sussman (2005) for comparison of bankruptcy law across countries.

[7] Deviations from the APR can alternately be seen as payments by creditors to prevent shareholders from delaying the reorganization process. See Bebchuk and Chang (1992) for a model and Bebchuk (1998) for discussion of the U.S. reorganization process generally.

and bad outcomes, respectively. Deviations from the APR raise α and lower r, so that they both increase shareholders' expected return and reduce their risk. Because shareholders receive nothing if the firm liquidates in period 1, managers prefer reorganization over liquidation in bankruptcy as long as this expression is positive and they prefer reorganization over continuing to operate the firm outside of bankruptcy since $.5(P_2 + G - rD_E) + .5(\alpha D_E)$ exceeds $.5(P_2 + G - D_E)$. But reorganizing is economically efficient only if $P_2 > L$, and this condition is unaffected by introducing reorganization. Thus introducing reorganization in bankruptcy causes more filtering failure, since more corporations continue to operate, some of which should liquidate.

Introducing reorganization in bankruptcy also affects managers' incentive to choose safe versus risky investment projects. When corporations are in financial distress, suppose the probability of the bad outcome increases in our example from .5 to .9. Shareholders' return thus comes mainly from their payoff of αD_E in the bad outcome. When deviations from the APR are zero, then $\alpha D_E = 0$ and shareholders get nothing in the bad outcome. This means that managers have an incentive to invest in very risky projects (those with high G), because shareholders receive a payoff only when the risky investment project is chosen, it succeeds, and its return $.5(P_2 + G - D_E)$ is large enough to save the corporation. Managers therefore prefer risky projects even when they have low expected returns and are economically inefficient. But deviations from the APR give shareholders a positive return even when the bad outcome occurs and the firm fails, so that managers' incentive to select excessively risky investment projects is smaller. Thus deviations from the APR improve efficiency when corporations are in financial distress by reducing managers' incentive to choose extremely risky investments.[8]

This discussion shows that introducing reorganization as an alternative bankruptcy procedure increases filtering failure by saving more financially distressed corporations when they should be shut down.[9] But the option of reorganizing reduces managers' incentives to

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[8] But deviations from the APR have the opposite effect on managers' incentives when corporations are not in financial distress. See Bebchuk (2002) and Cornelli and Felli (1997) for discussion.

[9] See Wruck and Weiss (1998) for discussion of Eastern Airlines as an example of an inefficient corporation that was saved in bankruptcy reorganization when it should have liquidated. See Lang and Stulz (1992) and Borenstein and Rose (1995) for discussion of the effect of airline bankrupcies on competition in the industry.

invest in excessively risky investment projects when their corporations are financially distressed, so that reorganization has mixed effects on economic efficiency. The discussion also suggests that none of the commonly-used priority rules in bankruptcy always give corporate managers an incentive to make both efficient bankruptcy decisions and efficient investment choices.

B. *Other Effects of Bankruptcy Law: Strategic Default and Managerial Effort*

Now turn to the effect of bankruptcy law on whether corporations default on debt obligations when they are not in financially distress—called strategic default. Suppose there are two types of corporations, solvent versus insolvent. Assume that the most efficient outcome for both types of corporations is to continue operating. Managers of both types of corporations decide whether to repay in full or default. If they default, they offer to pay creditors a fraction of their claims and creditors must decide whether to accept or reject. If creditors accept, then the new debt agreement goes into effect—it is called a "non-bankruptcy workout". If creditors reject, then managers of insolvent corporations file for bankruptcy; while managers of solvent corporations remain out of bankruptcy and repay in full. Because bankruptcy is assumed to be costly, the most efficient outcome is for insolvent corporations to use non-bankruptcy workouts to resolve their financial distress. Solvent corporations should repay their loans in full, because the supply of credit is larger when fewer defaults occur.

Suppose managers of insolvent corporations always default and propose workouts, while managers of solvent corporations may either default or to repay in full. Creditors would like to accept all workout plans offered by insolvent corporations and reject all workout plans offered by solvent corporations. If they could do so, then insolvent corporations would always use non-bankruptcy workouts; while solvent corporations would never default. This outcome would be efficient, because no strategic default and no costly bankruptcy would occur. But models of strategic default assume that there is asymmetric information about corporations' financial status, meaning that managers know whether their corporations are solvent, but creditors do not. Under this assumption, creditors cannot identify individual corporations' types and they must respond in the same way to all workout offers. Creditors have an incentive to accept workout proposals, since bankruptcy costs are assumed to be high and therefore creditors receive little if corporations file for bankruptcy. But they also have an incentive to reject workout proposals in order to discourage strategic default. In equilibrium, creditors reject some or all workout

proposals and this means that at least some insolvent corporations end up in bankruptcy. Asymmetric information thus implies that there will always be either some strategic default or some costly bankruptcy, or a combination of both.[10]

Financial contracting models extend this analysis earlier in time to when creditors and managers first negotiate the terms of their loans.[11] Often these models assume that corporations are just being established, with entrepreneurs that have investment projects but no cash to finance them, and creditors/investors that have cash but no investment projects. Suppose a creditor lends D dollars to an entrepreneur in period 0. In period 1, the project either succeeds or fails. In period 2, it either succeeds and earns a return of $R_2 > D$, or it fails and earns zero. In period 3, it earns R_3 regardless. Also assume that the project's assets have positive liquidation value L in period 2, but are worthless in period 3. Since $R_3 > L$, it is always efficient for the project to continue until period 3, which means that bankruptcies in period 2 are inefficient.

Information is now assumed to be incomplete, but symmetric. All parties are assumed to observe the corporation's return each period, but creditors and entrepreneurs are assumed unable to make a contract based on these returns because they are not verifiable in court. But creditors and entrepreneurs can make enforceable contracts specifying that creditors must receive fixed dollar payments at particular times and they have the right to liquidate the corporation otherwise. Suppose the contract specifies that the entrepreneur will pay creditors D' in period 2; otherwise creditors have the right to liquidate the corporation and collect L. Under this contract, entrepreneurs never default strategically: they repay D' in period 2 if the project succeeds and default if it fails. Entrepreneurs repay in period 2 whenever they can, since they gain from retaining control of the corporation and collecting R_3 in period 3. The contract does not call for entrepreneurs to pay anything to investors in period 3—any obligation by entrepreneurs to pay in period 3 is unenforceable because the corporation has zero liquidation value and therefore investors cannot punish entrepreneurs for defaulting.

This type of contract eliminates strategic default, but causes some bankruptcies to occur in period 2. This is because creditors liquidate corporations that default in period 2, even though liquidation is inefficient. Otherwise, managers would have an incentive to strategically default.

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[10] See Schwartz (1993), Gertner and Scharfstein (1991), and White (1994) for discussion.
[11] See Hart and Moore (1998) and Bolton and Scharfstein (1996) for discussion.

Investors alternately might play mixed strategies and only sometimes liquidate corporations that default—this reduces bankruptcy but causes some strategic default to occur. Thus when information is incomplete, 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 (1996) extend the 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 each individual creditor has the right to liquidate the corporation following default, so that strategic default only succeeds if no creditor liquidates 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. Creditors holding short-term versus long-term debt have differing stakes in the corporation, since only those holding long-term debt benefit from its future earnings. As a result, short-term creditors are more likely to liquidate following default. Berglof and von Thadden show that entrepreneurs are less likely to default strategically if some of the corporation's creditors hold only short-term debt.[12]

Other papers consider how bankruptcy law affects whether entrepreneurs use the economically efficient level of effort in managing their corporations. Povel (1999) develops a model to analyze how bankruptcy law affects the tradeoff between entrepreneurs' effort levels and whether the number of bankruptcy filings is efficient. In his model, corporations may have either high or low earnings. The best outcome is for them to file for bankruptcy when earnings are low and to avoid bankruptcy when earnings are high. Entrepreneurs make the bankruptcy decision. They also decide whether to use high or low effort, where high effort increases the probability of high earnings. But creditors cannot observe entrepreneurs' effort levels and they also do not observe a signal that arrives concerning the project's quality.

There are two possible bankruptcy laws: "soft" versus "tough," corresponding to reorganization versus liquidation in bankruptcy. Entrepreneurs are assumed to keep their jobs under the soft bankruptcy law and lose them under the tough bankruptcy law.

When bankruptcy law is soft, Povel shows that entrepreneurs file for bankruptcy whenever the signal suggests that earnings are likely to be bad, since they are treated well in bankruptcy.

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[12] See also Webb (1987), Bester (1994), and Hart and Moore (1998).

But because they have a soft landing in bankruptcy, they use less effort. In contrast, when bankruptcy law is tough, entrepreneurs avoid bankruptcy regardless of the signal, since filing for bankruptcy costs them their jobs. But then they have an incentive to use high effort in order to increase the probability that earnings will be high. Thus filtering failure trades off against entrepreneurs' effort level: a tough bankruptcy law results in too many bankruptcies but efficient effort by entrepreneurs; while a soft bankruptcy law results in the opposite. Depending on whether efficient effort by entrepreneurs or efficient levels of filtering failure is more valuable, either a soft or a tough bankruptcy law could be more economically efficient.[13]

To summarize, theoretical models of bankruptcy law show that bankruptcy affects managers' incentive to use effort, to default strategically, to file for bankruptcy at the efficient time, and to make efficient investment decisions. The models consider both the effects on economic efficiency of changing the priority rules in bankruptcy and changing bankruptcy law in other ways. The results show that, except in special cases, no one bankruptcy procedure results in economically efficient outcomes along all the dimensions considered.

C. *Proposed Reforms of Bankruptcy Law—Auctions, Options, and Bankruptcy by Contract*

A number of authors have argued that the procedure for reorganizing corporations in bankruptcy in the U.S. should be reformed to eliminate deviations from the APR and reduce filtering failure. More specifically, the argument is that reorganization in bankruptcy sets up a negotiation between managers and creditors that over-values corporate assets, which results in deviations from the APR occurring and inefficient corporations being saved. The reform proposals advocate substituting market-based methods to value corporate assets in bankruptcy, so that the APR is followed (without deviations). They also argue that old managers should not be allowed to decide whether corporations in bankruptcy shut down or continue to operate.

As an example of how inaccurate valuations lead to deviations from the APR, suppose the true value of a corporation's assets is $8 million and it has $8 million in high-priority claims and

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[13] Berkovitch, Israel and Zender (1997) explore how bankruptcy law affects managers' incentives to invest in firm-specific human capital and Berkovitch and Israel (1999) explore whether creditors or entrepreneurs should have the right to initiate bankruptcy. Triantis (1993) explores how bankruptcy law affects the efficiency of buyers' and sellers' incentives to breach contracts and to make reliance investments.

$4 million in low-priority claims. If the assets are valued at $8 million or less, then high-priority creditors receive all of the assets of the reorganized corporation, while low-priority creditors and the firm's old shareholders receive nothing. But if the assets instead are valued at, say, $14 million, then high-priority creditors receive only $8 million/$14 million = 57% of the assets, low-priority creditors receive 29%, and old shareholders receive 14%. Thus a high valuation leads to deviations from the APR. In the U.S., negotiations over reorganization plans in bankruptcy frequently use inflated valuations, because the voting procedure for adopting a reorganization plan requires that low-priority creditors and old shareholders vote in favor, and they only do so if they receive some payment. But if a reorganization plan is adopted, then the corporation continues to operate even if it is inefficient.

1. *Auctions.*

One reform proposal is to auction all corporations in bankruptcy.   If corporations are operating when they file, 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, without deviations. The winner of the auction—rather than the old managers—would decide whether to continue to operate the corporation or shut down. Auctions would eliminate the distinction between reorganization and liquidation in bankruptcy.

Auctions have a number of advantages. They would improve economic efficiency by allowing new buyers to decide whether distressed corporations liquidate or reorganize.   While managers and old shareholders always prefer reorganization, buyers have an incentive to make economically efficient choices because they have their own funds at stake.   Using auctions would also eliminate the over-valuation of corporate assets, since all valuations would be market-based. The reorganization process would be also be quicker and less costly, since there would be no need to negotiate and vote on reorganization plans. [14]

But a number of problems with bankruptcy auctions have been noted. One is that, if few bankrupt firms are auctioned, then buyers may assume that they are lemons and respond with

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[14] See Baird (1986), (1987) and (1993), Roe (1983), Jackson (1986), Shleifer and Vishny (1992), Gertner and Picker (1992), Berkovitch, Israel and Zender (1997) and (1998), Baird and Rasmussen (2002) and LoPucki (2003) for arguments in favor and against using auctions in Chapter 11.

low bids. This problem may become less severe as more auctions occur. Another is that auctions may increase market power in an industry, since the most likely buyers for assets of bankrupt corporations are other firms in the same industry.   Finally and most importantly, the theoretical models discussed above do not support the idea that strict application of the APR in bankruptcy reorganization increases efficiency. Instead, using the APR without deviations may result in too much liquidation occurring, rather than too much reorganization.

2. Options.

Bebchuk (1988) and (2000) proposed using options to value the assets of corporations in bankruptcy and eliminate deviations from the APR. To illustrate, suppose a bankrupt firm has 100 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 shareholder is given an option to purchase the interests of a creditor for \$1. Options must be exercised at a particular date. If shareholders think that their shares will be worth less than \$1, then they will not exercise their options.   Then the debt is converted into shares in the reorganized corporation, so that each creditor ends up with one share of the reorganized firm worth less than \$1 and old shareholders receive nothing. But if shareholders think that their shares will be worth more than \$1, then they will exercise their options.   Each creditor then ends up with \$1 and each shareholder ends up with 1 share of the reorganized firm minus \$1. A market for the options would operate before the exercise date, so that creditors and shareholders would have a choice between exercising their options or selling them to outside investors.   Regardless of whether the options are exercised, the APR is followed. This is because regardless of who ends up owning the shares, the old shareholders receive nothing unless the creditors are repaid in full. The same procedure can be extended to multiple classes of creditors, where each class of creditors is given options to purchase the claims of the next highest class of creditors.

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 shareholders elect a board of directors that hires 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 shareholders 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 shares or simply offers to manage the firm with the new shareholders 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 in deciding whether to exercise their options. After the options are exercised, new shareholders would vote to determine which bid is selected.

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. Debtors and creditors are not allowed to contract for any alternative dispute-resolution procedure or for any limits on managers' right to file for bankruptcy and to choose between liquidation and reorganization in bankruptcy. They also cannot contract out of use of the APR in bankruptcy liquidation. 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 reject the default rules by agreeing on alternatives. A number of authors have argued that efficiency would be enhanced if creditors and debtors could choose their own bankruptcy procedure, with the choice being made when they negotiate their debt contracts. This argument makes sense in light of the contracting models discussed above, which show that the most economically efficient bankruptcy procedure may vary depending on circumstances. For example, in the Povel (1999) model discussed above, the most economically efficient bankruptcy law could be either soft or tough, depending on circumstances. [15]

The most radical approach to bankruptcy contracting was suggested by Adler (1993), who proposed completely abolishing bankruptcy. Instead, debt contracts would incorporate a procedure to deal with financial distress, which Adler calls "chameleon equity." If a corporation became insolvent, its lowest-priority debt claims would be converted to equity and old equity would be eliminated. If the corporation was still insolvent, the next-higher-priority debt claims would be converted into equity and lower-priority debt claims would be eliminated. The process would continue until the corporation is solvent again. These changes would preserve the APR. Creditors would no longer have the right to sue corporations for repayment following default. As an example, suppose a corporation's assets are worth $1,000,000, but it is insolvent because it

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[15] Other contracting models discussed above also consider optimal bankruptcy law.

has $900,000 in senior debt and $500,000 in junior debt. Then the senior debt would remain intact, the junior debt would be converted into equity and the old equity would be eliminated.

The proposal has a number of obvious problems. The most important is strategic default, since managers would gain from invoking the procedure and getting rid of the corporation's debt. The lack of a penalty for default would undermine credit markets and greatly reduce credit availability. In addition, inefficient corporations would never be forced to shut down, since they could always convert their debt to equity. Overall, the proposal suggests the importance of having a mandatory bankruptcy procedure. While it might improve efficiency to allow debtors and creditors to contract about specifics of bankruptcy, it would not improve efficiency to eliminate bankruptcy completely.

Schwartz (1997) considers a model in which bankruptcy reorganization retains its current form, but debtors and creditors can contract in advance to change specific aspects of the law. In particular, creditors could contract in advance to pay shareholders a pre-determined amount if managers choose liquidation rather than reorganization in bankruptcy. In effect, this means that the parties could contract in advance to deviate from the APR in bankruptcy. All other aspects of bankruptcy law would remain unchanged.

Schwartz shows that this type of contract can reduce filtering failure by reducing the number of corporations that reorganize in bankruptcy when they should liquidate. This is because the pre-determined payment causes managers of inefficient corporations to change their preferences from liquidation to reorganization; while managers of efficient corporations still prefer reorganization since it generates a larger return than the pre-determined payment. But the result is somewhat fragile, since if the pre-determined payment is too high, then even managers of efficient corporations will prefer liquidation over reorganization. Thus allowing contracting over some aspects of bankruptcy law can sometimes improve economic efficiency relative to the current mandatory bankruptcy regime.

4. Financial crises and "systemic" bankruptcy

The previous discussion assumes that bankruptcies occur in isolation. However in a financial crisis, many corporations experience financial distress simultaneously because credit becomes unavailable or interest rates drastically increase. Many of the corporations that become financially distressed during financial crises would be profitable in normal conditions. In this

situation, the main goal of bankruptcy policy changes from that of reducing filtering failure to that of keeping financially distressed corporations in operation, since shutdown spreads economic disruption and worsens the severity of the crisis. Stiglitz (2001) and Miller and Stiglitz (2010) discuss the possibility of a "super Chapter 11" bankruptcy procedure that would be put into effect during financial crises. It would keep financially distressed corporations operating by speeding up bankruptcy procedures, retaining existing managers, and converting corporate debt into equity. This type of procedure would also reduce the need for government-financed bailouts of distressed corporations in times of financial crisis and provide governments with an additional tool for stabilizing the economy.[16]

D. *Empirical Research on Corporate Bankruptcy*

Empirical research on corporate bankruptcy has concentrated on measuring the costs of bankruptcy and the size and frequency of deviations from the APR.[17]

1. *Bankruptcy costs*

Bankruptcy costs can be divided into direct versus 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, loss of key employees, reduced access to capital, and investment opportunities foregone because managers' time is spent on the bankruptcy. Weiss (1990) studied 37 corporate reorganizations during the early 1980's and found that the direct costs of bankruptcy averaged 3.1% of the combined value of debt plus equity. Bris et al (2006) found that bankruptcy costs were similar in liquidations versus reorganizations. Indirect bankruptcy costs are not reported and must be inferred, but are likely to be much greater than direct bankruptcy costs. White (1983) solved for upper bound expressions on indirect bankruptcy costs; her results suggest that indirect costs may be as high as twenty times the direct costs of bankruptcy. Other studies provide evidence that that bankruptcy is very

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[16] Chapter 11 is the U.S. bankruptcy procedure for saving financially distressed corporations. See Claessens et al (2001) and Halliday and Carruthers (2009) for discussion of corporate bankruptcy procedures in the context of the Asian financial crisis and the 2008 financial crisis.
[17] There is little empirical research on the effect of bankruptcy law on credit markets for large corporations. But see Davydenko and Franks (2008), which uses cross-country data. I discuss this topic in detail in the next section.

disruptive to corporations, which implies that indirect bankruptcy costs must be very high. Ang and Chua (1981) and Gilson (1990) found that the turnover rates of top executives and directors were much higher for large corporations that reorganized in bankruptcy than for corporations not in bankruptcy. Carapeto (2000) found that when large corporations in bankruptcy offer multiple reorganization plans, the total payoff offered to creditors 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 reorganizing in bankruptcy 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 suggest that some inefficient firms are reorganizing in bankruptcy even though they should liquidate.[18]

2. Deviations from the Absolute Priority Rule.

Several papers provide evidence concerning the frequency and size of deviations from the APR in corporate reorganizations. The size of deviations from the APR is measured by the amount paid to equity in violation of the APR divided by the total amount distributed to creditors under the reorganization plan. For example, suppose a corporation in bankruptcy owes $1,000,000 to creditors, but its reorganization plan pays creditors $500,000 and gives old shareholders $50,000. Then deviations from the APR amount to $50,000/500,000 or 10%.

Weiss (1990) examined 31 corporations that adopted reorganization plans in bankruptcy, of which 28—or 90%--involved deviations from the APR. Eberhart et al (1990), LoPucki and Whitford (1990), Betker (1995) and Carapeto (2000) similarly found deviations from the APR in around three-quarters of large corporations' bankruptcy reorganization plans. Eberhart et al (1990) and Betker (1995) found that the average deviation from the APR was in the range of 3% to 7%.

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 was always perfectly followed, the estimated relationship would run along the horizontal axis as long as the payoff rate to unsecured creditors was less than 100%, but would become vertical at a payoff rate of 100%.

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[18] See also Ang et al (1982), LoPucki (1983), and Franks and Torous (1989).

But when there are deviations from the APR, shareholders are likely to receive something even when unsecured creditors' payoff rate is low and their payoff is likely to increase quickly as unsecured creditors' payoff rate approaches 100%.

This relationship has been estimated by White (1989), Betker (1995) and Bris et al (2006). As predicted, the results show that shareholders receive a minimum payoff of about 5 percent of unsecured creditors' claims and that their payoff rate increases as unsecured creditors' payoff rises.[19] Betker also finds that deviations from the APR are smaller when a higher proportion of the firm's debt is secured. Bris et al (2006) also find that deviations from the APR are larger when managers own more equity in the corporation.[20]

II. Personal Bankruptcy

Like corporate bankruptcy law, personal bankruptcy law determines both the total amount that individual debtors must repay—the size of the pie—and how the pie is divided among creditors.   A larger pie benefits future borrowers by increasing the future supply of credit and lowering interest rates. But a larger pie is costly to existing debtors, since high repayment obligations may reduce debtors' consumption to the point that illnesses go untreated and turn into disabilities, debtors' families lose their homes and their neighborhood ties, and debtors' children leave school in order to work. High repayment obligations may also cause debtors to work less and may change their decisions concerning whether to whether to consume versus invest their wealth and whether to choose safe versus risky investments.   The division of the pie also has efficiency implications. When debtors default, creditors have an incentive to race against each other to be first to collect, because bankruptcy filings terminate collection efforts. But aggressive collection efforts can harm debtors, since they may quit their jobs if creditors garnish wages or lose their jobs if creditors repossess their cars.

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[19] These results are also 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 corporation comes closer to being in the money.

[20] Gilson et al (1990), Tashjian et al (1996) and Morrison (2009) provide empirical evidence comparing out-of-bankruptcy workouts to in-bankruptcy reorganizations.

Some of the economic objectives of personal versus corporate bankruptcy are the same, but there are important differences. Because individuals in bankruptcy never liquidate, there is no issue of filtering failure in personal bankruptcy. Also, an important objective of personal bankruptcy law that does not exist in corporate bankruptcy is to provide partial consumption insurance to bankrupts. Bankruptcy-provided consumption insurance makes individuals worse off when their ability-to-repay is high and better off when their ability-to-repay is low.

Personal bankruptcy law specifies a set of exemptions that determine how much of their financial wealth and future earnings individual bankrupts are allowed to keep. Exemptions exist only in personal bankruptcy; as discussed above, there are no bankruptcy exemptions for corporations.[21] Although higher exemption levels reduce the size of the pie, they benefit debtors by raising their minimum consumption levels. Exemptions also affect debtors' incentives to work and use their human capital after bankruptcy.

A. Insurance and Work Effort Effects of Personal Bankruptcy Law [22]

Most models of economically efficient personal bankruptcy law solve for optimal bankruptcy exemption levels, i.e., the optimal size of the pie. They ignore the question of how the pie should be divided by assuming that bankrupts have only one creditor. Suppose there is only one personal bankruptcy procedure which obliges bankrupts to repay from both financial wealth *and* post-bankruptcy earnings, but provides exemptions for both. (These assumptions differ from U.S. bankruptcy law, where most commonly-used personal bankruptcy procedure exempts all future earnings from the obligation to repay—this is referred to as the "fresh start."[23]) Not assuming that all future wages are exempt allows us to consider whether/when the fresh start is economically efficient.

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[21] Corporations that reorganize in bankruptcy are allowed to keep some of their assets, but the justification is that these corporations will pay creditors more from their future earnings than creditors would receive in liquidation.

[22] This section draws on Rea (1984), Jackson (1986), White (2005), Fan and White (2003), Wang and White (2000), and Adler, Polak, and Schwartz (2000). Rea (1984) was the first to suggest the insurance justification for personal bankruptcy law. See Livshits, MacGee and Tertilt (2007) and Athreya (2002) for models of the macroeconomic effects of personal bankruptcy law.

[23] The U.S. bankruptcy procedure that exempts all future earnings is Chapter 7, while the procedure that requires individual bankrupts to use future earnings to repay is Chapter 13. Since 2005, some higher-income bankrupts have been barred from filing under Chapter 7. See White (2007) for discussion of bankruptcy reform.

Assume that the wealth exemption in bankruptcy is X dollars, regardless of the form of the wealth, and the exemption for future earnings is x percent of post-bankruptcy earnings.[24] Debtors are obliged to repay from earnings for a fixed number of years. Filing for bankruptcy cost debtors S dollars. Debtors in bankruptcy are required to use all of their non-exempt wealth and earnings to repay pre-bankruptcy debt, up to the amount owed. Whatever debt is unpaid at the end of the repayment period is discharged.

Suppose in period 1, individuals borrow a fixed amount B at interest rate r from a single lender, to be repaid in period 2. The interest rate is determined by the lender's zero profit constraint. In period 2, wealth is uncertain. Individual debtors learn their actual wealth at the beginning of period 2, they then decide whether to file for bankruptcy, and, finally, they choose their period 2 labor supply. Period 2 labor supply depends on whether they file for bankruptcy. (Period 2 is assumed to last for the entire period when they are obliged to repay in bankruptcy.)

Individuals' utility depends positively on consumption and negatively on labor supply in each period and they are assumed to be risk averse. They have an incentive to work less after filing for bankruptcy because their earnings are subject to the "bankruptcy tax" of x%. But they also have an incentive to work more after filing, because bankruptcy reduces their wealth. Economists generally assume that the former effect exceeds the latter (the substitution effect exceeds the wealth effect), so that individuals are predicted to work less following bankruptcy.

Debtors decide whether to file for bankruptcy depending on which alternative maximizes their utility. There is a threshold level of period 2 wealth $\hat{W}$ where they are indifferent between filing versus not filing; they file if their wealth is below the threshold and do not file otherwise. When debtors' earnings are higher, the threshold wealth level rises. Figure 1 shows debtors' period 2 consumption as a function of their period 2 wealth. Consumption is divided into three regions: region 3 where debtors repay in full; region 2 where they file for bankruptcy and repay from both wealth and future earnings; and region 1 where they file for bankruptcy and repay only from future earnings, since all of their wealth is exempt. The boundary between regions 2 and 3 occurs at $\hat{W}$. There is a discontinuous drop in consumption at $\hat{W}$ because debtors work less and earn less in bankruptcy.

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[24] Hynes (2002) discusses alternate ways of taxing debtors' post-bankruptcy earnings.

How do the wealth and earnings exemptions provide debtors with consumption insurance? Raising the wealth exemption X reduces debtors' consumption in region 3 because creditors raise interest rates on loans, but increases debtors' consumption in region 2 because more of their wealth is exempt. Consumption is unaffected in region 1 because all of debtors' wealth is exempt. In contrast, raising the earnings exemption reduces debtors' consumption in region 3 for the same reason, but increases debtors' consumption in both regions 2 and 1 because they keep a higher percent of their earnings. This means that the consumption insurance provided by a higher earnings exemption is more valuable than the consumption insurance provided by a higher wealth exemption, because only a higher earnings exemption raises debtors' consumption in region 1 where it is lowest. In addition, debtors work more following bankruptcy when the earnings exemption is higher, because their earnings are less highly taxed. Debtors therefore repay more in bankruptcy when x is higher, which reduces the cost of consumption insurance.

These results suggest that optimal personal bankruptcy law should have a relatively high exemption for earnings and a relatively low exemption for wealth, both because the earnings exemption provides more valuable consumption insurance and because a higher earnings exemption causes debtors to work more in bankruptcy. The higher value of the earnings exemption relative to the wealth exemption suggests an economic justification for the "fresh start."[25]

This model of bankruptcy yields several testable hypotheses. First, in jurisdictions that have higher wealth exemptions in bankruptcy, consumption is more fully insured and therefore is predicted to be less variable. Second, in jurisdictions that have higher wealth exemptions, lending is less profitable because default rates are higher. Therefore lenders are predicted to charge higher interest rates and reduce the supply of credit. Third, if debtors are risk averse, then they are predicted to borrow more when the downside risk of borrowing is lower. This means that demand for credit is predicted to be higher in jurisdictions with higher wealth exemptions. Similarly, if potential entrepreneurs are risk averse, then they are more willing to take the risk of going into business if higher wealth exemptions reduce the cost of business failure. Jurisdictions

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[25] See Wang and White (2000) for a simulation. The earnings exemption would not necessarily provide more valuable consumption insurance if a range of low earnings were entirely exempt in bankruptcy, since earnings in this range would be unaffected by the exemption level.

with higher wealth exemptions are therefore predicted to have more entrepreneurs. These predictions have been tested—see below.

B. Other Theoretical Issues

1. Default versus bankruptcy.

In the previous section, debtors were assumed to choose between defaulting and filing for bankruptcy versus repaying in full. But in reality, debtors may default without filing for bankruptcy or default first and file for bankruptcy later. When debtors default, creditors attempt to collect and their most important legal weapon is garnishment of a fraction of debtors' earnings. Debtors often respond to garnishment by filing for bankruptcy, since filing ends garnishment.

White (1998b) used an asymmetric information model to examine whether, in equilibrium, debtors may default but not file for bankruptcy. The model assumes that there are two types of debtors, A's and B's. Both types decide whether to default, and, following default, creditors decide whether to garnish debtors' wages. Garnishment is assumed to be costly for creditors. The two types of debtors differ in how they respond to garnishment: type A's repay in full, while type B's file for bankruptcy and repay nothing. Creditors are assumed unable to identify individual debtors' types when they default, so they must respond in the same way to all defaults. I show that, in equilibrium, all type B debtors default, at least some type A debtors also default, and creditors play mixed strategies of sometimes instituting garnishment in response to default and sometimes not. This means that, in equilibrium, some debtors default but do not file for bankruptcy. These debtors obtain the benefit of debt forgiveness without having their wages garnished and without filing for bankruptcy. The model suggests that having a personal bankruptcy system encourages some debtors to default even when they can afford to repay their debts.

2. Waiving the right to file for personal bankruptcy

In the corporate bankruptcy context, researchers have argued that debtors should be allowed to contract with creditors about bankruptcy procedures (see the discussion above). In the

personal bankruptcy context, the issue is whether efficiency could be improved by allowing debtors to waive their right to file for bankruptcy.[26]

Would individual debtors ever choose to issue waivers when making loan contracts? Doing so would mean that debtors could still default, but they could not end creditors' collection efforts by filing for bankruptcy. The main advantage to debtors of issuing waivers is that more credit would be available at lower interest rates, because debtors are less likely to default. But debtors who issued waivers would face more risk in their period 2 consumption, i.e., consumption would be higher in region 3 of figure 1 and lower in regions 1 and 2. Debtors who issued waivers would probably work more in order to reduce their risk. This suggests that risk-averse debtors would not issue waivers, but risk-neutral debtors might.

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's wealth turns out to be low, but debtors may not take this into account in deciding whether to issue waivers. Also, debtors may underestimate the probability of having low wealth in the future, so that they may issue waivers 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.[27] Finally, allowing waivers might have adverse macroeconomic effects. This is because if many debtors simultaneously had a bad draw on wealth, all would reduce their consumption simultaneously and the economy might go into a recession.

3. *The option value of bankruptcy.*

Debtors' right to file for bankruptcy can be expressed as a put option. If debtors' future wealth turns out to be high, they repay their debts in full; but if their future wealth turns out to be low, they can exercise their option to "sell" the debt to creditors by filing for bankruptcy. The price of exercising the put option is the cost of filing plus the amount that debtors are obliged to

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[26] In the U.S., waivers are unenforceable and the rules of bankruptcy cannot be changed by contract. See Rea (1984), Jackson (1986), Adler, Polak and Schwartz (2000), and Hynes (2004) for discussion.

[27] Posner (1995) discusses the relationship between the insurance provided by bankruptcy and government-provided social insurance programs.

repay in bankruptcy.   Also, because debtors in the U.S. can only file for bankruptcy once every six years, they gain from timing their bankruptcy decisions.

White (1998a) calculated the value of the option to file for bankruptcy for a representative sample of U.S. households during the early 1990's. The results showed that at the time, many more households had a positive option value of filing for bankruptcy than actually filed.

4. Bankruptcy and incentives for strategic behavior

A problem with personal bankruptcy law—particularly in the U.S.—is that it may encourage debtors to behave strategically by filing even when they can afford to repay their debts. Strategic behavior by debtors undermines the goal of punishing debtors for bankruptcy.   In general, the higher are the wealth and earnings exemptions in bankruptcy, the stronger are debtors' incentives to behave strategically. In the U.S., post-bankruptcy earnings are completely exempt for most debtors and some U.S. states also have high or unlimited exemptions for wealth. As a result, many debtors in the U.S. gain from behaving strategically. Using the previous notation and assuming that the earnings exemption is 100%, debtors' financial benefit from filing for bankruptcy is:

$$Financial\ benefit = max\{D - max[W - X, 0], 0\} - S \qquad (1)$$

Here D 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, if any, and S is the cost of filing.

White (1998a and 1998b) calculated the financial benefit of filing for bankruptcy for a representative sample of U.S. households. Bankruptcy costs were assumed to be zero.   The results showed that approximately one-sixth of U.S. households would benefit from filing for bankruptcy.   If debtors pursued various strategies to increase their financial gain from filing, then the proportion that benefited from bankruptcy rose from one-sixth to one-half. These results provide some explanation for why the U.S. has high bankruptcy filing rates, but raise the opposite question of why filing rates aren't even higher.

C. Empirical Research on Personal and Small Business Bankruptcy

Most of the empirical research on personal bankruptcy uses U.S. data and makes use of the fact that exemption levels for wealth vary widely across U.S. states. (Other aspects of U.S. bankruptcy law are uniform across states.)[28] This variation allows researchers to investigate how differences or changes in wealth exemptions across states affect a variety of behaviors by debtors and creditors. The studies include research both on how bankruptcy law affects behavior and on the determinants of bankruptcy filings. In this section, I review empirical research on both personal and small business bankruptcy.

1. Bankruptcy law as insurance for consumption and wealth.

The model discussed above showed that higher exemption levels provide debtors with additional insurance against negative financial shocks that would reduce their wealth and their consumption levels. This is because when negative shocks occur, debtors living in states with higher exemption levels can have their debts discharged in bankruptcy while keeping more of their assets. This means that the variance of household consumption over time in particular U.S. states should be smaller, i.e., less risky, in states with higher exemption levels. Grant and Koeniger (2009) tested this hypothesis by computing the variance of household consumption by state-year for all U.S. states over a 20 year period. Then they estimated a regression explaining the change in the variance of consumption as a function of exemption levels by state-year, plus control variables. They found that in states with higher exemption levels, changes in the variance of consumption were lower, thus supporting the hypothesis that higher exemption levels provide households with additional consumption insurance.

2. Insurance effects of bankruptcy: entrepreneurial behavior, divorce, and health insurance

When individuals start or own unincorporated businesses, they incur business debts for which they are personally liable. This makes entrepreneurs' wealth more risky, because wealth

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[28] The U.S. bankruptcy reform of 1978 adopted uniform exemption levels for wealth in bankruptcy, but allowed states to opt out of the Federal exemptions and choose their own. All states did so by around 1980, but around one-third of the states allow bankruptcy filers to choose between the state and the Federal exemption levels. Other aspects of bankruptcy law are uniform across states, because the U.S. Constitution reserves for the Federal government the right to adopt bankruptcy laws. See Posner (1997) for discussion of the history and political economy of the 1978 reform. Hynes, Malani and Posner (2003) estimate a model that explains states' exemption levels.

increases if the business succeeds and falls if it fails. The personal bankruptcy system provides partial insurance for this type of risk since, if failure occurs, entrepreneurs can file for personal bankruptcy and have both their business and personal debts discharged. States that have higher wealth exemptions provide even more wealth insurance through bankruptcy; in those with the highest exemptions, entrepreneurs can keep their homes even if their businesses fail. Thus risk-averse individuals are predicted to be more likely to own or start businesses if they live in states with higher wealth exemptions.

Fan and White (2003) tested this hypothesis, focusing on home equity exemptions—which are the largest exemptions in most U.S. states. They found that homeowners are 35% more likely to own businesses if they live in states with high or unlimited home equity exemptions rather than low exemptions. They also found a similar effect for renters. Armour and Cumming (2008) found similar results using data for 15 countries in Europe and North America.

The additional wealth insurance provided by bankruptcy in states with higher exemption levels also affects behavior in other ways. Being married provides individuals with insurance against negative financial shocks, because shocks are unlikely to affect both spouses at the same time. But the insurance provided by marriage is less valuable to individuals living in states with higher exemption levels, because bankruptcy in these states provides more of the same type of insurance. Couples in these states therefore gain less from marriage and have stronger incentives to get divorced. Traczynski (2010) tests the divorce hypothesis and finds that increases in state exemption levels from 1989 to 2005 resulted in 200,000 additional divorces during the period. Similarly, individuals have less incentive to buy health insurance if they live in states with higher exemption levels. Having health insurance provides them with financial protection against negative medical shocks, but the insurance is less valuable if they live in states with higher exemption levels because bankruptcy provides more of the same type of insurance. Mahoney (2011) shows that individuals are less likely to buy health insurance if they live in states with higher exemption levels.

3. Effects of bankruptcy on post-bankruptcy labor supply

In the theoretical model discussed above, debtors were predicted to work less after filing for bankruptcy if they are required to repay debt from future earnings. However U.S. law differs from the assumptions of the model discussed above, because most bankruptcy filers are not

required to repay from post-bankruptcy earnings, but are often subject to wage garnishment outside of bankruptcy.   This means that filing for bankruptcy reduces rather than increases their obligation to repay debt from earnings and, as a result, they are predicted to work *more* after filing. Han and Li (2007) examined empirically how filing for bankruptcy affects debtors' labor supply. They found that debtors did *not* increase their labor supply after filing for bankruptcy. Their results thus undermine the argument that debtors should have a "fresh start" in bankruptcy (a 100% exemption for post-bankruptcy wages), because the fresh start does not increase debtors' post-bankruptcy work effort.

4.   *What Triggers Bankruptcy?*

The model discussed above implied that debtors are more likely to file for bankruptcy when their financial benefit from filing is higher. More specifically, debtors' financial benefit from filing depends on the amount of debt discharged in bankruptcy, their wealth relative to the wealth exemption, and bankruptcy costs. But their financial benefit does not depend on their future earnings. An alternative model of bankruptcy decisions, proposed by Sullivan, Warren and Westbrook (1989), is that debtors file only when their earnings fall or their expenses rise to the point where it is impossible for them to repay.   In this view, debtors do not plan in advance for bankruptcy, so that the important factors affecting the bankruptcy decision are ability-to-pay and whether adverse events—such as job loss, illness or divorce—have recently occurred.

The two models can be tested against each other, since the financial benefit model predicts that wealth and debt levels determine whether debtors file for bankruptcy, while the adverse events model predicts that ability-to-pay and adverse events are the most important determinants. Fay, Hurst and White (2002) tested the two models using household-level panel data. They found that debtors are significantly more likely to file for bankruptcy when their financial benefit from filing is higher. But they also found evidence that ability-to-pay affects bankruptcy decisions—households with higher incomes were less likely to file and those whose income fell were more 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 bankruptcy.   But a divorce in the previous year was found to increase the probability of bankruptcy. Thus the study supports the hypotheses that financial

benefit and ability-to-pay affect the bankruptcy decision, but does not support the hypothesis that adverse events trigger bankruptcy filings.[29]

Other authors have examined how stigma affects bankruptcy filings. Fay et al (2003) used the aggregate bankruptcy filing rate in the household's region during the previous year as an inverse proxy for the level of bankruptcy stigma. The idea is that when more filings occur in a region, people are more likely to hear about bankruptcy from friends or relatives and they interpret the additional information as implying that less stigma is attached to bankruptcy. Fay et al found that, in regions with lower bankruptcy stigma, households were significantly more likely to file.[30]

Ausubel and Dawsey (2004) used credit card data to examine debtors' decisions both to default 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. They refer to default without bankruptcy as "informal bankruptcy." Ausubel and Dawsey find that wealth exemptions mainly affect debtors' default decisions; while restrictions on the fraction of wages that can be garnished mainly affect debtors' bankruptcy decisions. These results are not surprising, since wealth exemptions apply both in bankruptcy and out of bankruptcy, while garnishment restrictions only apply outside of bankruptcy (since filing for bankruptcy ends wage garnishment completely). Ausubel and Dawsey's results provide empirical evidence supporting both the economic model of the bankruptcy decision and the hypothesis that some debtors default without filing for bankruptcy. [31]

5. Bankruptcy and Credit Markets

Wealth exemptions also affect both demand for and supply of credit. When wealth exemptions are higher, debtors are more likely to file for bankruptcy and this makes lending less attractive. Creditors respond by raising interest rates and/or reducing the supply of credit. But

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[29] Keys (2009) argues that job loss does significantly increase debtors' probability of filing for bankruptcy in the following year.

[30] Other studies of the effect of stigma and information on bankruptcy filings include Gross and Souleles (2002) and Cohen-Cole and Duygan-Bump (2010).

[31] Other papers that examine the bankruptcy filing decision include Buckley (1994), Domowitz and Sartain (1997), Fisher (2003), and Lefgren and McIntyre (2009).

higher wealth exemptions reduce the downside risk of borrowing and therefore cause debtors—if they are risk averse—to demand more credit.

Gropp, Scholz and White (1997) examined the effect of wealth exemptions on consumer credit markets. They found that households were significantly more likely to be turned down for credit if they lived in states with high rather than low wealth exemptions. Interest rates were also found to be higher in states with high wealth exemptions, but the size of the effect depended strongly on debtors' wealth. Low-wealth households paid higher interest rates if they lived in states with high rather than low wealth exemptions, but high-wealth households paid the same interest rates regardless of the exemption level. In addition, households with low wealth borrowed less if they lived in states with high rather than low wealth exemptions, but households with high wealth borrowed more. These results suggest that when states adopt high wealth exemptions, lenders respond by redistributing credit from low-wealth to high-wealth households. Thus while policy-makers often think that high wealth exemptions help the poor, in fact they appear to harm poor debtors and help rich ones.

Other studies examine the effect of wealth exemptions in bankruptcy on specialized credit markets, of which one is the market for small business loans. Loans for small businesses are predicted to be affected by wealth exemptions, since these loans are personal liabilities of the business owner whenever the business is non-corporate. Berkowitz and White (2003) found that small businesses were more likely to be turned down for loans if they were located in states with high wealth exemptions. Also small businesses paid higher interest rates for loans in these states. These results, combined with the effect of bankruptcy on entrepreneurial behavior, suggest that higher wealth exemptions are a two-edge sword for small businesses: they encourage more individuals to become self-employed, but reduce their businesses' access to credit.

One credit market in which wealth exemptions are less likely to be important is the market for mortgages. Wealth exemptions are predicted not to affect the terms of mortgage since when a house is sold following mortgage default, the proceeds are used to repay the mortgage in full before the homeowner benefits from the wealth exemption. But exemptions affect the mortgage market indirectly, since bankruptcy delays foreclosure and therefore makes it more expensive for lenders. Berkowitz and Hynes (1999) and Lin and White (2001) both examined this issue, but found contradictory results. Chomsisengphet and Elul (2006) found that wealth exemptions had

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no effect on mortgage markets when they also controlled for borrowers' credit scores in their regression models. They argue that credit scores are correlated with wealth exemptions, so that exemptions erroneously appear to be significant when credit scores are omitted.

Bankruptcy also affects debtors' access to credit after filing, because U.S. law allows filings remain on debtors' credit records for up to 10 years. Han and Li (2009) examine how filing for bankruptcy affects post-bankruptcy access to credit. They find that debtors borrow less and pay more for loans following bankruptcy and that the effect persists for the entire 10-year period. This suggests that allowing bankruptcy filings to remain on debtors' credit records for 10 years is a non-trivial punishment for bankruptcy.

Wealth exemptions in bankruptcy also affect the composition of debtors' portfolios. When exemptions are higher, households have an incentive both to hold more assets and to hold more debt. They prefer to hold both assets and debt rather than using the assets to repay the debt, because debt is discharged in bankruptcy if it is unsecured, but households are allowed to keep assets in bankruptcy as long as they are exempt. Lehnert and Maki (2002) test whether households in states with higher wealth exemptions simultaneously hold more debt and more assets—a behavior that they call "borrowing to save." They find evidence that more households borrow to save in states with higher wealth exemptions.

6. Bankruptcy and Homeowning

Prior to 2005, homeowners in financial distress could use bankruptcy to save their homes. Because unsecured debts are discharged in bankruptcy, filing increased homeowners' ability to make their mortgage payments and keep their homes. But in 2005, a reform of bankruptcy law raises the cost of filing and forced some filers with high earnings to use some of their post-bankruptcy income to repay unsecured debt. Thus the reform is predicted to cause default rates on mortgages to rise. Li, White and Zhu (2010) tested this prediction and found that default rates on mortgages increased after bankruptcy reform, particularly for homeowners with high incomes. Morgan, Iverson and Botsch (2008) found that foreclosure rates also increased after the reform. Thus the 2005 bankruptcy reform caused mortgage default and foreclosure to rise even before the start of the financial crisis.

7. Why have U.S. bankruptcy filings increased so sharply since 1980?

The number of bankruptcy filings in the U.S. increased five-fold between 1980 and 2004. Although the various models just discussed provide a number of explanations for why debtors file for bankruptcy, none can explain the large increase in the number of filings over time. More adverse events cannot explain the increase, because the unemployment rate, the divorce rate, and the fraction of households lacking health insurance did not increase over the period. Higher financial benefit from filing similarly cannot explain the increase, because the fraction of households that would benefit from filing for bankruptcy did not increase over the period. The most likely explanation for the increase in filings was the increase in the average level of unsecured debt held by households, which also rose five-fold over the period. The increase in debt levels resulted largely from higher credit supply, which in turn was due to a combination of technological advances in lending, abolition of limits on interest rates, and changes in the regulation of the banking industry.[32]

III. Conclusion

This essay started by discussing the three most important components of bankruptcy—collection resolution of all the bankrupt entity's debts, rules for determining how much of the bankrupt entity's assets and income must be used to repay and how payments are divided among creditors, and punishments for default and bankruptcy. It then examined how bankruptcy law affects the behavior of both corporations and individuals and how it affects economic efficiency. Corporate bankruptcy law was shown to affect the supply and demand for business credit, corporate managers' incentives to work hard, invest and take risks, and whether financially distressed firms shut down versus continue to operate. Bankruptcy law not only affects financially distressed corporations and their creditors, but also their workers and competitors and—during periods of financial crisis—the entire economy. Personal bankruptcy law was shown to affect individual debtors' incentives to work hard both before and after bankruptcy, become and remain entrepreneurs, take risk, become and remain homeowners, borrow and default on debt, obtain health insurance, and get divorced. Bankruptcy law also affects the welfare of debtors' families and neighbors. Because bankruptcy law affects behavior in so many ways, its effects are often complicated and go both ways—for example, raising exemption levels

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[32] See Mann (2006), White (2007), and Dick and Lehnert (2010) for discussion.

in bankruptcy both encourages individuals to go into business, but also harms small businesses by reducing their access to capital.

Figure 1:
The Insurance Effect of Bankruptcy
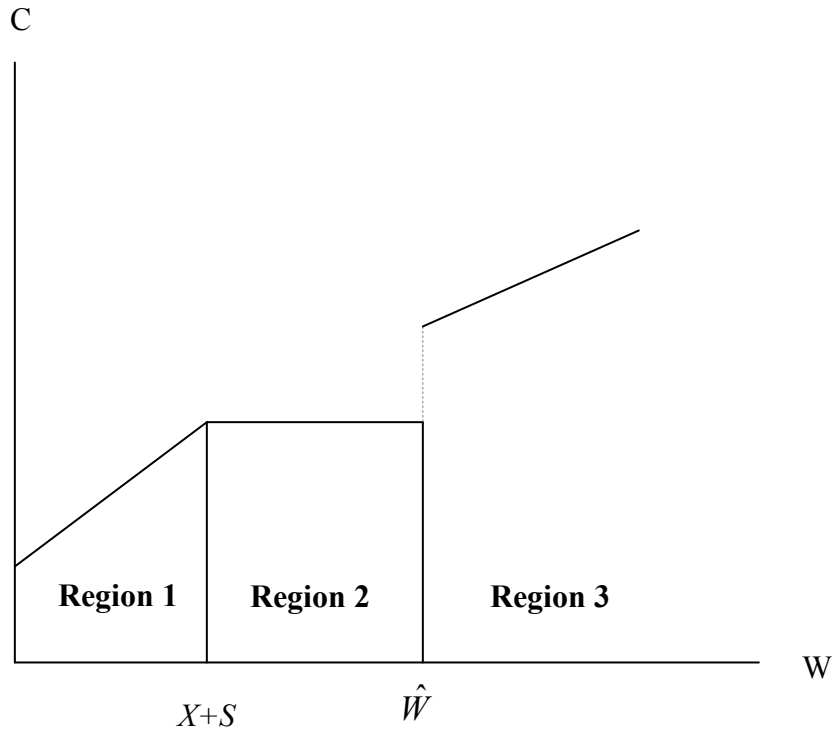
Note: The diagram shows period 2 consumption on the vertical axis and period 2 wealth on the horizontal axis. Labor supply is assumed to be higher outside of bankruptcy than in bankruptcy. Debtors file for bankruptcy in regions 1 and 2 and avoid bankruptcy in region 3.

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