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Program for Studies in Law,
Economics, and Public Policy

Working Paper # 228

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A Theoretical Inquiry

by

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(October, 1999)

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Abstract: This paper uses a principal/agent framework to analyze consumer bankruptcy. The bankruptcy discharge partly insures risk averse borrowers against bad income realizations, but also reduces the borrower's incentive to avoid insolvency. Among our results are: (a) High bankruptcy exemptions increase bankruptcy insurance but at the cost of reducing the borrower's incentives to stay solvent; (b) Reaffirmations -- renegotiations -- have ambiguous efficiency effects in general, but the right to renegotiate is especially valuable for relatively poor persons; (c) Giving consumers the ex post choice regarding which bankruptcy chapter to use also provides more insurance but, by making bankruptcy softer on debtors, has poor incentive effects; (d) Serious consideration should be given to expanding the scope of consumers' ability to contract about bankruptcy because private contracts are better than regulations at making context sensitive tradeoffs between risk and incentives.

Regulating Consumer Bankruptcy: A Theoretical Inquiry

Barry Adler^{*}, Ben Polak^{**} and Alan Schwartz^{**}

1. Introduction

1.1 The subject

A very large fraction of bankruptcy filings each year are by consumers, the number of consumer filings per year is steadily increasing, and consumer bankruptcy is a hot, and controversial, political issue. Consumer bankruptcy, however, has received little theoretical analysis despite its practical and political significance. The four dissenters (out of nine members) to the recent Report of the National Bankruptcy Review Commission (“NBRC”) thus remarked on “the need for a coherent theory of consumer bankruptcy,”¹ and an empirical study published

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¹The NBRC was appointed by Congress to recommend to it reforms of the Bankruptcy Code. A number of recent reform bills have been introduced in Congress in the last two years. See Report of the National Bankruptcy Review Commission, Volume 1 (1997). The Report cites

recently (Gropp, Scholze and White (1997)) stated: “But despite the importance of personal bankruptcy, the subject has been almost completely neglected by economists.” This paper is an early effort to uncover some of the theoretical issues.

To better understand the gap we attempt to fill, realize that most of the scholarship on business bankruptcy has taken an ex post focus, concentrating on what should be done after a firm has become insolvent. In this context, there is an uncontroversial goal and a consensus on the need for regulation to achieve it. The goal is to continue the insolvent firm as an economic entity if its going concern value exceeds its liquidation value. When this inequality is unsatisfied, the firm should be liquidated piecemeal. Regulation may be necessary because the goal of an individual creditor is to maximize its insolvency state payoff. Sometimes this is best done by promptly suing a debt to judgment and seizing particular assets of the firm. When more than one creditor acts on this incentive, the likely equilibrium is for all insolvent firms to be liquidated. Therefore, a bankruptcy system that stays collection and then weighs going concern and liquidation values is necessary to achieve ex post efficiency.

There is no similar ex post efficiency paradigm for consumer bankruptcy. The insolvent consumer cannot be liquidated, but rather will continue on, doing what he had done. Also, if there is a collective action problem, it must take a different form than it takes for business bankruptcy. To see why, suppose there were no bankruptcy procedure and one creditor rushed to judgment, seizing most of the insolvent consumer’s assets. This would injure the other

much of the legal literature relating to consumer bankruptcy.

creditors, but the injury is only a wealth transfer. As just said, the consumer will go on as before, whether one creditor takes the lion's share or the creditors share ratably. What then is the ex post efficiency goal that a consumer bankruptcy system should pursue? What impediments to the realization of that goal must the system eliminate? These questions seldom are asked.

Business bankruptcy scholarship has only recently devoted serious attention to ex ante efficiency. From an ex ante point of view, a bankruptcy system can be regarded as a term in a lending agreement. The issues are what optimal "bankruptcy terms" would look like, and whether the private parties could agree on them. See Schwartz, (1998,1997). Scholars also have asked whether firms choose capital structures or corporate charters that take bankruptcy into account. See Adler (1997, 1993); Haugen and Senbet (1988). See also Rasmussen (1992) (describing the advantages of default rather than mandatory bankruptcy rules). In contrast, apart from occasional suggestions that bankruptcy partially insures consumers against bad income realizations, consumer bankruptcy scholarship has neglected ex ante efficiency altogether. As it happens, consumer bankruptcy is best justified as an insurance system, but then the issue is whether current bankruptcy procedures resemble an optimal insurance contract against personal insolvency. This issue has been almost entirely neglected. We therefore write on a relatively clean slate, and will raise more questions in this paper than we answer.

1.2 The Consumer Bankruptcy System

A consumer borrower has a nonwaivable right to bankruptcy relief, and a choice as to the form that relief can take. When the debtor files for bankruptcy under Chapter 7 of the

Bankruptcy Code, he must give up his nonexempt assets² to his creditors in return for a discharge of his debts. After a Chapter 7 discharge, the borrower emerges from bankruptcy with all of his exempt assets and all of his human capital. Alternatively, a debtor can file for bankruptcy under Chapter 13. This debtor must propose a plan, acceptable to the bankruptcy court, under which he can keep his exempt and nonexempt assets, but he must pay all of his “disposable income” to his creditors in installments. The present value of these installments must at least equal the value of the debtor’s nonexempt assets. A Chapter 13 repayment plan is supposed to last for three to five years. As this sketch suggests, a debtor will file under Chapter 13 when he values his nonexempt assets more than the fraction of his future earnings that the court approved plan will require him to give up.

²Bankruptcy law partitions a debtor’s assets into two classes, those that creditors cannot reach (exempt assets) and those that creditors can reach (nonexempt assets). It also is common to put a monetary limit on exemptions. For example, the debtor’s home usually is exempt but a state may restrict the exemption to equity worth no more than \$20,000. The Bankruptcy Code permits states to set their own exemption levels, and many do.

Several reforms of the consumer bankruptcy system have been introduced in Congress in recent years. Some reformers would like to increase the Federal exemption level and make it binding on the states. This would permit most consumers to emerge from bankruptcy with more property than they can today. After bankruptcy, some consumers “reaffirm”, and thereby reinstate, certain debts in order to retain property a creditor could otherwise seize, or to increase the chance of obtaining more credit from a particular creditor. The NBRC believes that consumers often reaffirm debts unwisely, and that the relatively poor are particularly prone to exploitation in renegotiations. Similar views support the current extensive regulation of reaffirmations (for example, a renegotiation bargain must be approved by the bankruptcy court). The NBRC recently recommended reforms that would eliminate reaffirmations altogether.³

Other reformers sometimes argue that consumers should be permitted to waive their right to, or agree to conditions on, a bankruptcy discharge (in order to obtain a lower interest rate). In another vein, a number of commentators now advocate “needs based” bankruptcy. Under such a system, an insolvent debtor whose future income is expected to be above a statutorily set level would be required to use Chapter 13. The object here, often cast in moral terms, is to prevent a consumer with relatively few nonexempt assets and high expected earnings from painlessly discharging a large amount of debt. As an illustration, consider a debtor with \$50,000 in nonexempt assets, debts of \$350,000, and who will earn \$100,000 per year after bankruptcy.

³The NBRC recommended that reaffirmations of unsecured debt be prohibited and that reaffirmations of secured debt be limited to the wholesale value of the collateral. Since the secured creditor could realize the wholesale value by repossessing, it probably would reject a deal to be paid no more than that value in installments.

This debtor today can file under Chapter 7, sell his debt to his creditors for one seventh of its face value and keep all of his future income. It is arguably more equitable to force the debtor to use Chapter 13, which would require him to share much of his future income with creditors. The desirability of these currently proposed reforms and others could be better assessed were there a more solidly grounded theoretical understanding of consumer bankruptcy.

1.3 Tentative results and open questions

The Bankruptcy Code is a mandatory term in the lending agreement. When credit markets are competitive, as we suppose, the borrower side gets the entire ex ante surplus that credit makes possible. This implies that the private and socially efficient outcomes are the same: a borrower prefers the contract that maximizes his expected surplus, and this contract also will maximize expected social surplus (if there are no externalities). Turning to the borrower's preferences, many scholars and reformers believe that insolvency is exogenous: the consumer borrower becomes insolvent through no fault of his own, in consequence of job loss, illness or the like. See Sullivan, Warren and Westbrook (1989). On this assumption, we first show the standard result that when insurance is actuarially fair and consumers are risk averse, the efficient contract insures the borrower fully. A Chapter 7 discharge is not full insurance: the debtor is "paid" the value of his unpaid debts but not the full loss he may incur from a bad income realization. Were the Bankruptcy Code to become a default, borrowers thus would reject contracts that waived discharge unless they received an appropriate risk premium. Needs based bankruptcy also would be ex ante inefficient in a world of exogenous bankruptcy because it would require wealthier borrowers to pay their disposable future income to creditors for some

years and so would provide no insurance at all.

It is more realistic to suppose that bankruptcy is partly endogenous. A borrower, for example, commonly has some control over whether he works and how much he earns. When moral hazard is included in the analysis, we show, the current bankruptcy discharge is suboptimal in the sense that it does not maximize expected social surplus. Needs based bankruptcy responds to moral hazard because a debtor will have to pay more of his income to creditors in Chapter 13 than in Chapter 7. Requiring debtors to use Chapter 13, however, does not trade off insurance and incentive concerns, but rather slights the insurance concern completely. An optimal lending agreement would not resemble this outcome.

Taking moral hazard into account also permits us to shed some light on other reform proposals. Raising the exemption level exacerbates moral hazard and thus worsens ex ante efficiency. Indeed, if a consumer has too few assets to give up to creditors, he may be unable to borrow. This result may explain recent empirical data that poor consumers have relatively more difficulty getting credit in states with higher exemptions. See Gropp, et. al.⁴ Consumer mortgages partly mitigate this inefficiency because they convert exempt into nonexempt assets and so increase the creditors' insolvency state payoff. Consequently, efforts to restrict the ability of consumers to give security are questionable. Reformers also should consider permitting consumer borrowers to contract for partial discharges. A partial discharge is analytically equivalent to a mortgage.

⁴These authors informally attribute credit denials to low income consumers to asymmetric information.

Finally, reaffirmations have an ambiguous efficiency effect. When a borrower can trade future income for current assets should he become insolvent, the creditor's expected insolvency state payoff increases, and this in a competitive credit market will reduce the interest rate. This reduction in turn improves the borrower's incentive to avoid bankruptcy because the lower the interest rate, the larger is the borrower's share of the solvency state marginal return from effort; and the more effort he will exert to maximize that return. On the other hand, the higher is the borrower's bankruptcy payoff, the less painful bankruptcy is to him, and the less hard will he work to avoid it.⁵

Renegotiation likely will help poor consumers the most. A poor consumer may have to share a large amount of the ex post surplus from renegotiation with his creditors. This has two desirable ex ante effects. The consequent reduction in the interest rate will cause the borrower to work harder to avoid insolvency for the reasons given; and because bankruptcy remains tough on the borrower, renegotiation does not much reduce his incentive to avoid it. Renegotiation for poor borrowers thus often will be efficient and as a consequence also will be in the poor consumer's ex ante best interests (recall that borrowers capture the surplus from efficient lending

⁵Che and Schwartz (1999) analyze a similar tradeoff in the business context. See also Adler (1992) at 475-76 (analyzing "diligence incentives").

agreements). This implies that reaffirmations should be encouraged.⁶

⁶This point should not be overstated because a tough bankruptcy procedure may provide less insurance than some consumers would want.

When reaffirmations are analyzed from an ex ante point of view, permitting debtors ex post to choose which bankruptcy Chapter to use seems questionable. Because parties can renegotiate in Chapter 7, Chapter 13 cannot increase ex post surplus. Debtors, we show, choose the Chapter that minimizes the creditors' insolvency state payoff. This worsens ex ante efficiency because interest rates rise and bankruptcy is softer on borrowers. Permitting debtors to choose between Chapters 7 and 13 thus does not enhance ex post efficiency and reduces ex ante efficiency. On the other hand, very risk averse borrowers may prefer ex ante to have the choice because it increases the amount of insurance that the bankruptcy system provides. Given heterogeneity among borrowers, this analysis suggests permitting borrowers to waive their right in the lending agreement to choose between Chapters. Also, debtors seem competent to make renegotiation bargains. A reaffirmation restores part of the original debt. The reasons that justify permitting consumers to lien their human capital at the borrowing stage also justify permitting insolvent debtors to make ex post efficient trades.⁷

⁷The NBRC was concerned that reaffirmations were inconsistent with the goal of treating creditors equally. A creditor with low monitoring costs has the ability to exact a reaffirmation while other creditors will have their claims entirely discharged. This argument is unpersuasive because the equality goal is misplaced in this context. An equality argument presupposes a metric: firms or persons may be said to be unequal along a particular dimension, such as wealth. The NBRC did not set out a metric. To see why this failure is fatal, consider the concern that some creditors are better placed or are better at collecting debts than others. All creditors, however, had a chance to improve their collection opportunities and abilities. Thus, there would be inequality of opportunity only if firms who are allowed to profit from their commercial talents when extending credit initially should not be allowed to profit from their commercial talents when collecting debts. The NBRC does not explain why the equality goal should be so selectively pursued. The NBRC perhaps was striving for equality of result among creditors, but this would have been a mistake because there already is equality of result. The price for credit will reflect the creditor's insolvency state payoff. Hence, creditors who are inefficient debt

collectors will charge a higher price for credit than the good collectors. But in a competitive credit market, all creditors earn zero profits: the pure profit from efficient collection is competed away. Therefore, there now is equality of result.

1.4 The scope and limits of the analysis

Recent analyses of consumer bankruptcy have considered cognitive error – the borrower irrationally incurs too much debt – and political economy. Regarding the former, this paper largely restricts itself to the rational actor paradigm. At this stage, it seems best to see what an efficient bankruptcy system would look like on the assumption that all of the actors in it are capable of maximizing expected utility. Later analyses should ask which otherwise optimal rules would have to be modified if consumers make systematic cognitive errors. We nevertheless consider how a bankruptcy system should take into account hyperbolic discount rates⁸ because persons do exhibit these rates and because they are consistent with borrower sophistication. The existence of hyperbolic discount rates, we argue, may suggest a different pattern of exemptions than now obtains.

We do not systematically explore the political causes of the current system, again because it seems best to begin with substance. Our analysis is related to politics, however. Political economy analyses have a normative component. For example, a regulator is said to be captured if political pressures caused her not to do what she should do. Thus, it is helpful to be able to say what regulators should do about consumer bankruptcy. We go on in the Conclusion, however, to suggest that much of current law exists in consequence of pressure from the bankruptcy bar and judges, who are the system's greatest concentrated beneficiary group.

⁸A consumer who discounts hyperbolically rather than exponentially overweights present consumption relative to future consumption.

Part 2 analyzes the consumer bankruptcy system on the assumption that bankruptcy is exogenous. Part 3 relaxes this assumption to consider moral hazard. Part 4 discusses hyperbolic discount rates. Part 5 is a conclusion that summarizes the normative implications of the analysis and suggests directions for future research.

2. Bankruptcy without moral hazard

2.1 A simple model

A risk averse consumer borrows the sum D in period zero, promising to repay in period one. The loan enables him to get some nonpecuniary or illiquid benefit worth B to him. The borrower's period one income is subject to a random shock. With probability θ he earns y $\leq D$, and with probability $(1 - \theta)$ he earns zero, and so is insolvent. The present value of his future income in periods after period one is Y which, for simplicity, is assumed to be determinate.⁹ For now, suppose that the consumer has no assets and cannot affect the probability of period one insolvency.

In the absence of a bankruptcy law, a borrower who has a good realization earns y , repays D and then has wealth of $B + y - D + Y$. A borrower who has a bad realization repays nothing in period one, but -- since he cannot declare bankruptcy-- must repay the debt out of future earnings. His wealth in this circumstance is $B + Y - D$.

⁹It is realistic to assume that the debtor will have future income because most debtors who file under Chapter 7 and almost all debtors who file under Chapter 13 are employed. See Domowitz and Sartain (1999a).

2.2 Insurance

A bankruptcy discharge provides the borrower with partial insurance. In this model, a borrower's expected wealth at the beginning of period one is $B + Y - D + y$. A risk averse borrower prefers to have this expected wealth in both possible future states with certainty. Failing that, he would accept some reduction in his wealth in the good state in return for an increase in his wealth in the bad state. Chapter 7 discharges the debtor when he is insolvent. Thus, his insolvency state wealth is simply $Y + B$, the present value of his future income as if the loan had never been made plus the benefit the borrower received from the loan. Since the borrower would pay nothing to creditors in the bad state, he must agree to pay them more in the good state. In a competitive credit market, in which the creditors earn zero profits, a borrower will agree to repay a sum, R , that makes the expected value of the loan equal to the sum lent, D . That is, $D = R + (1 - \delta)0$, so that $R = D/\delta$. The borrower's good state wealth thus becomes $B + Y + y - D/\delta$. Since we assume that $y > D/\delta$, the borrower has greater wealth in the good state than in the bad state, in which his wealth is only $B + Y$; that is, bankruptcy insurance is not full.

This analysis has two normative implications. First, in a world of exogenous bankruptcy, consumer borrowers would not waive their right to a bankruptcy discharge in return for a lower interest rate if the interest rate difference only equaled the expected value of the creditor's loss from default. A borrower would forgo "discharge insurance" only if he also was paid a risk premium. Lenders would not pay risk premiums because the interest rate is set by competition to equal the expected value of the sum the borrower receives. Thus, a lender who also offered a risk premium would incur losses. The issue whether consumers should be free to waive the right

to discharge therefore seems unimportant on the assumptions made so far. Second, in this model, in which the borrower has no assets, needs based bankruptcy would plainly be suboptimal. Under that system, a debtor with a relatively high future income would be required to repay the debt R . The borrower thus would not be insured. A buyer with assets may prefer ex post to keep some or all of them in return for yielding future income, but we postpone discussion of this possibility until moral hazard is considered.

3. Moral Hazard

3.1 The basic analysis

In analyzing moral hazard, we retain all but one of the assumptions in Part 2(1) and add others. In particular, we now assume:

A_1 : Borrowers are risk neutral.

A_2 : The cause of bankruptcy is partly endogenous: that is, borrowers can affect the probability of bankruptcy through their own actions.

A_3 : Creditors cannot observe either a borrower's actions or their effect on the bankruptcy probability; i.e, effort is noncontractible.

Assumption A_1 is made for convenience: we return to the more realistic assumption that borrowers are risk averse below. Regarding assumption A_2 , while medical debt is an important cause of bankruptcy, and is largely beyond a borrower's control, increases in unsecured debt, especially credit card debt, relative to income substantially increases the probability of bankruptcy. See Domowitz and Sartain (1999b). The incurrence of debt, the management of one's financial affairs and working hard at a job are substantially within a borrower's control.

Formally, we capture the existence of moral hazard by making the support of the outcome distribution – the borrower earns either zero or y in period one – be independent of the borrower's effort, but we allow effort to alter the distribution on the fixed support. Assumption A_3 is made because it seems true: were creditors able to monitor borrowers perfectly, very different credit contracts would be observed.

Turning to the analysis, π remains the probability of solvency but now depends on the borrower's efforts.¹⁰ Let $\psi(e)$ be the disutility cost of effort to a borrower, and suppose that $\psi(0) = 0$; $\psi'(e) > 0$; $\psi''(e) < 0$; and $\psi'(1) = \infty$. In brief, the borrower faces increasing marginal costs to reduce the probability of insolvency, and he cannot reduce this probability to zero no matter how hard he works. Recall from Part 2(1) that in a competitive credit market, the borrower promises to repay $R = \frac{D}{\pi}$. This is the creditors' zero profit participation constraint. The variables R and π are endogenous: R is part of the loan contract and the borrower chooses his effort level, which partly determines π , after observing that contract.

Part 2(1) assumed that the loan generated a direct benefit of B to the borrower; the loan did not affect the borrower's future income Y ; but now the borrower's period one income is affected indirectly by his efforts to avoid insolvency. As a consequence, social welfare is the sum of the benefit from the loan, the borrower's future income and his expected period one

¹⁰We model a single credit extension. A common form of borrower moral hazard is to run up credit card debt. Holding the borrower's period one income constant, this would have the effect in our model of reducing the repayment probability π . The Code attempts to restrict this form of moral hazard by authorizing a bankruptcy court to dismiss a case for "substantial abuse". See U.S.C. Section 707(b).

income, less the cost of avoiding insolvency: $W = B + Y + y - ()$. The (social) first best would have the borrower set the marginal benefit of his efforts equal to their marginal costs. This yields

$$(1) y = ()$$

The borrower, however, has promised to repay his creditors out of his period one income if he is solvent and so he chooses to maximize $W_b = B + Y + (y - R) - ()$. The borrower's first order condition (which also is sufficient in this case) thus sets

$$(2) y - R = ()$$

Comparing the social first order condition (1) to the borrower's private first order condition (2), the left hand side of (2) is less than the left hand side of (1) so the borrower will work less hard to avoid insolvency than is socially optimal.

It may be illuminating to describe this result graphically.¹¹

Figure 1 here

The hyperbola represents the creditor's zero profit or participation constraint and is written as $R = D/$. The concave downward-sloping curve represents the borrower's incentive compatibility constraint, written as $R = y - ()$. Both constraints can be satisfied only where the two curves cross; that is, where $y - () = \frac{D}{}$. The social surplus is the area under the concave curve.¹²

¹¹This and Figure 2 are similar to the figures in Baliga and Polak (1998).

¹²Formally, this surplus is $\int_0^y (y - ()) - \frac{D}{}$.
Install Equation Editor and double-click here to view equation.

Hence, the first best would set e^* where the concave curve crosses the axis, confirming the social first order condition (1). The highest level of effort (of e^*) that satisfies both constraints, however, is the lower right crossing of the two curves, the point (e^*, R^*) . The near-triangular shaded area illustrates the dead-weight loss.

The inefficiency arises because the bankruptcy discharge makes the difference in payoffs in the two possible future states smaller for the borrower than it is for society. Put another way, the more “bankruptcy insurance” the borrower has, the less is the difference between the borrower’s solvency and insolvency state returns; and the less hard will he work to avoid insolvency. Were there no bankruptcy discharge, the borrower would have to repay the debt regardless of his period one return, thereby making his private marginal incentive to exert effort equal to the social marginal incentive.¹³

3.2 Collateral

In this Subpart, we retain the assumptions above but add that the borrower has assets to give up to creditors in the insolvency state. Two good effects follow from the debtor’s possession of assets. First, the borrower is more motivated to avoid insolvency because he now has assets to protect.¹⁴ Second, the creditors will charge a lower interest rate (payable in the solvency state)

¹³To see this formally, recall that without a bankruptcy discharge the buyer’s expected wealth is $W_{bn} = B + Y + y - D - \frac{1}{R}(y - D)$. The borrower maximizes his expected wealth in this world by choosing e such that $y = \frac{1}{R}(y - D)$. This is Equation (1), the condition for social optimality.

¹⁴Domowitz and Sartain (1999b) found that homeownership discourages bankruptcy but did not attempt to relate the possession of other assets to the insolvency probability.

because they receive a higher return in the insolvency state. Both effects induce the borrower to choose an effort level that is closer to the social optimum than the level the borrower would choose had he no assets to surrender.

To see how these effects work, let a borrower have assets of A which are below the value of his debt D . Creditors earn R in the solvency state and, because the insolvency state return is zero, they earn A when the borrower is bankrupt, where $A < R$. The zero profit condition thus becomes

$R + (1 - \alpha)A = D$. Just as before, the social first best is given by the condition $y - c(e) = 0$. The borrower, however, now chooses e to maximize $W_b = B + Y + (y + A - R) - c(e)$. He thus will exert effort such that

$$(3) \quad y + A - R = c'(e)$$

The left hand side of Equation (3) is larger than the left hand side of (2), which implies that the buyer will exert more effort to avoid insolvency.

We can illustrate the outcome with a graph similar to Figure 1.

Figure 2 here

The hyperbola represents the creditor's zero-profit or participation constraint, written as

$R - A = \frac{D - A}{\alpha}$. The concave downward-sloping curve represents the borrower's incentive

compatibility constraint, written as $R - A = y - c'(e)$. Once again, both constraints can be satisfied

only where the two curves cross: that is, where $y - c'(e) = \frac{D - A}{\alpha}$. We consider four possible

debtor asset levels, $A_1 > A_2 > A_3 > A_4$. As the debtor's nonexempt assets increase, say from A_2 to

A_1 , the hyperbola representing the zero-profit condition shifts down. The (relevant) intersection of the two curves thus shifts down and to the right: the difference in the amount the borrower promises to repay falls to $(R_1 - A_1) < (R_2 - A_2)$ and the probability of solvency increases to $p_1 > p_2$. As the buyer has more assets to offer creditors when insolvent, efficiency is more closely approached and the dead-weight loss area under the curve is reduced. Recall that, when credit markets are competitive, the borrower captures the entire expected gain.¹⁵

¹⁵Another way to phrase the result is to observe that the presence of assets essentially reduces the size of the loan over which the borrower exercises discretion. This reduces the magnitude of moral hazard. The creditors' participation constraint can be written as

Install Equation Editor and double-click here to view equation.

. As A approaches D , the second term on the right hand side approaches zero:

the influence of λ , and thus of borrower effort, on the terms of the lending agreement become negligible.

From a policy point of view, raising bankruptcy exemptions reduces the level of available assets and thus reduces efficiency. If exemptions become too high, some borrowers may be unable to obtain credit because there will be no contract that will satisfy both the lender's participation constraint and the borrower's incentive compatibility constraint. To illustrate this, observe that the asset level A_3 in Figure 2 (for which the constraint curves are just tangent) is the lowest asset level at which the borrower could obtain the loan D . The loan contract corresponding to asset level A_3 still produces positive surplus: in addition to the direct benefit of the loan, B , the surplus generated by borrower efforts (the area under the concave curve) still exceeds the cost of the loan. The curve describing asset level A_4 characterizes a borrower with too few assets to sustain a loan of D . Since a loan at the tangency point still made strictly positive surplus, so also would some of the excluded loan contracts.¹⁶ The inefficiency cost of high exemption levels likely is hardest on relatively poor

¹⁶It has been shown (with a different model) that when there can be moral hazard, a firm that has few assets to offer to creditors in the insolvency state may be unable to borrow. See Schwartz (1994). This regrettable result can be produced by the law, when it reduces the assets that creditors can take after insolvency. There is some indirect evidence to support the result that the exemption level affects borrower incentives. Elul and Subramanian (1999) show that borrowers sometimes move from low to high exemption states when bankruptcy is

consumers. Many relatively poor persons have acquired some assets, but these borrowers are more likely than middle class borrowers to have erratic income prospects.¹⁷

The results in the last two Subparts can be summarized in

Proposition 1: (a) If borrowers are risk neutral, a bankruptcy discharge is ex ante inefficient because it reduces to below the socially optimal level the borrower's effort to avoid bankruptcy; (b) The inefficiency attributable to discharge is mitigated when the borrower has assets to give up to his creditors in the insolvency state; (c) Exemption laws remove assets from the bankrupt estate and thereby restore some of the ex ante inefficiency.

contemplated. If borrowers will do this, they likely also will exert effort initially to preserve assets.

¹⁷Under current exemption levels, 95% of Chapter 7 bankruptcies are no asset cases. This suggests that raising these levels still further would injure both consumer borrowers and society.

Remark 1: Proposition 1(a)¹⁸ implies that the bankruptcy discharge should be eliminated because first best occurs when borrowers bear the entire insolvency risk. To eliminate discharge would not be optimal, however, because most borrowers are risk averse. Thus, a socially efficient consumer bankruptcy law would reflect a tradeoff between risk and incentives. It is difficult to devise such a law, though, because risk aversion differs across individuals and is hard for the decisionmaker to observe. Thus, Proposition 1 should be read only to tell decisionmakers not to neglect moral hazard considerations when choosing a bankruptcy system. Parts (b) and (c) of the Proposition are in that spirit.

¹⁸Wang and White (1999) obtain a result similar to Proposition 1(a) in a model in which moral hazard does not arise in connection with avoiding insolvency but rather from the penchant of insolvent debtors to engage in strategic behavior ex post: the debtors rearrange their assets to minimize the creditors' bankruptcy payoff. We consider the effect of this behavior below in our discussion of the debtor's choice of bankruptcy Chapter.

Remark 2: Proposition 1 also suggests that decisionmakers should seriously consider relaxing the current prohibition on contracting about bankruptcy. Creditors could offer borrowers a menu of contracts that would reflect different tradeoffs between insuring against risk and capturing the benefits of stronger incentives.¹⁹ A highly risk averse borrower would choose the full Chapter 7 discharge. A less risk averse borrower, or a borrower with considerable control over his future affairs, would buy less insurance -- agree ex ante to repay a fraction of his debt if bankruptcy occurs. Such a contract would relax the creditor's participation constraint and thus increase the borrower's (and society's) expected surplus. Also, a borrower could condition a waiver of discharge on the nonoccurrence of exogenous, verifiable events such as the failure of the borrower's employer or a sudden, serious illness. In a world of free contracting, discharge thus would be partial or conditional for many borrowers, the extent of these alterations depending on a borrower's preferences and circumstances.

We do not strongly recommend free contracting for three reasons, however. First, when a consumer borrower deals with several creditors, the set of "bankruptcy terms" in the borrower's lending agreements might be inconsistent. An unsophisticated consumer could agree to waive bankruptcy completely in favor of one creditor and partially in favor of another, for example. Thus, some coordination mechanism may be necessary in consumer markets. Second, it may be very costly to specify all relevant contingencies in a contract. Third, we assume that creditors know borrower failure probabilities (in equilibrium) and the distribution of risk aversion in the relevant

¹⁹Recall that when credit markets are competitive, the borrowing side captures the benefits of more efficient lending agreements.

population. If these assumptions are relaxed, adverse selection problems could exist. We do not analyze these three possible impediments to efficient contracting here, and so we recommend only that the contracting issue deserves serious study.

Contracting over bankruptcy does exist in one relevant respect today, however, and it is helpful. A borrower who offers his creditor a security interest or a mortgage partly counteracts the effect of high exemptions by increasing the creditor's insolvency state payoff. Security also creates a positive externality because the increased effort it induces a borrower to exert benefits all of his creditors, secured or not. Consequently, giving security is efficient in the model here. Current restrictions on the ability of a consumer borrower to give security (for example, security interests in household goods are prohibited) therefore are questionable.²⁰

Remark 3: An implicit assumption to here is that the debtor's assets do not generate income. Formally, the debtor's future income, Y , is unaffected by the value or character of the assets creditors can reach. This assumption sometimes is unrealistic. For example, consider a sole proprietor of a machine shop who files an individual bankruptcy petition under Chapter 7. If creditors can take all of her machines, her future earning power may be seriously impaired. The assumption of nonincome generating assets, however, covers a lot of cases: most consumer borrowers generate income only with their human capital. To the extent that this is false, our recommendations regarding exemptions should be modified.

²⁰Agreeing to a partial discharge is analytically equivalent to giving security: both increase the creditor's insolvency state payoff and thus relax its participation constraint. Contracts that give security, however, may be easier to coordinate than contracts that pledge income because security is convenient for creditors to observe.

3.3 Renegotiation

Many debtors reaffirm part or all of a debt after filing a Chapter 7 bankruptcy. A large number of these reaffirmations are with secured creditors, and involve trading future income for the right to retain current nonexempt assets. Reaffirmations are heavily regulated today, and the NBRC in effect recommended that they be prohibited. Debtors are said often to make foolish reaffirmation bargains, in which they give up too much for what they get.

Reaffirmations (called here “renegotiations”) have three affects. To understand these, realize that a typical asset has two values, its value to the debtor (A^D) and its value to the market (A^M). A creditor who repossesses, or who gets the value of the debtor's assets after discharge, realizes A^M . We assume that $D > A^D \geq A^M$ (assets are worth less than the debt and generate surplus for their owners) so that debtors always want to renegotiate.²¹ The first affect of reaffirmations is that they increase ex post surplus; that is, society realizes A^D rather than A^M .

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The other two consequences of reaffirmations affect ex ante efficiency, and depend on the ex post bargaining power of the borrower and his creditors.²² Let $\alpha \in [0, 1]$ index the debtor's bargaining power, where $\alpha = 1$ means that the entire ex post surplus from renegotiation ($A^D - A^M$) accrues to the debtor. In the usual case, bargaining power is shared. The debtor keeps his

²¹If an exempt asset is worth more to the market than to the debtor, the debtor can sell the asset to his creditors. Such sales are not controversial because the debtor does not lien his future income.

²²Our assumption that credit markets are competitive ex ante does not imply that creditors have no ex post bargaining power.

nonexempt assets and make a payment to the creditor (out of future income) of

$A^M + (1 - \alpha)(A^D - A^M)$. The second affect of reaffirmations is that competitive credit markets, anticipating this greater payment in the insolvency state, will force lenders to reduce the interest rate.²³ When the interest rate falls, the borrower keeps more of the marginal solvency state return and so will exert more effort to avoid bankruptcy. This is ex ante efficient. On the other hand, the debtor's share of the ex post surplus from renegotiation, $\alpha(A^D - A^M)$, reduces the harshness of insolvency for the debtor (who previously lost the entire value of his non-exempt assets). This third effect reduces the incentive of a borrower to avoid bankruptcy and so is ex ante inefficient.

While it seems impossible to sign the effect of renegotiation in general, we can identify the parameters on which the sign depends.

Proposition 2: Renegotiation is ex ante efficient when $\alpha < (1 - \alpha)$.

Proof See Appendix 1.

²³This would here entail reducing the amount the borrower promises to repay: i.e., lowering R.

Regarding the intuition, renegotiation has two positive efficiency effects. First, it generates an ex post surplus in the insolvency state (this is $A^D - A^M$). Second, if the creditor expects to share in this surplus, interest rates in the solvency state will fall and the buyer's incentive to provide effort will increase. When the borrower will succeed with a relatively low probability (θ is small), the second effect will be significant: if failure is likely, the expected value of the insolvency state surplus is large, and this will lower the interest rate and thereby increase the borrower's incentive to avoid bankruptcy. The third effect of renegotiation is to lower the borrower's incentive to avoid bankruptcy because the borrower keeps part of the ex post surplus, but this effect is slight when the borrower has little ex post bargaining power (β is small). The creditor then keeps a large share of the insolvency state surplus, which lowers the interest rate, and the borrower has a strong incentive to avoid bankruptcy because he does badly in it. Proposition 2 thus holds that renegotiation is ex ante efficient when both θ and β are small. The Proposition, however, only considers how the success probability and the parties' ex post bargaining power can alter the ex ante efficiency effects that renegotiation produces. Consequently, the Proposition is not an if and only if result: a renegotiation that failed to satisfy the Proposition's inequality could be efficient all in all if it produced enough ex post surplus. A renegotiation that does satisfy the inequality necessarily is efficient, though, because the surplus generating effect of renegotiation always is positive and the latter two θ and β effects would then be positive on net.²⁴

Remark 4: Proposition 2 suggests that renegotiation will help relatively poor borrowers,

²⁴This analysis does not require renegotiation to be 100% ex post efficient. The proof of Proposition 2 only considers renegotiations that recover ex post surplus at the margin.

the group the NBRC was most concerned about. The success probability for them is likely to be low and they may be less able bargainers. When β and γ both are low, renegotiation maximizes expected social surplus, and the borrowers will capture all of this gain in the form of better ex ante credit terms.²⁵

²⁵Many consumers reaffirm unsecured debts, apparently to increase the debtor's ability to get credit (a reaffirmation is a good signal of future willingness to repay). These reaffirmations have good ex ante incentive effects. Creditors who anticipate getting reaffirmations will reduce the interest rate, yet because bankruptcy would remain hard on the borrower he will not exert less effort to avoid it.

Remark 5: Proposition 2 also shows how partial bankruptcy waivers can increase efficiency. Consider three possible legal rules: (a) Renegotiation is banned completely. The ban could only be efficient when β and γ are high, but perhaps not even then because the ban wipes out the insolvency state surplus; (b) Renegotiation is permitted but ex ante bankruptcy contracts are banned. Permitting renegotiation restores the ex post surplus but can yield inefficiency when β and γ are high; (c) Renegotiation and partial bankruptcy waivers both are permitted. A borrower then could waive his right to a share of the ex post surplus when β and γ are high. The borrower would do this when the improvement in his ex ante terms of trade outweighs his loss of surplus; and the waiver would be efficient because the borrower would be better off and the creditor no worse off (earning zero profits in all equilibria). Hence, rule (c) is preferable to rules (a) or (b).²⁶

These results rest importantly on the assumption that credit markets are competitive. When this assumption is relaxed, then the case the NBRC imagined exists: renegotiation disadvantages borrowers with little bargaining power (a low γ). Formally, we have

Proposition 3: If the creditor has a monopoly at the lending stage but the borrower retains some of the (ex ante) surplus that the equilibrium lending agreement creates, then renegotiation is advantageous to the borrower when $\beta > \frac{1}{2}$. As β falls toward zero, renegotiation harms the borrower.

Proof See Appendix 2.

²⁶The caveats respecting freedom of contract made in Remark 2 after Proposition 1 also apply here, and to Remark 6 below.

We first set out the intuition and then argue that the result should not influence bankruptcy policy. To begin, retain all of the assumptions made above except let the creditor have a monopoly at the lending stage and then assume that renegotiation is banned. The creditor could raise R (and thus the interest rate) to the monopoly level, but the success probability θ falls when R increases. The creditor in this legal world earns R when the borrower succeeds and A^M , the market value of the borrower's nonexempt assets, when the borrower fails. Thus, the cost to the creditor of raising R is the marginal decrease in θ times the creditor's marginal gain from success $(R - A^M)$. Because this cost is positive, the creditor has a strong incentive not to raise R to the monopoly level, thereby leaving the borrower with some ex ante surplus. Put concisely, moral hazard will here constrain monopoly pricing.²⁷

Now assume that renegotiation is permissible and consider the extreme case where the borrower has no bargaining power ($\beta = 0$). Unlike a similar borrower when the credit market is competitive, this borrower is made worse off by renegotiation. Neither borrower will realize ex post surplus, but in the monopoly case the interest rate rises when the borrower lacks ex post bargaining power, while in the competitive case the interest rate declines. To understand why the rate increases in the monopoly case, recall that when the borrower has no ex post bargaining power and renegotiation is permitted, the creditor captures all of the ex post surplus and so its insolvency state payoff rises to A^D . As a consequence, the marginal cost of increasing R becomes the marginal

²⁷When the creditor has market power, two cases can arise. In the more common one just described, the borrower's participation constraint is slack; the buyer retains ex ante surplus. It can happen, though, that this constraint will bind.

decrease in β times $(\beta - A^D)$. This is a smaller cost than when renegotiation is banned, because $A^D > A^M$, so the creditor will raise R . Therefore, when the creditor has market power ex ante and bargaining power ex post, the borrower, who likely is a relatively poor person, not only realizes little ex post surplus but also faces a higher interest rate.

Now consider the second extreme case, in which the borrower has all of the ex post bargaining power ($\beta = 1$). The interest rate will fall for this borrower relative to the borrower with little bargaining power, for two reasons. First, the marginal cost to the creditor of raising the interest rate is restored to the marginal decrease in β times $(\beta - A^M)$ because the creditor now realizes no ex post surplus. Regarding the second reason, the borrower now has a smaller incentive to avoid bankruptcy because bankruptcy is less harsh on him and so β falls. When the probability that the creditor will be repaid declines, the marginal benefit of increasing the interest rate R also declines. Therefore, a borrower with considerable ex post bargaining power both keeps more of the ex post surplus and pays a lower interest rate. Proposition 3 characterizes these results precisely, stating that a sufficient condition for renegotiation to become beneficial to the borrower is that he have more than half the ex post bargaining power.

Proposition 3 should not count in favor of banning or restricting reaffirmations, however. As a matter of fact, credit markets appear competitive so the Proposition likely describes few real world cases. Further, monopoly power in credit markets often is a consequence of regulation. Hence, often a good response to it is to reduce barriers to entry. Apart from this, it is better to attack market power directly with the anti trust laws than attempt to ameliorate one of its many affects by regulating reaffirmations.

3.4 Renegotiation and the debtor's choice of bankruptcy Chapter

That debtors can renegotiate in Chapter 7 also implies that there is an efficiency cost to permitting an insolvent debtor to choose which bankruptcy Chapter to use. Renegotiation in Chapter 7 permits the parties to realize $A^D - A^M$, the difference between the value of an asset to the debtor and to the market. Chapter 13 may redistribute this surplus -- by permitting the borrower to pay the creditor less than in a Chapter 7 renegotiation -- but cannot increase it. It remains to show that the availability of Chapter 13 worsens ex ante efficiency. Begin with the debtor's choice between Chapters. A Chapter 13 debtor can keep all of his assets but must pay over all of his disposable income to his creditors. The debtor will ignore exempt assets when choosing between these Chapters because both permit him to keep them.

Turning to nonexempt assets, let the bankruptcy court permit a Chapter 13 debtor to keep α of his post bankruptcy income Y , where $0 < \alpha < 1$.²⁸ The price of keeping an exempt asset in Chapter 13 thus is $(1 - \alpha)Y$, the sum in present value terms that creditors get. The debtor will compare the prices for keeping the asset that the two Chapters set. Chapter 13 is preferable when $(1 - \alpha)Y < [A^M + (1 - \alpha)(A^D - A^M)]$. The term in brackets on the right hand side is the Chapter 7 renegotiation payment the debtor makes to the creditor in order to keep the asset. This expression simplifies to $(1 - \alpha)Y < A^D - \alpha(A^D - A^M)$. Hence, debtors prefer Chapter 13 when they can keep a large share of their post bankruptcy income (α is big); when they have a high valuation for the asset

²⁸The bankruptcy court should set α to eliminate the borrower's disposable income. Thus, α is a function of the borrower's post-bankruptcy income Y . We do not explicitly consider the effect of bankruptcy on Y and so we assume here that α is exogenous.

(A^D is big); when they have little bargaining power in Chapter 7 ($_$ is small); and when there is little surplus over which to renegotiate ($A^D - A^M$ is small).²⁹

More significantly, the parties' preferences conflict. To see how, let $A^D - A^M = x$ so that the debtor prefers to use Chapter 13 when $(a)(I - _)Y < A^D - x$. The creditors prefer the debtor to use Chapter 13 when the Chapter 13 payment to them is larger than the share of the renegotiation surplus they can extract in Chapter 7; that is, when $(b)(I - _)Y > A^D - x$. Intuitively, the debtor will choose the Chapter that minimizes the price for keeping the asset while the creditors would prefer him to choose the Chapter that maximizes the price. Hence, when the debtor files for bankruptcy under Chapter 7, his creditors would have preferred him to file under Chapter 13.

Turning to ex ante efficiency, because debtors use Chapter 13 when they do better under it than they would do in a Chapter 7 renegotiation, the availability of Chapter 13 makes bankruptcy less harsh on borrowers in expectation and they will work less hard to avoid it. Also, because Chapter 13 permits debtors to minimize the creditors' ex post payment, its existence causes creditors to raise the interest rate. This further worsens the borrower's incentives because the borrower can keep less of the marginal solvency state return, and so will exert less effort to maximize that return.

Another way to explain this result is to refer to Proposition 2, which showed that

²⁹Domowitz and Sartain (1999 (a) and (b)) find that borrowers are more likely to choose Chapter 7 when the exemption level is high. This is consistent with the analysis here: a high exemption level implies that a borrower is less likely to have nonexempt assets that are worth a lot to him (that is, A^D is small).

renegotiation increases ex ante efficiency when $\beta < 1 - \alpha$. The availability of Chapter 13 increases the debtor's bargaining power (increases β) because creditors may have to bribe the borrower to use Chapter 7. When the debtor has more bargaining power ex post, the inequality is harder to satisfy and renegotiation is less likely to be ex ante efficient. This analysis can be summarized in

Proposition 4: There is an efficiency cost to permitting borrowers to choose between Chapters 7 and 13 because Chapter 13 cannot increase ex post efficiency and giving debtors the option worsens ex ante efficiency.

Remark 6: A highly risk averse borrower might prefer ex ante to retain the choice of filing under Chapter 7 or Chapter 13 because this maximizes the borrower's insolvency state payoff and thus gives him more insurance. Proposition 4 thus does not support repeal of Chapter 13, but it does suggest that borrowers should be allowed to waive their right to use either Chapter 7 or Chapter 13 (making the nonwaived section operative). A borrower would offer a waiver when the improvement in his ex ante terms of trade would exceed the expected value of any increased ex post benefit from having a choice of Chapters. Such contracts would increase efficiency but are unenforceable today.

Remark 7: *Requiring* high income debtors to use Chapter 13, as with needs based bankruptcy, could improve ex ante efficiency in two ways. First, if borrowers are risk neutral than Proposition 1a showed that they would reject bankruptcy insurance. Chapter 13 requires debtors to pay over all of their disposable income to creditors, and thus leaves borrowers largely uninsured. Second, debtors have less bargaining power in Chapter 13 than in Chapter 7. Proposition 2 showed that ex ante efficiency increases (in the competitive case) when the debtor's bargaining power

declines. Many borrowers, however, are risk averse. As to these borrowers, the law must harmonize the conflicting goals of insuring borrowers and providing them with appropriate incentives. A mandatory Chapter 13 would not be optimal in this world because it largely deprives the borrower of insurance. Therefore, the alternatives of permitting free contracting or reducing a borrower's bargaining power in Chapter 7 should be considered and rejected before advocating a mandatory Chapter 13.

3.5. Renegotiation and the debtor's human capital

The fresh start policy embodied in Chapter 7 permits a debtor to emerge from bankruptcy with his human capital intact. This is desirable for two reasons. First, the debtor or his family is less likely to become a ward of the state. Second, a person with liens on his future income may work less hard, and will not fully internalize the cost of shirking. Some of that cost will be borne by the tax collector (because the debtor earns lower wages), and some by the debtor's employer and others (because the debtor is less socially productive).³⁰ A strong commitment to the fresh start policy would imply prohibiting reaffirmations. A strong commitment to this policy is hard to justify, however.

A debtor who renegotiates in Chapter 7 is restoring part or all of a debt. If society permits a person to incur debts, it apparently also should permit reaffirmations. Also, society today permits a

³⁰The externality justification for discharge should not be overstated because the increase in interest rates that discharge causes may prevent a borrower from making investments that also generate positive externalities. For example, high interest rates may dampen demand for credit used to finance the borrower's education, and this may justify the current nondischargeability of government-subsidized student loans.

debtor to lien a large portion of his future income in Chapter 13. If a lien is permissible under one bankruptcy Chapter, it is difficult to see why the same or a smaller lien should be impermissible under the other.

To be sure, the debtor has failed once and so may be thought to be less trustworthy. This seems a weak ground on which to ban reaffirmations.³¹ Bankruptcy seldom is a happy experience so a debtor is likely to be more careful when bargaining while insolvent than he was when incurring the original debt. Also, creditors who agree to reaffirmations are trading the right to receive an asset today for a claim on the debtor's future income. The creditors' desire to be repaid suggests that market discipline will help to prevent reaffirmation bargains that debtors are unlikely to keep. These arguments suggest that while a desire to protect a person's human capital implies that there should be a bankruptcy discharge, that desire does not also imply the prohibition of ex post efficient partial waivers.

4. Cognitive error and hyperbolic discount rates

³¹Some reformers who oppose reaffirmations on the ground that sophisticated creditors will exploit unsophisticated borrowers who mistakenly took on too much debt also claim that insolvency is exogenous. These positions are in tension because an inference that a person is commercially incompetent cannot rest on a bankruptcy caused by an exogenous event. Hence, if consumers can be trusted to borrow initially, they apparently should be trusted to reaffirm.

Many reformers believe that bankruptcy should be soft on consumers because consumers inadvertently take on too much debt. Three sources of improvident behavior are offered: lack of sophistication; lack of information; and lack of rationality. This paper assumes these problems away for two reasons. First, it should be helpful to have as a benchmark what a good consumer bankruptcy law would do on the assumption that consumers can make credit decisions in their own best interests. Second, it is an open question whether bankruptcy law should be the institutional vehicle for dealing with problems that transcend the insolvency context. We make a few remarks here, however, about a violation of rationality that has particular relevance to intertemporal decision making. The violation is to overweight the present relative to the future, and the effect of so doing is captured by supposing persons to discount the future hyperbolically rather than exponentially.³²

The effect of this behavior is illustrated by observing the consumer's marginal rates of substitution between current and future consumption from the perspective of two time periods: (a) tomorrow -- time $t + 1$ -- for consumption between tomorrow and the day after tomorrow and (b) today for consumption between now and tomorrow. Letting $\beta = \frac{1}{1+r}$ be the exponential discount rate and $0 < \beta < 1$, we see that

$$(a) \frac{u(c_{t+1})}{u(c_{t+2})}$$

³²See Laibson (1998, 1997). Some psychologists attribute over weighting the present relative to the future to the effect of "visceral factors" such as hunger or moods and emotions. See Lowenstein (1996). We are not concerned here with the cause of hyperbolic discount rates but rather with their implications for bankruptcy law.

$$(b) \frac{u(c_t)}{u(c_t)}$$

The individual comparing consumption utilities in two future periods -- expression (a) -- will discount the utility from the later of the periods by the exponential discount factor β ; but the same person comparing today and tomorrow -- expression (b) -- will discount tomorrow by the higher discount factor β .³³ Hence, the person's preferences today as between two future periods are inconsistent with the preferences he will have when the first of these periods is reached. More prosaically, Joan would like to save money in the future but whenever Joan has an actual choice whether to spend today or save for tomorrow, she will save less than her long term saving plan requires.

Hyperbolic discount rates have been observed in the real world. They apparently are a basic property of human beings (and of animals). They are consistent with sophistication, and perhaps with rationality, because persons recognize that they have these rates and sometimes engage in precautionary behavior. A person would like to make a contract with a third party that if she overspends today, she must pay a large fine, but these contracts are not enforceable (or practical). A substitute for this is to invest in illiquid retirement accounts. Another is to invest in illiquid assets. Consider a mortgage in real property. Each period the borrower pays the lender. There is a "fine" for default because persons commonly derive surplus from owning property and default implies

³³When $\beta < 1$, then $\beta < \beta$. Because [click here to view equation.](#) Install Equation Editor and double-click here to view equation. , discounting consumption between

today and tomorrow by β implies that the decision maker is using a higher discount rate r .

foreclosure. Thus, the mortgaged property is illiquid, and investing in it is a form of forced saving that partly overcomes the effect of having a hyperbolic discount rate. An implicit premise is that the property will hold its value when the mortgage is paid off, which seems realistic for most times and places.

The relevance of hyperbolic discount rates for bankruptcy reform is complex. To begin to pursue it, partition illiquid assets into two classes, those that a person can purchase out of his ordinary income and those that he needs credit to acquire. An IRA illustrates the former class. A consumer who can borrow on the strength of retirement accounts can convert an illiquid into a liquid asset. Therefore, it may be wise to make assets such as IRAs exempt in bankruptcy because the exemption will chill borrowing. A home is in the second asset class because few consumers can purchase homes for cash. A bankruptcy exemption for this class of asset seems unwise because the consumer will be unable to acquire the asset initially if he could not offer the asset as collateral. On the other hand, if the asset is not exempt, a consumer may be able to borrow on its strength, as by taking a home equity loan. Such loans again permit the consumer to convert an illiquid asset to a liquid asset. Thus, the Bankruptcy Code perhaps should treat first and second mortgages differently.

This suggestion deserves more thought, however, because consumers may use home equity loans as they use credit cards, for consumption smoothing. Consequently, incurring both types of debt may be consistent with rationality and a consumer's long term plan despite the high interest

charges that accompany these forms of borrowing.³⁴ In short, the relevance of hyperbolic discount rates to law reform in general, and bankruptcy law in particular, deserves more thought than we can give it here. This thought is worth exercising because the existence of time inconsistent preferences suggests that it may be appropriate to take a more nuanced view of bankruptcy exemptions.³⁵

5. Conclusion

This paper attempts to contribute to the small literature that treats consumer bankruptcy theoretically. It argues that a consumer bankruptcy system should have two ex ante goals: to insure consumers, to the extent possible, against bad income realizations and to reduce moral hazard in connection with lending agreements. These two objectives are in tension because the borrower's incentive to avoid bankruptcy is decreasing in the extent to which bankruptcy insures him. This tension can be partly mitigated by permitting the borrower to offer his creditors assets as well as income in the insolvency state. Consequently, efforts to raise the personal exemption level would reduce ex ante efficiency. A borrower also can offer creditors assets by giving security in them. Because security interests in consumer goods (and mortgages) increase efficiency, current and proposed restrictions on these security interests generally are ill advised. The tension between the

³⁴For credit cards, see Brito and Hartley(1996).

³⁵In a different vein, Jolls (1997) uses the existence of hyperbolic discount rates to argue that persons who make certain rational long term contracts should be restricted from modifying those contracts in particular future circumstances.

two ex ante goals also will be mitigated by renegotiation in many cases; for renegotiation permits a debtor to increase the creditors' payoff in the insolvency state, and this can improve the borrower's incentive to exert effort to stay solvent. The desirable effects of renegotiation are more likely to benefit relatively less well off consumers. This suggests that current restrictions on reaffirmations should be relaxed and proposals to limit reaffirmations still further are unwise.

We also suggest that serious consideration be given to permitting consumers to contract about bankruptcy. In a world where the cause of bankruptcy is exogenous (there is no moral hazard), consumers would reject contracts that reduced current bankruptcy protections because consumers prefer full insurance. In the world in which we live, a borrower commonly has some control over his fate. Creditors have an incentive to offer such borrowers lending agreements that will induce constrained efficient tradeoffs between insurance and incentives, and the borrowing side will get the benefit of this efficiency. We have not carefully analyzed the contracting process regarding consumer bankruptcy, however, so our proposals to increase free contracting should be regarded more as an agenda for research than as the advocacy of legal change.

An ex post efficient bankruptcy system would permit debtors to trade claims on their future income for the right to retain nonexempt assets, and also will not excessively lien a debtor's human capital. Debtors can make the requisite trades in Chapter 7 renegotiations.³⁶ Hence, Chapter 13 cannot increase ex post surplus and, we show, offering debtors the option to choose a bankruptcy

³⁶The reasons that justify permitting persons to lien their human capital by incurring debt initially also justify permitting them to restore these liens by making ex post efficient reaffirmations.

chapter worsens ex ante efficiency because it makes bankruptcy too soft on debtors and lowers the creditors' expected insolvency state payoff. On the other hand, the ability to choose between Chapters increases the borrower's ex post payoff, and thus provides a little more insurance for very risk averse debtors. Reform proposals to make Chapter 13 mandatory seem ill advised because that would eliminate much of bankruptcy's insurance function. Rather, we argue that consideration be given to permitting consumer borrowers to waive their right to choose among Chapters in the lending agreement. Many consumers likely would prefer the better terms of trade that waiver would yield to the extra insurance that a choice of Chapter provides.

This paper evaluates bankruptcy law with the efficiency norm for a reason. Borrowers realize the entire ex ante social surplus from lending agreements in competitive credit markets. As a consequence, reforms that increase ex ante efficiency also benefit consumers. Reaffirmations also help consumer borrowers by letting them keep a share of the surplus that asset ownership generates. Nevertheless, a harsh bankruptcy law is harsh, and we now have only two things to say about this. First, even under the reforms we tentatively advocate, borrowers would emerge from bankruptcy with their human capital intact, except where they lien portions of it to keep assets that are particularly valuable to them. Thus, we would preserve much of bankruptcy's insurance function. Second, while efficiency should be tempered with compassion, the issue is how to realize this tradeoff in the form of administrable bankruptcy rules. We have not made much progress with this question.³⁷

³⁷In the business context, there is an efficiency tradeoff between soft and hard bankruptcy procedures. A hard procedure has desirable ex ante incentive effects, but insolvent firms are

reluctant to use it. When creditors can observe insolvency only with a lag, the firm thus may keep payments current while it dissipates assets. This is ex post inefficient. See Povel (1999). We do not model this tradeoff here. Many insolvent consumers lack the cash to stall creditors for very long while they dissipate assets and, as shown, they often prefer to keep their assets intact.

Reformers such as the NBRC claim that a good consumer bankruptcy system would ensure equality of result among creditors, reduce strategic behavior by debtors and increase uniformity in administering the law. The pursuit of equality among creditors makes little sense in the bankruptcy context for two reasons: (a) In the zero profit equilibria that commonly obtain in credit markets, no creditor does very much better than the others³⁸; and (b) Pursuing equality among creditors disadvantages debtors, especially the least well off of them, by severely restricting reaffirmations and also by reducing the creditors' incentive to develop more efficient collection mechanisms. The other two reformer goals would be largely achieved by the legal changes suggested here. As an example, two of the most common forms of strategic behavior are converting nonexempt assets into exempt assets on the eve of bankruptcy and using Chapter 13 strategically to stay foreclosure when the debtor has no serious hope of complying with a repayment plan. Debtors would gain less from rearranging their assets were the exemption level reduced and were they more able to give security in their property. The second form of strategic behavior would be ameliorated were borrowers permitted to waive their right to use Chapter 13. Similarly, much of the nonuniformity in current administration is in Chapter 13, and this too would diminish if the Chapter were used less frequently.

Regrettably, the reforms urged here will have a hard time in Congress. Current business and consumer bankruptcy law ban free contracting over bankruptcy and force insolvents into the system. The system also creates incentives for parties to use its most costly parts -- Chapter 11 for business

³⁸See note 7, *supra*.

bankruptcy and Chapter 13 for consumer bankruptcy. Reform proposals, such as needs based bankruptcy, would increase the use of Chapter 13. In addition, current law requires many fact specific inquiries. For example, courts are supposed to find whether a reaffirmation is in a debtor's best interests. The current business and consumer bankruptcy systems thus substantially benefit the bankruptcy bar, the bankruptcy judges and the academics whose consulting income increases with the cost, complexity and court centeredness of the system. These groups have dominated the current reform debate and past debates as well. Informal speculation plausibly suggests that we have the consumer bankruptcy system that the lawyers want.³⁹

³⁹A similar view is in Posner (1997).

Appendix 1

Appendix 1 proves Proposition 2. To begin, let $\alpha \in (0, 1)$ index the effectiveness of renegotiation, where $\alpha = 0$ implies no renegotiation and $\alpha = 1$ implies renegotiation. Also, let $A^D - A^M = x$, the renegotiation surplus. The social surplus from a lending agreement is

$SS = B + (y + A^D) + (1 - \alpha)(A^M + x) - ()$. The marginal social surplus then is

$MSS = \frac{dSS}{d\alpha} = y + (1 - \alpha)x - ()$. The creditors' participation constraint – the zero profit condition

– is $D = R + (1 - \alpha)[A^M + (1 - \alpha)(x)]$. It will later be convenient to have this condition rewritten as

$$(1) \quad R - [A^M + (1 - \alpha)(x)] = \frac{D - [A^M + (1 - \alpha)(x)]}{\alpha}.$$

Given the lending agreement, the borrower chooses α to maximize

$(y + A^D - R) + (1 - \alpha)[A^M + (1 - \alpha)(x)] - ()$. The first order condition for a private optimum thus is

$y + A^D - (1 - \alpha)(x) - () = R$. This can be rewritten as

$$(2) \quad y + (1 - \alpha)(x) - () = R - A^M - (1 - \alpha)(x)$$

The left hand side of (2) is the marginal social surplus and the right hand side is the left hand side of the zero profit condition in (1). Combining (1) and (2) yields an implicit definition of α , which tells how renegotiation affects the failure probability.

$$(3) \quad y + (1 - \alpha)(x) - () = \frac{D - [A^M + (1 - \alpha)(x)]}{\alpha}.$$

In addition, $\alpha < \frac{D - [A^M + (1 - \alpha)(x)]}{2}$ (otherwise, we are at a minimum), which implies

$$(4) \quad () > \frac{D - [A^M + (1 -)x]}{d}.$$

From Equation (3) the right hand side of (4) is the marginal social surplus (MSS).

Renegotiation has two relevant affects: it creates ex post surplus and it alters a borrower's incentives.

The affect of renegotiation on social surplus thus can be written as 5) $\frac{dSS}{d} = (1 -)x + \frac{d}{d} \frac{DSS}{d}$.

The first term in this equation captures the direct effect of increasing ex post surplus and the second

term captures the indirect effect. The first term is positive because $x = A^D - A^M$. Also, $\frac{dSS}{d}$ is

positive because the social surplus is increasing in the success probability of the borrower. Hence,

renegotiation will increase social surplus when $\frac{d}{d}$ is positive. To see when this can happen, totally

differentiate (3) with respect to $_$. Doing this and rearranging terms yields

$\frac{d}{d} [MSS - ()] = -(x)[(1 -) -]$. The term inside the braces on the left hand side of this

expression is negative by Equation (4). Because x is positive, the right hand side of the expression

will be negative; hence, $\frac{d}{d}$ is positive when $< (1 -)$. In this event, renegotiation increases social

surplus and thus is ex ante efficient. This proves the Proposition.

Appendix 2

Appendix 2 proves Proposition 3. The creditor chooses the interest rate R taking into account the effect that R will have on the borrower's choice of effort and hence on the success

probability (the text shows that an implication of this choice often is to leave the borrower with some ex ante surplus, and we analyze this case here). Begin with the borrower's problem. Given R , the borrower chooses α to maximize

$$B + Y + \alpha(y + A^D - R) + (1 - \alpha)((A^D - A^M)) - \frac{c}{2} \alpha^2$$

As just said, the lender will choose R such that $\alpha > 0$ and, by our assumption that $\alpha'(1) = \frac{1}{2}$, we know that $\alpha < 1$. Hence, we can assume an interior equilibrium, with the borrower choosing α to solve the first order condition

$$(1 - \alpha)(y + A^D - R) - ((A^D - A^M)) - c\alpha = 0$$

Since we have assumed that $\alpha''(\alpha) < 0$, the borrower's second order condition is satisfied.

Let $\alpha^*(R; \alpha)$ solve equation (1). Hence, $\alpha^*(R; \alpha)$ is the effort level that a borrower chooses who faces interest rate R and who anticipates renegotiation at level α . For convenience, write this effort level as α^* and let the derivative of this with respect to R be α^*_R (and so forth). We then get

$$a) \quad \alpha^*_R = \frac{-1}{c - \alpha^*} \quad b) \quad \alpha^* = \frac{-(A^D - A^M)}{c - \alpha^*}$$

$$c) \quad \alpha^*_{RR} = -\frac{(\alpha^*)}{(c - \alpha^*)^3} \quad d) \quad \alpha^*_R = \frac{-(A^D - A^M)}{(c - \alpha^*)^3}$$

Our assumptions on α imply that all of these derivatives are negative. To get a sense of what these mean, (a) holds that raising R causes α^* to fall and (b) holds that raising α also causes α^* to fall (because renegotiation is more effective and so the borrower gets more of the ex post surplus and so works less hard).

We turn now to the creditor's problem, which is to choose R (anticipating its effect on λ) to maximize

$$(2) \quad \lambda R + (1 - \lambda)(A^M + (1 - \lambda)(A^D - A^M))$$

Differentiating (2) with respect to R gives the first order condition

$$(3) \quad \lambda + \lambda_R Z = 0$$

The first term is the marginal gain of raising the interest rate and the second term is the marginal cost.

Regarding this term, Z is the marginal benefit to the creditor of the borrower's success. Formally, $Z = \frac{\partial}{\partial R} (A^M + \lambda(1 - \lambda)(A^D - A^M))$, and $Z > 0$.

Let $R^*(\lambda)$ be the interest rate that solves equation (3). The issue is how this equilibrium interest rate varies with λ . Totally differentiating (3) with respect to λ and collecting terms yields

$$\begin{aligned} R^* (\lambda_{RR} Z + 2 \lambda_R) &= \lambda_R (1 - \lambda)(A^D - A^M) - \lambda - \lambda_R Z \\ &= \frac{(\lambda - (1 - \lambda))(A^D - A^M)}{(\lambda)^2} + \frac{(A^D - A^M) - (\lambda)^2 Z}{(\lambda)^3} \end{aligned}$$

From the derivatives above, we know that $(\lambda_{RR} Z + 2 \lambda_R) < 0$. Therefore, if $\lambda > (1 - \lambda)$, the right hand side is positive and $R^*_\lambda < 0$. On the other hand, if $\lambda = 0$, the right hand side is negative and $R^*_\lambda > 0$.

Consider the case when $\lambda > (1 - \lambda)$. As λ increases the borrower faces a lower interest rate in the solvency state and retains a larger share of the surplus in the insolvency state. Thus, the borrower is better off even if he holds his choice of R fixed at what now is not the optimum level. Assume next that $\lambda = 0$ so that $R^*_\lambda > 0$. In this case, as λ increases, the borrower must pay a higher interest rate in the solvency state and retains no ex post surplus in the insolvency state. Thus, he is

strictly worse off. By continuity, this result holds for ϵ sufficiently small. This proves the Proposition.

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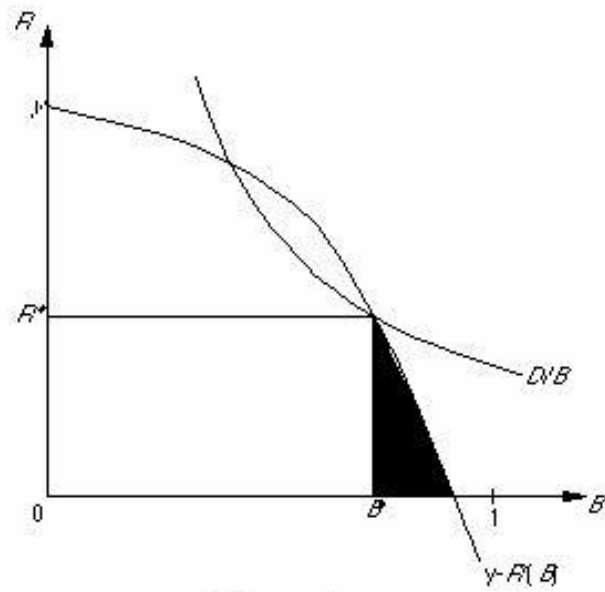


Figure 1

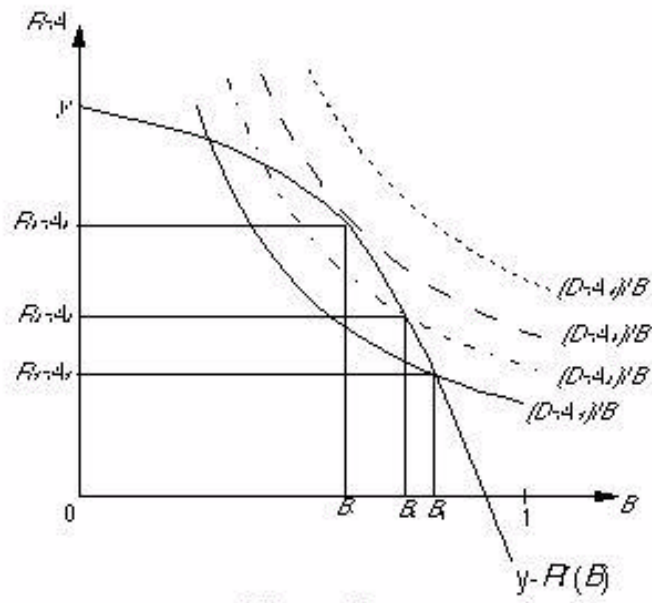


Figure 2