AN OPTIMAL PERSONAL BANKRUPTCY PROCEDURE AND PROPOSED REFORMS

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Abstract

We investigate a new approach to the reform of U.S. personal bankruptcy law in which Chapters 7 and 13 would be combined. The proposed reform obliges debtors in bankruptcy to use part of both their wealth and their future earnings to repay debt and therefore bases the obligation to repay in bankruptcy on debtors' ability to pay from both sources. An important function of personal bankruptcy is to provide partial wealth insurance for risk-averse debtors by discharging some debt when debtors' ability to repay turns out to be low. However, the current bankruptcy system encourages debtors to file for bankruptcy even when their ability to repay is high. The proposed reform maintains the insurance function of bankruptcy but reduces debtors' incentive to take advantage of the system. Using simulation techniques, we investigate the properties of a bankruptcy reform in which both the wealth exemption and the postbankruptcy earnings exemption are optimized. We show that the proposed reform improves efficiency relative to the current system.

THE United States is extremely unusual in having very prodebtor bankruptcy laws and, alone among the industrialized countries, it has a high and rapidly rising bankruptcy filing rate. The total number of bankruptcy filings rose from under 300,000 per year in 1984 to 1.1 million in 1996 and about 1.4 million in 1997.[1] Lenders' losses as a result of bankruptcy filings have been estimated at over $44 billion in 1997.[2] Because of concern about the soaring bankruptcy filing rate, a number of bankruptcy reforms have re-

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[1] Bankruptcy filing data are taken from the administrative office of the U.S. courts and from the *Statistical Abstract of the U.S.*, various editions.

[2] See Mark Lauritano, The Financial Cost of Personal Bankruptcy (consulting study, WEFA Group, Burlington, Mass., 1998).

[*Journal of Legal Studies*, vol. XXIX (January 2000)]
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cently been proposed. Most of these proposals are seriously flawed. The National Bankruptcy Review Commission's recent report proposed large increases in bankruptcy exemptions, which would have encouraged many additional debtors to file for bankruptcy.[3] The bankruptcy reform legislation introduced by George Gekas (R.-Pa.), which was passed by the House of Representatives in both 1998 and 1999, would go in the opposite direction by strongly discouraging bankruptcy filings.[4] This legislation would force debtors in bankruptcy whose income is above the median to use 100 percent of their postbankruptcy earnings above a predetermined expense formula to repay their debt. Such a plan would give some debtors who file for bankruptcy a strong incentive to quit their jobs—an outcome not in the interest of either debtors or creditors.[5]

A key aspect of current U.S. bankruptcy law is that there are two separate personal bankruptcy procedures, known as Chapter 7 and Chapter 13, and debtors are allowed to choose between them.[6] Under both procedures, debtors who file for bankruptcy receive a discharge from most types of unsecured debt. Under Chapter 7, debtors do not have to give up any of their postbankruptcy earnings, but they are obliged to use all of their assets above an exemption level to repay their debt. Under Chapter 13, debtors are not required to give up any of their assets, but they must propose a plan to use part of their future earnings for 3 years to repay debt. Because debtors are allowed to choose between the two chapters and because most debtors would not be obligated to repay anything under Chapter 7, most bankruptcy filings occur under Chapter 7. As a result, few debtors in bankruptcy are required to use either their assets or their future income to repay debt.

[3] National Bankruptcy Review Commission, Bankruptcy: The Next Twenty Years (National Bankruptcy Review Commission final report, October 20, 1997). See Scott Fay, Eric Hurst, & Michelle J. White, The Bankruptcy Decision: The Roles of Financial Benefit and Stigma (Working paper, Univ. Mich., Dep't Economics 1998), for an analysis of the effect of adopting the commission's exemption proposals.

[4] The bills are H.R. 3150, 105th Cong., 2d Sess. (1998), and H.R. 833, 106th Cong., 1st Sess. (1999).

[5] See Eric A. Posner, Should Debtors Be Forced into Chapter 13? Loy. L.A. L. Rev. (in press), for an analysis. Norway has a consumer bankruptcy system similar to H.R. 3150 in that it requires consumers to use 100 percent of postbankruptcy income above a fixed amount to repay debt. See Hans P. Graver, Consumer Bankruptcy: A Right or a Privilege? 20 J. Consumer Pol'y 161 (1997).

[6] Under § 707(b) of the U.S. Bankruptcy Code, Chapter 7 bankruptcy filings can be dismissed if the filing constitutes a ''substantial abuse'' of Chapter 7. But dismissals are rare and usually involve more than just strategic attempts by debtors to avoid repaying their debt. The Gekas bill would strengthen § 707(b) by substituting a formula to determine whether debtors would be permitted to file under Chapter 7. See Posner, *supra* note 5, for discussion.

In addition, debtors who plan for bankruptcy in advance can shift assets from nonexempt to exempt categories and therefore increase the amount of assets that are exempt. This means that well-off debtors often benefit much more than poor debtors from filing for bankruptcy; that is, the financial benefit of bankruptcy is very inequitably distributed. Michelle White has shown that up to one-third of U.S. households could benefit financially from filing for bankruptcy if they plan strategically and that the financial benefit from filing for bankruptcy is much greater for well-off debtors.[7]

In this paper, we investigate a proposed reform of U.S. bankruptcy law that combines Chapters 7 and 13. Debtors filing for bankruptcy would be obliged to use part of both their wealth and their future earnings to repay debt, but there would be exemptions for both. An advantage of the proposed reform is that—unlike the current Chapters 7 and 13—it bases debtors' obligation to repay on their ability to pay. Since ability to pay depends on both wealth and future earnings, the proposed reform requires that debtors use part of both—rather than part of one or the other—to repay debt. Another advantage of the proposed reform is that it would greatly improve equity by concentrating the benefit of filing for bankruptcy on households having the lowest ability to pay.[8]

A third advantage of the proposed reform—which we concentrate on in this paper—is that it would improve efficiency relative to the current bankruptcy system. An important role of bankruptcy is that of an insurance system that benefits risk-averse consumers by discharging some of their debt when their ability to repay turns out to be low. But the current bankruptcy system encourages debtors to behave strategically by filing for bankruptcy even when their ability to repay is high. The proposed reform reduces debtors' incentive to behave strategically, while still preserving bankruptcy's insurance function. While it requires that debtors use part of their postbankruptcy earnings to repay debt, we show that it does not give debtors an incentive to greatly reduce their labor supply. Our major finding is that the proposed reform increases efficiency in a wide variety of circumstances.

Section II briefly reviews the literature on personal bankruptcy. In Section III, we describe our model of the current bankruptcy system and the proposed reform. Section IV describes the functional forms and parameter values that we use in the simulation, and Section V discusses the results. Section VI concludes.

[7] See Michelle J. White, Why It Pays to File for Bankruptcy: A Critical Look at Incentives under U.S. Bankruptcy Laws and a Proposal for Change, 65 U. Chi. L. Rev. 685 (1998).

[8] See *id.* for analysis of the equity effects of the proposed reform.

I. Literature Review

In addition to the recent legislative proposals mentioned in the introduction, there have also been several proposals in the legal academic literature for reform of personal bankruptcy. William Vukowich argued that more debtors should file under Chapter 13 rather than Chapter 7 and that Chapter 7 bankruptcy exemptions should be reduced in order to encourage debtors to switch.[9] William Whitford proposed that the Chapter 13 bankruptcy procedure should be abolished and that all personal bankruptcy filings should be under Chapter 7. His argument is that debtors are unable to make an informed, self-interested choice between Chapters 7 and 13 and that, even if they could, filing under Chapter 13 is rarely in the debtors' interest.[10] Thomas Jackson questioned the justification for exempting 100 percent of postbankruptcy income in the basic personal bankruptcy procedure, Chapter 7, although he did not propose any specific bankruptcy reform. He argued that income below some predetermined minimum level, rather than all income, ought to be protected by bankruptcy law. However, he also argued that, of the various forms of wealth, earnings are most deserving of bankruptcy protection because they are derived from human capital and human capital is the least diversifiable of all forms of capital.[11]

There is a literature that discusses justifications for having a bankruptcy procedure and for making it mandatory, so that debtors cannot contract out of the right to file for bankruptcy. One justification for bankruptcy is that it provides partial wealth insurance, which makes consumers better off, assuming that they are risk averse. Consumers wish to borrow in order to smooth consumption over time, particularly when they expect their incomes to rise in the future. But future income is risky because, for example, consumers may lose their jobs. Private insurers are unwilling to provide insurance against loss of income or wealth, since moral hazard considerations suggest that adverse outcomes are more likely to occur if consumers are insured against the consequences. While bankruptcy does not insure consumers against risks such as that of losing their jobs, it reduces the loss associated with these events by discharging debt when they occur.[12] An-

[9] William T. Vukowich, Reforming the Bankruptcy Reform Act of 1978: An Alternative Approach, 71 Geo. L. J. 1129 (1983).

[10] William C. Whitford, Has the Time Come to Repeal Chapter 13? 65 Ind. L. J. 85 (1989).

[11] Thomas Jackson, The Logic and Limits of Bankruptcy Laws 254 (1986).

[12] See Samuel A. Rea, Arm-Breaking, Consumer Credit, and Personal Bankruptcy, 22 Econ. Inquiry 188 (1984); and White, *supra* note 7. Barry Adler, Ben Polak, & Alan Schwartz, Regulating Consumer Bankruptcy: A Theoretical Inquiry (Working paper, Yale Univ. 1999), also examine the insurance function of bankruptcy. Their model stresses the effect of bankruptcy on debtors' ex ante level of effort and also examines the effect of loans being collateralized and debtors' incentive to reaffirm debt after filing for bankruptcy.

other justification for preventing consumers from contracting out of bankruptcy is that the state provides welfare in order to ensure that people do not live in poverty. If consumers borrow to make risky investments and creditors were allowed to collect even when the investments turned out badly, then consumers might end up in poverty, and the state would be forced to provide them with welfare. Therefore, preventing consumers from giving up the right to file for bankruptcy makes lenders less likely to lend to finance risky investments.[13]

In other research on personal bankruptcy, Frank Buckley discusses explanations for the prodebtor tilt of U.S. bankruptcy policy,[14] Reint Gropp, Karl Scholz, and Michelle White examine the effect of bankruptcy exemptions on supply and demand for consumer credit,[15] and Andrea Repetto shows that higher bankruptcy exemptions cause households to save less.[16] There are also a number of recent empirical papers that explain the number of bankruptcy filings.[17] Teresa Sullivan, Elizabeth Warren, and Jay Westbrook discuss the characteristics of a sample of personal bankruptcy filings.[18]

II. The Model

In this section we present our model of the bankruptcy system. The model is more complicated than necessary to describe the current U.S. bankruptcy system, but we also use it to analyze our proposed bankruptcy reform. We first discuss the model when all consumers behave nonstrategically and then introduce strategic behavior (moral hazard/adverse selection).[19]

[13] Eric A. Posner, Contract Law in the Welfare State: A Defense of the Unconscionability Doctrine, Usury Laws, and Related Limitations on the Freedom to Contract, 24 J. Legal Stud. 283 (1995).

[14] Frank H. Buckley, The American Fresh Start, 4 S. Cal. Interdisciplinary L. J. 67 (1994).

[15] Reint Gropp, J. Karl Scholz, & Michelle J. White, Personal Bankruptcy and Credit Supply and Demand, 112 Q. J. Econ. 217 (1997).

[16] Andrea Repetto, Personal Bankruptcies and Individual Wealth Accumulation (Working paper, Mass. Inst. Tech. 1998).

[17] See Ian Domowitz & Thomas Eovaldi, The Impact of the Bankruptcy Reform Act of 1978 on Consumer Bankruptcy, 36 J. Law & Econ. 803 (1993); Ian Domowitz & Robert L. Sartain, Determinants of the Consumer Bankruptcy Decision, 54 J. Fin. 403 (1999); Frank H. Buckley & Margaret F. Brinig, The Bankruptcy Puzzle, 27 J. Legal Stud. 187 (1998); Fay, Hurst, & White, *supra* note 3; and David Gross & Nicholas Souleles, Explaining the Increase in Bankruptcy and Delinquency: Stigma versus Risk-Composition (Working paper, Univ. Chicago, Grad. School Bus. 1998).

[18] Teresa Sullivan, Elizabeth Warren, & Jay Westbrook, As We Forgive Our Debtors (1989).

[19] In our discussion of the current U.S. bankruptcy system, we assume that all bankruptcy filings occur under Chapter 7. This is because debtors always have the right to file under Chapter 7, and usually they are obliged to repay less under Chapter 7. Therefore, the amount debtors are willing to repay under Chapter 13 is no more than the amount they would be obliged to repay if they filed under Chapter 7. For example, a debtor who has $10,000 in

A. *Nonstrategic Behavior*

All consumers are assumed to be identical as of period 1, so that we have a representative agent model. Suppose in period 1 that consumers have wealth W_1, work hours N_1, and earnings Y_1. Earnings are assumed to be proportional to work hours, or $Y_1 = wN_1$, where w is the wage rate. The values of W_1, N_1, w, and Y_1 are all known in advance and certain. In period 2, consumers have wealth W_2, work hours N_2, and earnings $Y_2 = wN_2$. Period 2 wealth is uncertain and is distributed according to the known wealth distribution, $f(W_2)$. Each consumer's actual period 2 wealth W_2 is an independent draw from the distribution $f(W_2)$. Period 2 work hours are determined endogenously.

In period 1, the representative consumer borrows a constant, endogenously determined amount, B, at an endogenously determined interest rate r. The loan is assumed to be unsecured. For simplicity, we assume that consumers have no prior loans.[20] In period 2, the loans come due. At the beginning of period 2, consumers learn their wealth W_2, and they then decide whether to repay their debt in full or to file for bankruptcy. The costs of filing for bankruptcy, which include bankruptcy court filing fees, lawyers' fees, and the cost of bankruptcy stigma, are assumed to be a constant proportion c of period 2 wealth.[21] Suppose E denotes the wealth exemption in bankruptcy in the debtor's state of residence; E is assumed to be a fixed dollar amount that combines the state's exemptions for all types of assets.[22] If consumers file for bankruptcy, they keep all their wealth if $W_2 \leq E$, but they must give up their nonexempt wealth $W_2 - E$ if $W_2 > E$. Thus, their net period 2 wealth is $W_2(1 - c) - \max[W_2 - E,0]$ if they file for bankruptcy. If they do not file for bankruptcy, then they repay their debt in full, so that their net period 2 wealth becomes $W_2 - B(1 + r)$.[23]

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nonexempt assets would be obliged to repay \$10,000 to creditors in a Chapter 7 bankruptcy filing and, therefore, would be willing to repay the equivalent of \$10,000 from future earnings, but no more, in a Chapter 13 bankruptcy filing. A debtor who has no nonexempt assets would be willing to repay only a token amount from future earnings in a Chapter 13 bankruptcy filing. Because of this close connection between the two chapters, we assume that all bankruptcy filings under the current bankruptcy system occur under Chapter 7.

[20] See David S. Bizer & Peter M. DeMarzo, Sequential Banking, 100 J. Pol. Econ. 41 (1992), for discussion of a model in which the debtor borrows from more than one creditor.

[21] The assumption that bankruptcy costs are a constant proportion of wealth is made because the cost of bankruptcy stigma presumably rises with wealth, while filing fees and lawyers' fees are a declining or constant proportion of wealth.

[22] States generally have separate exemptions for equity in owner-occupied homes, equity in vehicles, personal property, the cash value of insurance policies, and retirement accounts. See the discussion of strategic behavior below.

[23] We ignore the possibility that households default but do not file for bankruptcy. See Michelle J. White, Why Don't More Households File for Bankruptcy? 14 J. L. Econ. & Org. 205 (1998), for a model that considers this possibility.

We also define an exemption for postbankruptcy earnings, denoted e, which is a proportion of period 2 earnings Y_2. Postbankruptcy earnings are completely exempt under the current Chapter 7 bankruptcy procedure, so that $e = 1$. But under the proposed reform, debtors would be obliged to use a portion of their postbankruptcy earnings to repay debt, so that $e < 1$. Therefore, consumers' period 2 net earnings are eY_2 if they file for bankruptcy, where $e \leq 1$, and Y_2 if they do not file for bankruptcy. In the theoretical discussion, we treat e as a fixed proportion of Y_2, but in the simulations we also consider a bankruptcy exemption that is a declining proportion of Y_2. The fraction of period 2 earnings that is not exempt in bankruptcy, $(1 - e)$, is also referred to as the ''bankruptcy tax'' rate.

Suppose P_t denotes net purchasing power in period t. In period 1, net purchasing power equals the sum of wealth plus earnings plus the amount borrowed, or $P_1 = W_1 + Y_1 + B$. In period 2, net purchasing power equals the sum of wealth plus earnings minus repayment of debt, if any, minus bankruptcy costs if consumers file for bankruptcy. If consumers file for bankruptcy, then $P_2 = W_2 + eY_2 - cW_2$ if $W_2 < E$ and $P_2 = E + eY_2 - cW_2$ if $W_2 \geq E$. If consumers avoid bankruptcy, then $P_2 = W_2 + Y_2 - B(1 + r)$. There is a level of period 2 purchasing power at which consumers are just indifferent between filing versus not filing for bankruptcy, or $E + eY_2 - cW_2 = W_2 + Y_2 - B(1 + r)$. Suppose $\widetilde{W}_2$ denotes the level of period 2 wealth that satisfies this condition, so that consumers are indifferent between filing versus not filing for bankruptcy when $W_2 = \widetilde{W}_2$. Solving, we get

$$\widetilde{W}_2 = \frac{E + B(1 + r) - (1 - e)Y_2}{(1 + c)}. \tag{1}$$

Figure 1 shows consumers' period 2 wealth W_2 on the horizontal axis. The solid line is consumers' period 2 net purchasing power after repaying their debt and/or filing for bankruptcy, assuming that period 2 earnings Y_2 equal zero. The line has three segments. In the right-most segment where $W_2 \geq \widetilde{W}_2$, consumers do not file for bankruptcy and they repay the debt in full. In the middle and left-most segments where $W_2 < \widetilde{W}_2$, consumers file for bankruptcy. In the left-most segment, $W_2 \leq E$, so that all of consumers' wealth is exempt in bankruptcy. In the middle segment, $E < W_2 < \widetilde{W}_2$, so that consumers keep only the amount of wealth E and give up $W_2 - E$ for repayment to lenders.

Now suppose period 2 earnings Y_2 are positive and suppose the bankruptcy reform is in effect, so that $e < 1$. The dashed line in Figure 1 shows consumers' period 2 net purchasing power in this case. Now if consumers file for bankruptcy, they must use the fraction $(1 - e)$ of their period 2

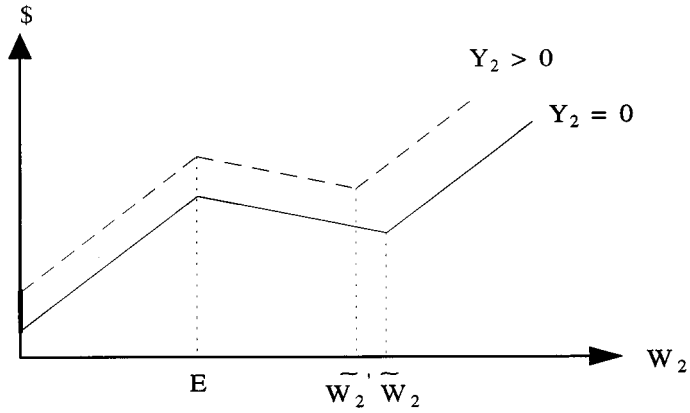

FIGURE 1.—Net purchasing power in period 2

earnings to repay their debt. Therefore, their period 2 net purchasing power rises by Y_2 if they avoid bankruptcy and by the smaller amount eY_2 if they file for bankruptcy. Because consumers' earnings are taxed to repay debt in bankruptcy, filing for bankruptcy becomes less attractive. In Figure 1, the level of period 2 wealth at which consumers are indifferent between filing versus not filing for bankruptcy shifts to the left, from $\widetilde{W}_2$ to $\widetilde{W}_2'$. As a result, consumers' probability of filing for bankruptcy falls.[24]

Figure 2 illustrates the effect of varying the wealth and earnings exemptions in bankruptcy, E and e. In the top panel, the wealth exemption is assumed to fall from E to $E' < E$. The solid line shows net purchasing power when the wealth exemption is E, and the dashed line shows it when the wealth exemption is E'. The reduction in the wealth exemption causes net purchasing power to fall when W_2 is in the intermediate region where $E' \leq W \leq \widetilde{W}_2$, as shown by the shaded area. In the lower panel, the earnings exemption is assumed to fall from e to e'. The solid line shows net purchasing power when the earnings exemption is e, and the dashed line shows it when the earnings exemption is $e' < e$. Consumers' net purchasing power falls whenever $0 \leq W_2 \leq \widetilde{W}_2$, as shown by the shaded area. Thus, a reduction in the earnings exemption e lowers consumers' net purchasing power when it is at its lowest level, while a reduction in the wealth exemption lowers net purchasing power only when W_2 is above E'. If consumers are risk averse, they will tend to prefer a reduction in the wealth exemption E to a reduction in the earnings exemption e, assuming that both cost consumers the same expected amount, because the reduction in E does not lower

[24] This can also be seen by noting that $\widetilde{W}_2$ and Y_2 are negatively related in equation (1).

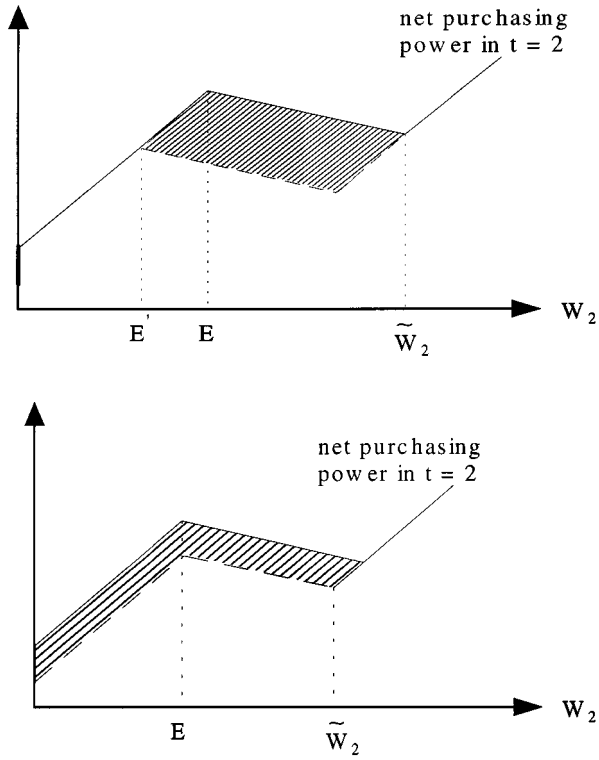

FIGURE 2.—Effect of reducing the wealth exemption E or the earnings exemption e for nonstrategic consumers.

net purchasing power when W_2 is lowest and the marginal utility of net purchasing power is highest.[25]

The representative consumers' utility function in period t is $U(P_t, N_t)$, where N_t denotes hours of work in period t. We assume that additional purchasing power has positive but diminishing marginal utility, or $U_P > 0$ and $U_{PP} < 0$, so that consumers are risk averse. We also assume that utility is negatively related to work effort and that there is increasing marginal disutility from work effort, or $U_N < 0$, $U_{NN} < 0$. Finally, we assume that purchasing power and work hours are additively separable in the utility function, so that $U_{PN} = 0$.

[25] Note that both exemption-level changes would also cause lenders to raise the interest rate, and this would cause purchasing power to fall slightly when consumers do not file for bankruptcy. Incorporating this effect would not change the results discussed here.

The representative consumer's expected utility function as of period 1 is

$$\begin{aligned} EU = {} & U(W_1 + wN_1 + B, N_1) \\ & + \int_0^E U[W_2(1 - c) + ewN_2, N_2]f(W_2)dW_2 \\ & + \int_E^{\tilde{W}_2} U[E - cW_2 + ewN_2, N_2]f(W_2)dW_2 \\ & + \int_{\tilde{W}_2}^{\infty} U[W_2 - B(1 + r) + wN_2, N_2]f(W_2)dW_2. \end{aligned} \tag{2}$$

The first term in equation (2) is consumers' utility level in period 1. The second through fourth terms are consumers' expected utility levels in period 2 if they file for bankruptcy and repay nothing, if they file for bankruptcy and repay part of their debt, and if they do not file for bankruptcy, respectively, where each term is weighted by its probability of occurring. (The second through fourth terms correspond to the period 2 wealth regions as represented by the three line segments in Figures 1 and 2.) For simplicity, consumers' rate of discount between periods 1 and 2 is assumed to be zero.

Consumers are assumed to determine the amount they borrow, B, and the number of work hours they work in period 2, N_2, by maximizing expected utility (equation (2)). Consumers make both of these decisions as of period 1, that is, before they learn their actual period 2 wealth. Because all consumers are identical as of period 1, this means that they all borrow the same amount and they all choose to work the same number of hours in period 2. Since each consumer's demand for credit has only a negligible effect on overall credit market conditions, consumers treat the interest rate r as fixed in making these decisions.

Lenders are assumed to be risk neutral, and the lending industry is assumed to be competitive, so that lenders make zero profits. In order for lenders to be willing to lend, expected repayment, evaluated as of period 1, must just compensate lenders for their opportunity cost of funds, which is denoted r_f. The zero profit condition is

$$\begin{aligned} B(1 + r_f) = {} & \int_0^E [(1 - e)Y_2]f(W_2)dW_2 \\ & + \int_E^{\tilde{W}_2} [W_2 - E + (1 - e)Y_2]f(W_2)dW_2 \\ & + \int_{\tilde{W}_2}^{\infty} B(1 + r)f(W_2)dW_2. \end{aligned} \tag{3}$$

Here the first term on the right-hand side is expected repayment in period 2 when consumers file for bankruptcy and their period 2 wealth is below the exemption level ($W_2 \leq E$), so that they are only obliged to repay from period 2 earnings. The middle term on the right is expected repayment when consumers file for bankruptcy and their period 2 wealth is above the exemption level ($E < W_2 \leq \widetilde{W}_2$), so that they must repay from both earnings and wealth. The last term corresponds to expected repayment when consumers avoid bankruptcy and repay in full.

If the government raises/lowers either the wealth exemption E or the postbankruptcy earnings exemption e, then lenders raise/lower the interest rate, so that the zero profit condition remains satisfied. The optimal wealth exemption level occurs where risk-averse consumers' gain from having more complete insurance when E rises is just offset by their loss from paying higher expected bankruptcy costs because they are more likely to file for bankruptcy. If bankruptcy costs were zero and consumers were risk averse, then the optimal wealth exemption would be very high. But if consumers were risk neutral and bankruptcy costs were positive, then the optimal wealth exemption would be zero. The optimal earnings exemption level is zero whenever there is no strategic behavior.[26]

B. Strategic Behavior

Just as consumers have an incentive to rearrange their income and wealth to minimize taxes, they also have an incentive to rearrange their wealth so as to get maximum financial benefit from the bankruptcy system. As in the case of tax planning, there are a number of bankruptcy planning strategies, and they range from the perfectly legal to the legally doubtful to the obviously fraudulent. Assume that there are two types of consumers. Consumers of one type are assumed to make their bankruptcy decisions nonstrategically, according to the model just discussed. Consumers of the other type are assumed to make their bankruptcy decisions strategically. Recent empirical evidence concerning the bankruptcy filing decision supports the assumption that some consumers behave strategically while others behave nonstrategically.[27]

[26] See Fay, Hurst, & White, *supra* note 3, for proofs.

[27] In a recent empirical study of households' bankruptcy filing decisions, Scott Fay, Erik Hurst, and I tested the hypothesis of strategic behavior that households are more likely to file for bankruptcy when their financial benefit from filing increases and the hypothesis of nonstrategic behavior that households are more likely to file for bankruptcy when adverse events occur that reduce their ability to repay their debt. We found that higher financial benefit was positively and significantly related to the probability of filing for bankruptcy, but income loss was also positively and significantly related to the probability of filing. This suggests that some consumers behave strategically in making their bankruptcy decisions, while others behave nonstrategically. See Fay, Hurst, & White, *supra* note 3.

As a simple means of representing a variety of bankruptcy planning strategies, we assume that strategic consumers arrange their period 2 wealth so that if they file for bankruptcy, a fraction h of their period 2 wealth W_2 is hidden from the bankruptcy trustee, where $0 < h < 1$.[28] Because part of their period 2 wealth is hidden from the bankruptcy trustee, strategic consumers repay less than nonstrategic consumers when both types file for bankruptcy. However, we assume that neither type of consumer hides any of his or her period 2 earnings. This is because it is much easier for trustees to verify consumers' earnings than it is for bankruptcy trustees to verify consumers' wealth. Period 2 earnings can be verified by requiring that consumers produce copies of their income tax returns, but there is no analogous requirement that wealth be reported on a tax return.[29]

Now consider strategic consumers' bankruptcy decision. If strategic consumers file for bankruptcy, they repay nothing from period 2 wealth if their nonhidden wealth $(1 - h)W_2$ is less than E, or if $W_2 \leq E/(1 - h)$. In this case, they repay an amount $(1 - e)Y_2$ from period 2 earnings, and they pay bankruptcy costs of $c(1 - h)W_2$, so that their period 2 net purchasing power is $W_2[1 - c(1 - h)] + eY_2$. If strategic consumers file for bankruptcy, then they repay part of their debt if their nonhidden wealth $(1 - h)W_2$ is greater than E. In this case, they repay $(1 - h)W_2 - E + (1 - e)Y_2$ from period 2 wealth and earnings, and they pay bankruptcy costs of $c(1 - h)W_2$, so that their period 2 net purchasing power becomes $hW_2 + E - c(1 - h)W_2 + eY_2$. Finally, if strategic consumers avoid bankruptcy, their period 2 net purchasing power is the same as that of nonstrategic consumers, or $W_2 - B(1 + r) + Y_2$. The level of period 2 wealth at which strategic consumers are indifferent between filing versus not filing for bankruptcy is $\tilde{W}_2/(1 - h)$. Because $\tilde{W}_2/(1 - h)$ is greater than $\tilde{W}_2$, strategic consumers file for bankruptcy at higher levels of period 2 wealth than do nonstrategic consumers.

[28] Because states have separate exemptions for different types of assets, many bankruptcy planning strategies involve converting assets from nonexempt to exempt forms. An example is for consumers to use nonexempt financial assets to reduce the amount they owe on their mortgages, assuming that they own homes and their home equity is less than their state's homestead exemption. Another strategy is for consumers to purchase additional life insurance if they live in a state with a high exemption for life insurance. An example of a fraudulent strategy is for consumers to transfer ownership of financial assets to relatives. See White, *supra* note 7, for discussion of various bankruptcy strategies and calculations of the proportion of households that would benefit from filing for bankruptcy if they used these strategies.

[29] Consumers can underreport their incomes on their tax returns if they are self-employed, but doing so subjects them to possible penalties for tax evasion in addition to whatever penalties might be imposed for underreporting income in the context of a bankruptcy filing. An additional reason for our assumption that consumers cannot hide earnings is that hiding earnings has the same effect in the model as raising the earnings exemption in bankruptcy (or lowering the bankruptcy tax rate). In the simulation we investigate a range of values of the earnings exemption.

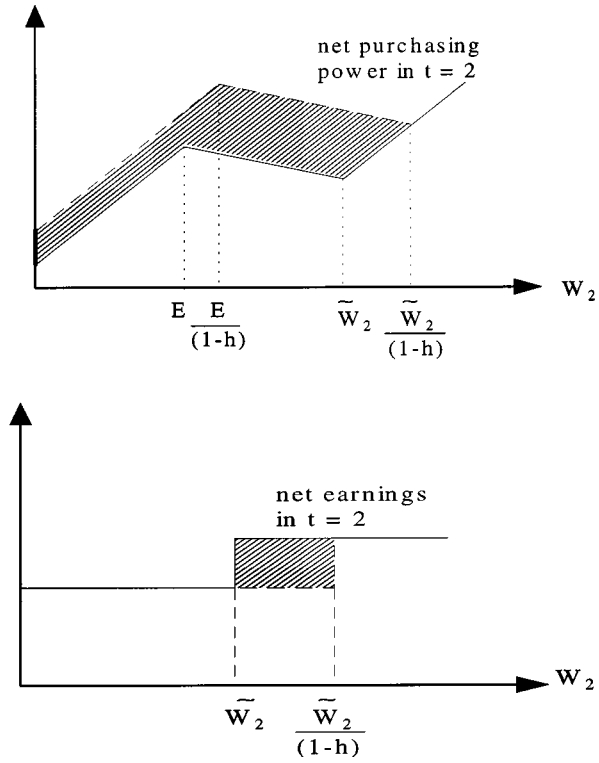

FIGURE 3.—Effect of strategic behavior on net period 2 purchasing power

In the top panel of Figure 3, the solid line represents nonstrategic consumers' net period 2 wealth, while the dashed line represents strategic consumers' net period 2 wealth. When consumers behave strategically, they are more likely to file for bankruptcy. Strategic consumers also have higher expected net period 2 purchasing power than nonstrategic consumers whenever they file for bankruptcy, that is, whenever their period 2 wealth is less than $\widetilde{W}_2/(1 - h)$. The shaded area in the top panel of Figure 3 shows the increase in consumers' expected net purchasing power in period 2, when they behave strategically. The more intense is strategic behavior (higher h), the greater the increase in strategic consumers' probability of filing for bankruptcy, and the greater their expected gain from behaving strategically.

However, if the bankruptcy reform is in effect, behaving strategically reduces consumers' period 2 net earnings. Both types of consumers pay the bankruptcy tax of $(1 - e)Y_2$ if they file for bankruptcy, but strategic consumers are more likely to pay the tax because they file for bankruptcy more often. The solid and dashed lines in the bottom panel of Figure 3 show non-

strategic and strategic consumers' net period 2 earnings after paying the bankruptcy tax, respectively. If consumers behave strategically, their period 2 net earnings fall by an amount $(1 - e)Y_2$ if $\widetilde{W}_2 \leq W \leq \widetilde{W}_2/(1 - h)$. The rectangular shaded area shows this loss.

In period 1, both types of consumers apply for loans. Strategic consumers are assumed to apply for the same loan amount B that nonstrategic consumers wish to borrow. Lenders are assumed to be unable to identify whether individual consumers are strategic or nonstrategic, as long as both types apply to borrow the same amount. They therefore lend B and charge an interest rate r to both types.[30] Strategic consumers, like nonstrategic consumers, decide on their period 2 labor supply as of period 1. However, because strategic consumers have higher expected net purchasing power in period 2 and a different expected utility function from nonstrategic consumers (see the discussion below), their period 2 labor-supply level differs from that of nonstrategic consumers. Strategic consumers' period 2 labor supply is denoted N_2^s, while nonstrategic consumers' period 2 labor supply is still denoted N_2.

Consumers who behave strategically to take advantage of bankruptcy are assumed to bear a cost that is similar to the cost of cheating on one's taxes. The cost of strategic behavior is assumed to vary across consumers, because individual consumers vary in the importance that they place on behaving ethically. Suppose individual strategic consumers are indexed by i. The cost of behaving strategically, measured in units of utility, is denoted S_i for strategic consumer i. The distribution of S_i across all strategic consumers is $g(S_i)$.[31]

The expected utility function of an arbitrary consumer i who behaves strategically is

$$\begin{aligned} EU_i^s = {} & U(W_1 + wN_1 + B, N_1) \\ & + \int_0^{E/(1-h)} U[W_2(1 - c(1 - h)) + ewN_2^s, N_2^s] f(W_2) dW_2 \\ & + \int_{E/(1-h)}^{\widetilde{W}_2/(1-h)} U[hW_2 + E - c(1 - h)W_2 + ewN_2^s, N_2^s] f(W_2) dW_2 \\ & + \int_{\widetilde{W}_2/(1-h)}^{\infty} U[W_2 - B(1 + r) + wN_2^s, N_2^s] f(W_2) dW_2 - S_i. \end{aligned} \tag{4}$$

[30] The assumption that a pooling equilibrium prevails in the credit market requires strategic consumers to be better off if they borrow the same amount as nonstrategic consumers than they would be if they applied to borrow more than nonstrategic consumers and, thus, allowed lenders to identify their types. In the simulations discussed below, we verify that this condition always holds.

[31] An alternate interpretation of the cost of strategic behavior would be that it represents the extra cost of legal or accounting fees when consumers behave strategically.

The four terms on the right-hand side of equation (4) have the same interpretation as the four terms on the right-hand side of equation (2). Note that strategic consumers' expected utility function is the same as nonstrategic consumers' expected utility function when $h = 0$ and $S_i = 0$.

Now consider consumers' decisions whether or not to behave strategically. Consumers make this decision in period 1. For consumer *i*, the gain from behaving strategically is the difference between equation (4) and equation (2). There is a critical level of S_i, denoted $\bar{S}$, such that a consumer whose cost of behaving strategically equals $\bar{S}$ is indifferent between behaving strategically or nonstrategically. All consumers whose cost of behaving strategically is less than $\bar{S}$ choose to behave strategically, and all consumers whose cost of behaving strategically is $\bar{S}$ or higher choose to behave nonstrategically. The proportion of consumers that behaves strategically is denoted p_s, where $p_s = \int_0^{\bar{S}} g(S_i)dS_i$.

Lenders' zero profit condition when there is strategic behavior becomes

$$\begin{aligned} B(1+r_f) = (1-p_s)\Bigg[&\int_0^{E}(1-e)wN_2 f(W_2)dW_2 \\ &+\int_{E}^{\tilde{W}_2}(W_2 - E + (1-\mathrm{e})wN_2)f(W_2)dW_2 \\ &+\int_{\tilde{W}_2}^{\infty} B(1+r)f(W_2)dW_2\Bigg] \\ +p_s\Bigg\{&\int_0^{E/(1-h)}(1-e)wN_2^{\mathrm{s}} f(W_2)dW_2 \\ &+\int_{E/(1-h)}^{\tilde{W}_2/(1-h)}[(1-h)W_2 - E + (1-e)wN_2^{\mathrm{s}}]f(W_2)dW_2 \\ &+\int_{\tilde{W}_2/(1-h)}^{\infty} B(1+r)f(W_2)dW_2\Bigg\}. \end{aligned} \tag{5}$$

Here, the set of terms in large square brackets represents expected repayment by nonstrategic consumers, and the set of terms in large curly braces represents expected repayment by strategic consumers. Note that equation (5) is the same as equation (3) when either the proportion of consumers that chooses strategic behavior is zero ($p_s = 0$) or the proportion of period 2 wealth that strategic consumers hide is zero ($h = 0$).

When there is no strategic behavior, all consumers are identical and, therefore, the value of the expected utility function in equation (2) becomes the social welfare function. But when strategic behavior is introduced, the

issue arises as to what the social welfare criterion should be and how it should weight the preferences of nonstrategic versus strategic consumers. We use the expected utility function of nonstrategic consumers, equation (2), as the social welfare function. The reason for making this choice is that strategic behavior undermines the value of the bankruptcy system by making the wealth insurance that bankruptcy provides to borrowers more expensive. By using the expected utility function of nonstrategic consumers as the social welfare function, we implicitly assign a zero weight to strategic consumers' utility gain from behaving strategically.[32]

Under the current bankruptcy system, the only bankruptcy policy variable is the wealth exemption, *E;* under the proposed reform, the exemptions for both wealth and future earnings, *E* and *e*, are policy variables. The government decides on the value(s) of the bankruptcy policy variable(s) by maximizing the social welfare function. The model's equations are nonstrategic consumers' first-order conditions for *B* and N_2 (not shown), strategic consumers' first-order condition for N_2^s (not shown), lenders' zero profit condition (equation (5)), the condition determining when nonstrategic consumers file for bankruptcy (equation (1)), the condition determining the proportion of consumers that behaves strategically, and the first-order conditions for *E* and, where relevant, *e* (not shown). The endogenous variables in the model are *B*, *r*, N_2, N_2^s, $\tilde{W}_2$, p_s, *E*, and *e*. Rather than solve the model for *e*, we solve it for all of the other endogenous variables and then evaluate it over a range of values of *e*.

C. Summary

The main economic function of the bankruptcy system is to reduce the uncertainty that risk-averse consumers face by discharging debt when consumers' period 2 net purchasing power turns out to be low. But the current bankruptcy system encourages strategic behavior. Behaving strategically benefits consumers both by raising their expected net purchasing power in period 2 (as shown by the shaded area in the top panel of Figure 3) and by reducing the riskiness of their net purchasing power. But consumers who behave strategically bear the cost S_i, and they also pay higher expected bankruptcy costs because they file for bankruptcy more often. Consumers choose to behave strategically if these benefits exceed costs. The higher the

[32] Using a utilitarian social welfare function would be unreasonable in this context because it increases strategic consumers' weight in the social welfare function as strategic behavior becomes more intense (*h* rises), despite the fact that the harm to nonstrategic consumers increases as strategic behavior becomes more intense. See Frank A. Cowell, Cheating the Government: The Economics of Evasion, ch. 7 (1990), for discussion in the context of tax evasion.

proportion of consumers that behaves strategically (higher p_s) and/or the more intense is strategic behavior (higher h), the worse off are nonstrategic consumers. This is because lenders respond to strategic behavior by raising interest rates, and nonstrategic consumers are more likely to bear the higher interest cost by repaying their debt in full.

Now consider how adopting the proposed bankruptcy reform changes consumers' incentives. Assume that the level of E remains fixed when the reform is adopted. In this case the reform makes both types of consumers worse off, because they must pay the bankruptcy tax on earnings when they file for bankruptcy and because the tax makes period 2 net purchasing power more risky (as shown in the lower panel of Figure 2). But the reform makes nonstrategic consumers better off by discouraging strategic behavior, because strategic consumers file for bankruptcy more often and therefore are more likely to pay the bankruptcy tax. Adopting the reform also causes interest rates to fall, which benefits nonstrategic consumers more than strategic consumers. Now suppose the level of E is also allowed to vary when the bankruptcy reform is adopted. In this case the increase in the riskiness of net purchasing power caused by levying the bankruptcy tax can be offset by simultaneously raising the wealth exemption E. Thus the optimal bankruptcy reform may involve two changes: imposing a bankruptcy tax (that is, lowering the earnings exemption e) and raising the wealth exemption E. The simulation investigates whether adopting the reform is worthwhile, taking all of these factors into effect.

III. Functional Forms and Parameter Values

Period 1 labor supply, N_1, is assumed to be fixed at 6.8 hours per day. The wage rate per hour per year, w, is assumed to equal \$4,680. This value results from assuming a wage rate of \$18.00 per hour and 260 work days per year.[33] Period 1 wealth W_1 is assumed to be \$10,000. The function $f(W_2)$ has a log-normal distribution with LN(4.91212, 0.443878). Using these assumptions, W_2 has a mean value of \$150,000 and a standard deviation of \$70,000. We assume that the mean value of W_2 is much greater than the mean value of W_1, because consumers in this situation have a strong incentive to borrow in the first period in order to smooth their purchasing power over time. Thus the model can be thought of as representing consumers who are just entering the labor force in period 1 and tend to accumulate wealth over time.

[33] The hourly wage rate used here is higher than the average figure in the U.S. economy, which is about \$12.00. We use the higher figure in order to loosely represent the entire household's wage rate, where the average household has more than one worker.

The risk-free interest rate r_f is assumed to be .05, and bankruptcy costs are assumed to equal 10 percent of period 2 wealth, or $c = .1$. In time period t, the utility function is

$$U(P_t, N_t) = \log(P_t) - vN_t^{\mu},$$

where $1/(\mu - 1)$ is the elasticity of labor substitution. Following Kimball,[34] we assume that $\mu = 11$, and, therefore, the elasticity of labor supply is .1. The v represents the disutility of work and is a free parameter used for scaling the model. It takes the value $5.118 \times \exp[-11]$.[35]

The distribution of the cost of strategic behavior, $g(S_i)$, is also assumed to be lognormal, so that $g(S_i)$ is distributed as LN(1, 4.58926). These parameter values were selected so that the proportion of consumers that chooses to behave strategically is about .15 in the base case model with strategic behavior (column 2 of Table 1).

We run four sets of simulations. In the first simulation, we solve for the optimal value of E under the current bankruptcy system, assuming that there is no strategic behavior. Then, holding E constant, we allow consumers to choose between behaving strategically versus nonstrategically, and we introduce the bankruptcy reform. The assumption that the bankruptcy reform might be adopted but that the wealth exemption would remain unchanged is reasonable since if Congress adopted the reform proposal discussed here, it might continue the present procedure of allowing the states to set their own wealth exemptions in bankruptcy. Many states would probably respond by leaving their current exemptions unchanged. The bankruptcy tax rate on future earnings, $(1 - e)$, takes the predetermined value of zero under the current bankruptcy system and takes the values of 7 percent and 15 percent under the reform. We also vary the intensity of strategic behavior by assuming that the fraction of strategic consumers' period 2 wealth that is hidden from the bankruptcy trustee, h, takes values of 0, .1, .2, and .3. The second set of simulations repeats the first, except that we solve for the optimal wealth exemption level for each combination of values of $(1 - e)$ and h.

[34] Miles S. Kimball, The Quantitative Analytics of the Basic Neomonetarist Model, 27 J. Money Credit & Banking 1241 (1995).

[35] The v is assumed to take the value that would result if there were no uncertainty in the model, if there were no strategic behavior, if the current bankruptcy system were in effect, and if consumers were indifferent between filing versus not filing for bankruptcy. If we set the first-order condition for maximizing expected utility with respect to N_2 when households do not file for bankruptcy equal to zero, we get $w/[W_2 + wN_2 - B(1 + r)] = v\mu N_2^{\mu-1}$. We then substitute the condition under which households are indifferent between filing versus not filing for bankruptcy under the current bankruptcy system, which is $B(1 + r) = W_2(1 + c) - E$. Substituting the values given in the text for each of the parameters and a value of E of 15 percent of mean period 2 wealth, we get the value for v given in the text.

TABLE 1

SIMULATION RESULTS WITH FIXED E AND CONSTANT TAX RATE ON EARNINGS

A. CURRENT BANKRUPTCY SYSTEM WITH ZERO TAX RATE ($e = 1$)

	None (1)	Mild (2)	Medium (3)	Strong (4)
h	0	.1	.2	.3
p_s	0	.150	.192	.223
E ($)	20,310	20,310	20,310	20,310
B ($)	58,353	58,085	57,480	56,421
r	.084	.087	.093	.104
N_2, N_2^s	6.213, · · ·	6.209, 6.25	6.20, 6.23	6.19, 6.19
p_b, p_b^s	.095, · · ·	.094, .141	.093, .206	.091, .30
$EU = SWF$	**9.1206**	9.1191	9.1157	9.109

B. BANKRUPTCY REFORM WITH 7% TAX RATE ($e = .93$)

	None (1)	Mild (2)	Medium (3)	Strong (4)
h	0	.1	.2	.3
p_s	0	.141	.183	.214
E ($)	20,310	20,310	20,310	20,310
B ($)	56,981	56,779	56,314	55,452
r	.077	.079	.084	.094
N_2, N_2^s	6.22, · · ·	6.215, 6.24	6.209, 6.214	6.198, 6.181
p_b, p_b^s	.078, · · ·	.078, .118	.077, .18	.075, .26
$EU = SWF$	9.1204	**9.119289**	9.1165	9.111

C. BANKRUPTCY REFORM WITH 15% TAX RATE ($e = .85$)

	None (1)	Mild (2)	Medium (3)	Strong (4)
h	0	.1	.2	.3
p_s	0	.130	.172	.204
E ($)	20,310	20,310	20,310	20,310
B ($)	55,623	55,481	55,132	54,459
r	.070	.072	.076	.084
N_2, N_2^s	6.22, · · ·	6.219, 6.229	6.214, 6.203	6.205, 6.170
p_b, p_b^s	.0622, · · ·	.062, .096	.061, .15	.060, .23
$EU = SWF$	9.1200	9.1191	**9.116970**	9.112777*

NOTE.—"None," "mild," "medium," and "strong" describe the strategic behavior of consumers.
* When strategic behavior is strong ($h = .3$), the optimal bankruptcy tax rate is 55%. See text.

The third and fourth sets of simulations repeat the first and second, but we assume that the bankruptcy tax is a rising—rather than constant—proportion of period 2 earnings. The reason for analyzing a rising bankruptcy tax schedule is that, under federal law, creditors are allowed to garnish a rising proportion of debtors' wages outside of bankruptcy. If the bankruptcy reform proposal analyzed here were adopted, then the exemption for postbankruptcy earnings might take a form similar to the current limitations on wage garnishment outside of bankruptcy.[36] We also wish to explore whether the results of the simulation are sensitive to changes in the form of the bankruptcy tax. Specifically, we assume that $(1 - e) = \beta_1 \times \exp[\beta_2 Y_2]$, where $\beta_1 = .01$, $\beta_2 = .067$ or .093, and Y_2 is expressed in thousands of dollars. These values imply that the bankruptcy tax rate on the first dollar of postbankruptcy earnings is always 1 percent but that it rises to 7 percent or 15 percent, respectively, when earnings are approximately \$29,000. Thus, under the bankruptcy reform with the rising tax rate, the marginal tax rates are the same as in the analogous cases involving the constant tax rate, but the total dollar amounts that consumers repay from future earnings following bankruptcy are lower.[37]

IV. Results

A. *The Bankruptcy Reform with a Fixed Wealth Exemption*

Column 1 of panel A (Table 1) shows the results in the base case. Here, the current bankruptcy system is in effect ($e = 1$), and there is no strategic behavior ($p_s = 0$ and $h = 1$). The solution for the optimal wealth exemption, denoted E^*, turns out to be \$20,310. The equilibrium loan amount is $B = \$58{,}353$, and the equilibrium interest rate is $r = .084$. Labor supply in period 2, N_2, is 6.213 hours per day, which means that postbankruptcy earnings are (6.213)(\$4,680), or approximately \$29,000. Consumers' probability of filing for bankruptcy, denoted p_b, is .095.[38] In all the other columns of Table 1, E remains fixed at its base case value of \$20,310.

[36] Under the Federal Consumer Credit Protection Act, a maximum of 75 percent of net weekly earnings, or 30 times the federal minimum wage per week, is exempt from garnishment. Above this amount, up to 25 percent of wages may be garnished. Thus, the fraction of wages that creditors may garnish rises as wages increase. 15 U.S.C. § 1673(a).

[37] We use Mathematica to solve the model. The programs used are available by request from the authors.

[38] This figure seems high, relative to the actual bankruptcy filing rate in the United States, which was 1.4 percent of households in 1997. But it is far below the proportion of U.S. households that would benefit financially from filing for bankruptcy. See White, *supra* note 7.

Panel A of Table 1 corresponds to the current bankruptcy system, with a zero bankruptcy tax rate on future earnings ($e = 1$) and a fixed bankruptcy exemption for wealth of $20,310. Reading across the table, the intensity of strategic behavior increases from none ($h = 0$) in column 1 to ''mild'' ($h = .1$), ''medium'' ($h = .2$), and ''strong'' ($h = .3$) in columns 2–4 of panel A, respectively. Columns 1–4 of panel B and columns 1–4 of panel C represent the bankruptcy reform with constant bankruptcy tax rates of 7 percent ($e = .93$) and 15 percent ($e = .85$), respectively. Reading down any column corresponds to increasing the bankruptcy tax rate while holding the intensity of strategic behavior and the wealth exemption level constant.

In column 2 of panel A the current bankruptcy system remains in effect, but consumers are allowed to choose between nonstrategic behavior and mild strategic behavior ($h = .1$). Although strategic behavior involves hiding only 10 percent of wealth, about 15 percent of consumers choose to behave strategically. The probability of filing for bankruptcy is denoted p_b and p_b^s for nonstrategic and strategic consumers, respectively. Consumers who behave strategically are 50 percent more likely to file for bankruptcy than consumers who do not: their probability of filing, p_b^s, is .141 compared to $p_b = .094$ for nonstrategic consumers. Because the overall default rate rises, the interest rate on loans also rises, from .084 in column 1 to .087 in column 2 (both columns of panel A). As a result, the amount borrowed falls from $58,353 in column 1 to $58,085 in column 2 of panel A. The introduction of strategic behavior makes nonstrategic consumers worse off, so that the social welfare level is lower in column 2 than in column 1 of panel A.

In column 2 of panel B (Table 1), consumers still choose between behaving nonstrategically and engaging in mild strategic behavior, but now we introduce the bankruptcy reform with a bankruptcy tax rate of 7 percent. (The wealth exemption in bankruptcy, E, remains at its base case value of $20,310.) Imposing the bankruptcy tax on earnings reduces the attractiveness of behaving strategically, since strategic consumers are more likely to pay the tax than nonstrategic consumers. As a result, the probability of strategic behavior falls from .15 in column 2 of panel A to .141 in column 2 of panel B. The bankruptcy tax also makes filing for bankruptcy less attractive for both types of consumers, so the probability of bankruptcy falls from .094 to .078 for nonstrategic consumers and from .141 to .118 for strategic consumers. Overall, the adoption of the bankruptcy reform raises the social welfare level from 9.1191 in column 2 of panel A to 9.11929 in column 2 of panel B.

Moving rightward in Table 1 corresponds to raising the intensity of strategic behavior, while moving downward corresponds to raising the bankruptcy tax rate. The simulation results confirm what we would intuitively

expect, that as opportunities for strategic behavior increase (h rises), consumers become more likely to behave strategically. Also as the intensity of strategic behavior increases, strategic consumers' probability of filing for bankruptcy rises quickly, while nonstrategic consumers' probability of filing for bankruptcy remains almost unaffected. For example, when the current bankruptcy system is in effect and strategic behavior is mild, column 2 of panel A shows that 15 percent of consumers behave strategically, and 14 percent of strategic consumers file for bankruptcy. When strategic behavior is medium or strong, .19 and .22, respectively, of consumers behave strategically, and .206 and .30, respectively, of strategic consumers file for bankruptcy. When the bankruptcy reform goes into effect, both of these figures fall.

The simulation results also confirm the intuition that adopting the bankruptcy reform reduces the probability that consumers behave strategically. For example, when strategic behavior is strong and the bankruptcy reform with a tax rate of 7 percent is adopted, the probability that consumers behave strategically falls from .22 in column 4 of panel A to .21 in column 4 of panel B, and the probability that strategic consumers file for bankruptcy falls sharply from .30 to .26. These effects are even stronger when the bankruptcy reform with a tax rate of 15 percent is adopted.

A result that is less intuitive is the effect of the bankruptcy reform on period 2 labor supply, N_2. Moving down any of the columns in Table 1 shows that as the bankruptcy tax rate on earnings rises, nonstrategic consumers work more, while strategic consumers work less. Adopting the bankruptcy reform has substitution, purchasing power (income), and risk effects, each of which differ for strategic versus nonstrategic consumers. The substitution effect results from the fact that increasing the bankruptcy tax rate reduces consumers' expected after-tax wage. This causes both types of consumers to reduce their labor supply, but the reduction is larger for strategic consumers because they are more likely to file for bankruptcy. The purchasing power (income) effect results from the fact that increasing the bankruptcy tax rate reduces consumers' expected net purchasing power, which causes them to supply more labor. However, the effect is smaller for strategic consumers than for nonstrategic consumers, since the former hide part of their wealth when they file for bankruptcy and, therefore, have higher expected net purchasing power. Finally, increases in the bankruptcy tax rate reduce consumers' net purchasing power when W_2 is low, so net purchasing power becomes more risky (as shown in the bottom panel of Figure 2). The increased risk causes consumers to work more in order to reduce the probability of having low purchasing power, but the effect is stronger for nonstrategic than strategic consumers. Overall, the results in Table 1 show that the positive effects on labor supply dominate for nonstra-

tegic consumers and the negative effects dominate for strategic consumers.[39]

Another counterintuitive effect is that imposing the bankruptcy tax causes consumers to borrow less even though the cost of borrowing falls. Recall that the size of the loan reflects nonstrategic consumers' preferences. While the reduction in the interest rate raises consumers' demand for loans, the imposition of the bankruptcy tax raises the uncertainty of nonstrategic consumers' purchasing power, because they must pay the tax when they file for bankruptcy. This increase in uncertainty lowers their demand for loans. Overall, the negative effect on loan demand predominates.

Now consider the effect of adopting the bankruptcy reform on the level of social welfare. In each column of Table 1, the bankruptcy regime that maximizes social welfare is indicated by boldface type. When there is no strategic behavior, there is no gain from adopting the bankruptcy reform, and the current bankruptcy system must be optimal. But whenever there is strategic behavior, the bankruptcy reform is preferred over the current bankruptcy system. Under mild strategic behavior, the optimal bankruptcy tax rate is 7 percent. Under medium strategic behavior, the optimal bankruptcy tax rate is 15 percent, and under strong strategic behavior, the optimal bankruptcy tax rate is a surprisingly high 55 percent.[40] Thus, the more intense is strategic behavior, the higher is the optimal bankruptcy tax rate. This is because as strategic behavior becomes more intense, nonstrategic consumers have a greater incentive to discourage it. But their only means of doing so is to raise the bankruptcy tax rate.

We can also measure the effectiveness of bankruptcy reform in discouraging strategic behavior by examining how many additional bankruptcy filings are caused by strategic behavior under the reform versus under the current bankruptcy system. The expected number of additional bankruptcy filings that results from strategic behavior is $[p_s p_b^s + (1 - p_s)p_b] - p_b$. When the current bankruptcy system is in effect, this figure is .0071, .0217, and .0466 for mild, medium, and strong strategic behavior, respectively. When the bankruptcy system is optimized for each level of strategic behavior, the figures are .0056, .0153, and .0112, respectively. Thus, adopting the optimal bankruptcy system reduces strategic bankruptcy filings by 20 percent when strategic behavior is mild, 29.5 percent when strategic behavior is medium, and 76 percent when strategic behavior is strong.

[39] But see the discussion of Table 2, where both types of consumers reduce their labor supply when the bankruptcy tax rate rises but the wealth exemption is adjusted at the same time.

[40] The results in this case (not shown in Table 1) are $p_s = .145$, $B = \$50{,}964$, $r = .057$, $N_2 = 6.217$, $N_2^s = 6.15$, $p_b = .017$, $p_b^s = .094$, and $SWF = 9.11489$.

B. The Bankruptcy Reform with the Optimal Wealth Exemption Level

Now turn to Table 2. Here we repeat the analysis of Table 1 except that, in each column, we solve for the optimal wealth exemption in bankruptcy, E^*. The wealth exemption in the base case, column 1 of panel A, is again $E^* = \$20{,}310$. When the wealth exemption is reoptimized for each combination of values of h and the bankruptcy tax rate, it rises as the bankruptcy tax rate increases, holding the intensity of strategic behavior constant (that is, moving downward in the table). This is because increasing the bankruptcy tax rate makes nonstrategic consumers worse off by raising the riskiness of their net period 2 purchasing power, but the increased risk can be offset by raising the wealth exemption level. When both the wealth exemption and the bankruptcy tax rate are allowed to vary simultaneously, increases in the tax rate and reductions in E^* have offsetting effects, so that the amount borrowed, the interest rate, the proportion of consumers that behaves strategically, and the probabilities of both groups filing for bankruptcy all remain virtually unchanged. For example, when strategic behavior is mild and the current bankruptcy system is in effect, nonstrategic consumers prefer a wealth exemption of \$18,850 (column 2 of panel A). This figure rises to \$20,890 when the bankruptcy tax rate is 7 percent (column 2 of panel B), and \$23,210 when the bankruptcy tax rate is 15 percent (column 2 of panel C). In all three cases, the proportion of consumers that behaves strategically is about .143, and the probabilities that nonstrategic and strategic consumers file for bankruptcy are .082 and .124, respectively. The amount borrowed and the interest rate remain constant at \$57,130 and .081, respectively.

Now suppose the intensity of strategic behavior increases, holding the bankruptcy tax rate constant (that is, a move to the right in Table 2). The increase in the intensity of strategic behavior makes nonstrategic consumers worse off, and, since the bankruptcy tax rate remains constant, it is efficient to discourage strategic behavior by reducing the wealth exemption level. For example, when the current bankruptcy system is in effect and strategic behavior intensifies from mild to medium, the optimal wealth exemption falls from \$18,850 in column 2 to \$15,440 in column 3 (both columns of panel A). In this case the proportion of consumers that behaves strategically rises from .143 to .170, or by 19 percent. If, instead, the wealth exemption level remained constant, then the results in Table 1 tell us that the proportion of consumers that behaves strategically would have risen from .15 to 192, or by 28 percent. The table illustrates that reductions in the wealth exemption level and increases in the bankruptcy tax rate are alternative means of discouraging strategic behavior. Since both changes make nonstrategic consumers worse off by increasing the riskiness of period 2 net

TABLE 2

SIMULATION RESULTS WITH VARIABLE E AND CONSTANT TAX RATE ON EARNINGS

A. CURRENT BANKRUPTCY SYSTEM WITH ZERO TAX RATE ($e = 1$)

	None (1)	Mild (2)	Medium (3)
h	0	.1	.2
p_s	0	.143	.170
E^* ($)	20,310	18,850	15,440
B ($)	58,353	57,132	54,908
r	.084	.081	.074
N_2, N_2^s	6.213, · · ·	6.214, 6.25	6.218, 6.224
p_b, p_b^s	.095, · · ·	.082, .124	.058, .143
$EU = SWF$	**9.120617**	9.119277	**9.11702**

B. BANKRUPTCY REFORM WITH 7% TAX RATE ($e = .93$)

	None (1)	Mild (2)	Medium (3)
h	0	.1	.2
p_s	0	.144	.170
E^* ($)	22,350	20,890	17,480
B ($)	58,356	57,131	54,902
r	.084	.081	.074
N_2, N_2^s	6.213, · · ·	6.213, 6.241	6.216, 6.215
p_b, p_b^s	.095, · · ·	.082, .124	.058, .142
$EU = SWF$	9.120616	9.119279	9.1170204

C. BANKRUPTCY REFORM WITH 15% TAX RATE ($e = .85$)

	None (1)	Mild (2)	Medium (3)
h	0	.1	.2
p_s	0	.143	.170
E^* ($)	24,670	23,210	19,810
B ($)	58,352	57,124	54,900
r	.084	.081	.074
N_2, N_2^s	6.213, · · ·	6.212, 6.23	6.215, 6.20
p_b, p_b^s	.095, · · ·	.082, .124	.058, .143
$EU = SWF$	9.120616	**9.1192802**	9.117018

NOTE.—"None," "mild," and "medium" describe the strategic behavior of consumers.

purchasing power, the optimal bankruptcy reform may involve raising the bankruptcy tax and offsetting the increased risk by simultaneously raising the wealth exemption level.

An interesting difference between the two versions of the bankruptcy reform is that in Table 2 adoption of the reform causes both types of consumers to reduce their labor supply, while in Table 1 nonstrategic consumers increase their labor supply. In Table 2, increases in the bankruptcy tax rate are accompanied by increases in the wealth exemption level E, which means that the riskiness of net purchasing power does not rise by as much as it did in Table 1, where E was constant. As a result, nonstrategic consumers' incentive to raise their labor supply in order to reduce the uncertainty of their expected net purchasing power is smaller, and, overall, they reduce rather than increase their labor supply.

How consumers who file for bankruptcy would change their work hours in response to the bankruptcy reform is an important policy issue, since the reform should not give consumers in bankruptcy an incentive to quit their jobs or reduce their work effect in a major way. A drawback of the model is that, in order to make it tractable, we assumed that consumers make their labor supply decisions in the first period—before they learn their period 2 wealth and decide whether to file for bankruptcy—rather than in the second period after they make their bankruptcy decisions. This means that the model's labor supply results indicate the amount that consumers would work in period 2, averaged over work hours when they file versus do not file for bankruptcy. However, the adoption of the bankruptcy reform affects labor supply only indirectly when consumers do not file for bankruptcy and are not subject to the bankruptcy tax, so the effect should be very small. Suppose we examine the effect of adopting the bankruptcy reform with a 7 percent tax rate on period 2 work hours of consumers that file for bankruptcy, assuming that strategic behavior is medium. Table 2 shows that adoption of the reform causes nonstrategic consumers' expected period 2 work hours to fall from 6.218 to 6.216 hours, or by .032 percent, and strategic consumers' expected period 2 work hours to fall from 6.224 to 6.215 hours, or by .14 percent. Assume that period 2 work hours remain constant when consumers do not file for bankruptcy. Then the predicted effect of adopting the reform is that nonstrategic consumers' period 2 work hours when they file for bankruptcy fall by .00032/.058 = .55 percent and strategic consumers' work hours when they file for bankruptcy fall by .0014/.143 = 1.0 percent. For the version of the reform in Table 1, the analogous results are that when they file for bankruptcy, nonstrategic consumers' work hours increase by 1.6 percent and strategic consumers' work hours fall by 1.2 percent. Thus, the results suggest that adoption of the reform would have only very small effects on work effort by consumers who file for bankruptcy. Since an im-

portant concern in adopting the bankruptcy reform is that it not cause consumers to greatly reduce their work effort, these results support the reform.[41]

Now consider the optimal bankruptcy system in the context of Table 2. Once again, when there is no strategic behavior, the best bankruptcy system is the current system with a bankruptcy tax rate of zero and a wealth exemption level of $20,310. When strategic behavior intensifies from none to mild, the optimal bankruptcy system shifts to the bankruptcy reform with a tax rate of 15 percent and an increase in the wealth exemption level from $20,310 to $23,210 (see column 2 of panel C). However, when strategic behavior intensifies from mild to medium, the preferred bankruptcy system does not involve raising the bankruptcy tax rate further. Instead, the best bankruptcy system has a bankruptcy tax rate of zero and a wealth exemption level of only $15,440. Thus, the results suggest that the optimal bankruptcy system involves a shifting trade-off between the bankruptcy tax rate and the wealth exemption level as the intensity of strategic behavior changes. When strategic behavior is mild, the best approach is to adopt the bankruptcy reform with a high tax rate but to offset the resulting increase in risk by raising the wealth exemption level. But as strategic behavior becomes more intense, the optimal bankruptcy system involves eliminating the bankruptcy tax completely and, instead, discouraging strategic behavior by reducing the wealth exemption level.

C. The Bankruptcy Reform with a Fixed Wealth Exemption Level and a Rising Bankruptcy Tax Rate

Now turn to Table 3, which gives results for the bankruptcy reform when the tax rate on postbankruptcy earnings rises, instead of remaining constant, as earnings increase. As in Table 1, the wealth exemption in bankruptcy, E, remains fixed at $20,310. Because the results under the current bankruptcy system (columns 1–4 of panel A in Table 1) remain the same, we omit these results from Table 3. The rising bankruptcy tax schedule shown in columns 1–4 of panel A in Table 3 imposes a 1 percent tax on the first dollar of earnings, rising to 7 percent on the marginal dollar of earnings. Consumers who are subject to this bankruptcy tax schedule repay less in total than those who are subject to the constant bankruptcy tax rate of 7 percent discussed in Table 1, but both face the same incentives at the margin. The rising tax rate schedule does not increase the riskiness of period 2

[41] The labor supply results are only slightly larger when the bankruptcy reform with a 15 percent tax rate is adopted and are even smaller when the versions of the bankruptcy reform discussed in Tables 3 and 4 are adopted.

TABLE 3

SIMULATION RESULTS WITH FIXED E AND RISING TAX RATE ON EARNINGS

A. BANKRUPTCY REFORM WITH MARGINAL TAX RATE OF 7%

	None (1)	Mild (2)	Medium (3)	Strong (4)
h	0	.1	.2	.3
p_s	0	.146	.188	.22
E ($)	20,310	20,310	20,310	20,310
B ($)	57,722	57,487	56,947	55,982
r	.081	.083	.089	.099
N_2, N_2^s	6.22, · · ·	6.21, 6.24	6.20, 6.21	6.19, 6.18
p_b, p_b^s	.0871, · · ·	.0865, .130	.0855, .193	.083, .282
$EU = SWF$	9.12058	9.119245	9.11614	9.11047

B. BANKRUPTCY REFORM WITH MARGINAL TAX RATE OF 15%

	None (1)	Mild (2)	Medium (3)	Strong (4)
h	0	.1	.2	.3
p_s	0	.143	.185	.217
E ($)	20,310	20,310	20,310	20,310
B ($)	57,312	57,096	56,600	56,695
r	.078	.081	.086	.096
N_2, N_2^s	6.22, · · ·	6.21, 6.23	6.21, 6.20	6.20, 6.16
p_b, p_b^s	.082, · · ·	.082, .124	.081, .184	.079, .271
$EU = SWF$	9.12052	9.1192826	9.11636	9.110958

C. BANKRUPTCY REFORM WITH MARGINAL TAX RATE OF 20%

	None (1)	Mild (2)	Medium (3)	Strong (4)
h	0	.1	.2	.3
p_s	0	.142	.184	.215
E ($)	20,310	20,310	20,310	20,310
B ($)	57,087	56,881	56,404	55,534
r	.077	.079	.085	.095
N_2, N_2^s	6.217, · · ·	6.213, 6.223	6.206, 6.193	6.197, 6.155
p_b, p_b^s	.079, · · ·	.079, .120	.078, .180	.076, .27
$EU = SWF$	9.12048*	**9.119289**	9.11647*	9.111210*

NOTE.—"None," "mild," "medium," and "strong" describe the strategic behavior of consumers.

* The current bankruptcy system is optimal when there is no strategic behavior. The optimal bankruptcy tax schedule has a marginal tax rate of 85% when strategic behavior is medium and 100% when strategic behavior is strong.

purchasing power as much as the analogous constant tax rate schedule, because taxation of inframarginal earnings is at lower rates. In columns 1–4 of panel B and 1–4 of panel C in Table 3, the tax rate schedules again are 1 percent on the first dollar of earnings, rising to 15 percent and 20 percent, respectively, on the marginal dollar of earnings. This means that the marginal tax rate in columns 1–4 of panel B in Table 3 is the same as that in columns 1–4 of panel C in Table 1.

Under the reform with the rising bankruptcy tax rate, the obligation to repay debt from earnings in bankruptcy is lower and, therefore, behaving strategically and filing for bankruptcy are both more attractive than in Table 1. As a result, the interest rate rises, but consumers increase their borrowing, nonetheless, because bankruptcy provides better insurance against the risk that period 2 net purchasing power turns out to be low. For example, when the marginal tax rate is 7 percent, and strategic behavior is medium, the proportion of consumers that behaves strategically is .188 in Table 3, column 3 of panel A, compared with .183 in Table 1, column 3 of panel B. The proportions of nonstrategic and strategic consumers who file for bankruptcy are .0855 and .193 in column 3 of panel A in Table 3, respectively, compared with .077 and .18 in column 3 of panel B in Table 1. Reduced risk also raises demand for loans. Consumers borrow $56,947 at an interest rate of .089 in Table 3, compared with $56,314 at an interest rate of .083 in Table 1.

Finally, consider the optimal bankruptcy system under the rising tax rate schedule. Again when there is no strategic behavior, the current bankruptcy system is preferred.[42] But when mild strategic behavior is introduced, the bankruptcy reform with a marginal tax rate of 20 percent on earnings is preferred. When strategic behavior intensifies to medium, the bankruptcy reform with a very high marginal tax rate of 85 percent is preferred.[43] From Table 1, the optimal constant bankruptcy tax rates are 7 percent and 15 percent when strategic behavior is mild and medium, respectively. Because the rising bankruptcy tax rate schedule is less effective in discouraging strategic behavior and bankruptcy than a constant bankruptcy tax rate, the optimal marginal tax rate is higher under the rising than the constant tax rate schedule.[44] In general, when the bankruptcy reform involves a rising rather than

[42] The social welfare level under the current bankruptcy system, which from Table 1 is 9.1206, exceeds any of the social welfare levels given in the left-hand column of Table 3.

[43] The optimal rising bankruptcy tax schedule when strategic behavior is medium is $(1 - e) = .01 \times \exp[.1531Y_2]$, which implies a marginal tax rate on earnings of 85 percent. In this case, $p_s = .167$, $B = \$54{,}547$, $r = .072$, $N_2 = 6.20$, $N_2^s = 6.11$, $p_b = .054$, $p_b^s = .1375$, and $SWF = 9.11694$.

[44] When strategic behavior is strong, the optimal rising bankruptcy tax rate schedule in Table 3 involves a marginal tax rate greater than 85 percent.

TABLE 4

SIMULATION RESULTS WITH VARIABLE E AND RISING TAX RATE ON EARNINGS

A. BANKRUPTCY REFORM WITH MARGINAL TAX RATE OF 7%

	None (1)	Mild (2)	Medium (3)
h	0	.1	.2
p_s	0	.144	.170
E^* ($)	22,210	19,750	16,350
B ($)	58,353	57,129	54,904
r	.084	.081	.074
N_2, N_2^s	6.213, · · ·	6.212, 6.24	6.216, 6.215
p_b, p_b^s	.095, · · ·	.082, .124	.058, .143
$EU = SWF$	9.1206170	9.1192796	9.1170199

B. BANKRUPTCY REFORM WITH MARGINAL TAX RATE OF 15%

	None (1)	Mild (2)	Medium (3)
h	0	.1	.2
p_s	0	.143	.170
E^* ($)	21,820	20,370	16,960
B ($)	58,350	57,131	54,900
r	.084	.081	.074
N_2, N_2^s	6.213, · · ·	6.212, 6.23	6.215, 6.20
p_b, p_b^s	.095, · · ·	.082, .124	.058, .143
$EU = SWF$	9.1206169*	**9.1192804**	9.117017*

NOTE.—"None," "mild," and "medium" describe the strategic behavior of consumers.

* When strategic behavior is medium, the optimal bankruptcy system is the current system with a zero tax rate on earnings.

constant tax rate on postbankruptcy earnings, the bankruptcy reform again dominates the current bankruptcy system whenever consumers behave strategically. The optimal tax rate on the marginal dollar of earnings is higher under the rising tax rate schedule than under the constant tax rate.

D. The Bankruptcy Reform with a Variable Wealth Exemption Level and a Rising Bankruptcy Tax Rate

The final set of simulations, shown in Table 4, repeats the analysis in Table 3, but here we solve for the optimal wealth exemption level E^* for each set of parameter values. Columns 1–3 of panel A and columns 1–3 of panel B in Table 4 correspond to rising tax rate schedules with marginal tax rates of 7 percent and 15 percent, respectively. Thus, columns 1–3 of

panel A and columns 1–3 of panel B in Table 4 correspond to columns 1–3 of panel B and columns 1–3 of panel C in Table 2, respectively. The analysis of the current bankruptcy system is the same in Table 4 as in columns 1–3 of panel A in Table 2, so the results are omitted from Table 4.

The results for the bankruptcy reform in Table 4 are similar to those in Table 2. As strategic behavior becomes more intense, holding the bankruptcy tax schedule constant, the optimal wealth exemption level E^* falls. But as the bankruptcy tax schedule shifts upward, holding the intensity of strategic behavior constant, the optimal wealth exemption E^* rises. However, because the riskiness of period 2 purchasing power is smaller under the rising tax rate schedule than under the constant tax rate schedule, the optimal wealth exemption E^* is always smaller in magnitude under the rising tax rate schedule. As an example, when the constant tax rate of 7 percent is in effect and strategic behavior is mild, column 2 of panel B in Table 2 shows that the optimal wealth exemption is $20,890. But when the rising tax rate schedule with a marginal tax rate of 7 percent is in effect and strategic behavior is mild, column 2 of panel A in Table 4 shows that the optimal wealth exemption falls to $19,750.

The optimal bankruptcy system in Table 4 has a shifting trade-off pattern similar to that in Table 2. When strategic behavior is mild, the optimal bankruptcy system is the bankruptcy reform with a marginal rate of 15 percent (column 2 of panel B in Table 4). But when strategic behavior intensifies from mild to medium, the optimal bankruptcy system shifts back to the current system with a zero tax rate on earnings. As strategic behavior intensifies from none to mild, nonstrategic consumers prefer to discourage strategic behavior by adopting a 15 percent bankruptcy tax while keeping the wealth exemption level approximately constant. But as strategic behavior intensifies further from mild to medium, nonstrategic consumers prefer to shift back to a zero bankruptcy tax on earnings combined with a much lower wealth exemption level.

V. Conclusion

An important function of a personal bankruptcy system is to provide partial wealth insurance to consumers. The bankruptcy system benefits risk-averse consumers by reducing the riskiness of their future purchasing power since, if wealth turns out to be low when debts come due, consumers can file for bankruptcy and some of their debts will be discharged. However, the current bankruptcy system gives consumers an incentive to behave strategically by filing for bankruptcy and obtaining discharge of debt even when their ability to repay is high. A large fraction of U.S. households have an incentive to take advantage of the bankruptcy system, which in part accounts for the rapidly rising bankruptcy filing rate.

Under our proposed bankruptcy reform, debtors filing for bankruptcy would be obliged to use part of both their wealth and their future earnings to repay debt, so the obligation to repay debt in bankruptcy would depend on ability to repay. This is in contrast to the current system, which obliges debtors to use only nonexempt wealth to repay debt, while future earnings are completely exempt. The obligation to use part of their future earnings to repay debt discourages debtors from taking advantage of the bankruptcy system, because by doing so they become more likely to pay the bankruptcy ''tax.''

We analyze two versions of the bankruptcy reform. In the first version, the wealth exemption in bankruptcy is optimized for the current bankruptcy system with no bankruptcy tax on future earnings and remains at the same level when the bankruptcy reform is adopted. (This is a reasonable assumption since, under current law, each individual state is allowed to set its own wealth exemption in bankruptcy.) The result in this case is that whenever there is strategic behavior, the bankruptcy reform is preferred over the current bankruptcy system. The more intense is strategic behavior, the higher is the optimal bankruptcy tax rate on future earnings. In the second version of the bankruptcy reform, both the wealth exemption in bankruptcy and the bankruptcy tax rate are allowed to vary. Since reducing the wealth exemption and imposing a bankruptcy tax on earnings both discourage strategic behavior, the optimal bankruptcy system could use either policy instrument. The results show that when there is ''mild'' strategic behavior, the optimal bankruptcy system involves adopting the bankruptcy reform with a bankruptcy tax on earnings but simultaneously raising the wealth exemption in bankruptcy as a means of reducing risk. However, when strategic behavior is more intense, the optimal bankruptcy system involves a reversal. The current bankruptcy system with no tax on future earnings is preferred, but the wealth exemption in bankruptcy is reduced in order to discourage strategic behavior. Finally, we consider a bankruptcy tax schedule in which the marginal tax rate on postbankruptcy earnings rises rather than remains constant as earnings rise. Under the rising bankruptcy tax schedule, the bankruptcy reform again dominates the current bankruptcy system, and the optimal tax rate on the marginal dollar of earnings is higher than under the constant tax rate schedule. Under all four versions of the reform, labor-supply effects are very small. Thus, adopting the reform would not cause either nonstrategic or strategic consumers to drastically reduce their work effort.

In general the results show that the proposed bankruptcy reform dominates the current bankruptcy system in a wide range of circumstances. The reform improves efficiency of the bankruptcy system, while still preserving its insurance function for those debtors whose ability to repay is truly low.