

**Personal Bankruptcy:
Insurance, Work Effort, Opportunism and the
Efficiency of the ‘Fresh Start’**

Michelle J. White
University of California, San Diego, and National Bureau of Economic Research

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I. Introduction¹

This paper has dual purposes. First it analyzes the objectives of personal bankruptcy law, using the same general framework that economists have used to analyze the objectives of corporate bankruptcy law. The intent of doing so is to draw out the parallels between the economics of personal versus corporate bankruptcy—two areas in which the literatures have developed in isolation from each other. I argue that a number of the objectives that are important in corporate bankruptcy do not apply in personal bankruptcy. In particular, the problems of distressed-but-efficient firms liquidating when they should reorganize or distressed, inefficient firms reorganizing when they should liquidate—i.e., “filtering failure”—do not apply in personal bankruptcy. In addition, the problem of managers preferring risky over safe projects, which is important in corporate bankruptcy, does not apply in personal bankruptcy since most consumers borrow to finance consumption rather than investment.

The second purpose of the paper is to develop a model of optimal personal bankruptcy exemptions that takes into account the two most important objectives of personal bankruptcy—encouraging efficient work effort by debtors before and after bankruptcy and providing debtors with consumption insurance. Previous models of personal bankruptcy have considered the insurance objective, but have not simultaneously considered both objectives. The model solves for the optimal bankruptcy exemption levels for earnings and wealth. A central focus of the model is to examine whether and when the “fresh start”—the policy of exempting 100% of post-bankruptcy earnings from the obligation to repay—is economically efficient. This issue is important for policy purposes, since the U.S. Senate recently passed a reform of bankruptcy law that would restrict the availability of the fresh start.

The results of the model suggest strong support for the efficiency of the fresh start policy. In particular, the fresh start is shown to be economically efficient except when debtors behave strongly opportunistically, meaning that debtors’ probability of filing for bankruptcy increases sharply when exemption levels rise. If opportunistic behavior is non-existent or weak, then the optimal policy is the fresh start combined with the highest

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wealth exemption that is consistent with loan markets operating. However if some or all debtors are strongly opportunistic, then the fresh start policy may become inefficient. The paper develops conditions under which the fresh start policy is economically efficient. It also examines how the optimal values of the earnings and wealth exemptions are related to each other and it discusses an example.

The paper is arranged as follows. Section II discusses the objectives of personal and corporate bankruptcy and how they relate to each other. Section III presents the formal model of personal bankruptcy and solves for the optimal exemption levels for wealth and post-bankruptcy earnings. It also discusses the conditions under which the fresh start is economically efficient. Section IV discusses the results of a simulation of optimal exemption policy. Section V is the conclusion.

II. Comparison of the Objectives of Personal versus Corporate Bankruptcy

How different are the economic objectives of personal versus corporate bankruptcy policy? Consider three economic objectives: (1) efficient investment decisions both before and after bankruptcy, (2) efficient work effort decisions by debtors both before and after bankruptcy, and (3) providing consumption insurance to debtors.² The first two both arise from the general objective of encouraging efficient use of resources. I argue below that the first applies mainly to corporate bankruptcy, while the second applies mainly to personal and small business bankruptcy. The third objective arises because debtors are risk averse and so it is efficient to protect them at least partially from uncertainty. This objective originally developed to protect entrepreneurs from the consequences of business losses and to keep them in business. But it now applies mainly to non-business debtors.

Consider objective (1), encouraging efficient investment decisions by managers and creditors before and after bankruptcy. This objective covers a number of different types of decisions, including managers' choice between safe versus risky investment projects, managers' choice of whether/when to file for bankruptcy or initiate a non-bankruptcy workout, managers' choice of whether to file for bankruptcy under Chapter 7 versus

² See Jackson (1986), Rasmussen (1992), and White (1996) and (1998) for general discussion of the objectives of corporate bankruptcy.

Chapter 11, and creditors' choice of whether/when to shut the firm down by foreclosing on essential assets. Each of these decisions and their efficiency costs has been explored in separate strands of the bankruptcy and corporate governance literatures. Jensen and Meckling (1978) and Stiglitz (1972) were the first to explore the effect of limited liability and bankruptcy on managers' choice between risky versus safe investment projects. Limited liability gives managers an incentive to choose risky projects even when safe projects may have higher expected value. This is because managers and equity benefit when these projects have high returns, but creditors bear some of the losses when risky projects result in low returns. In contrast, safe projects are less attractive to managers because creditors are always repaid in full. But while creditors would like to prevent managers from choosing risky investments, they may not be able to do so.³ Another strand of this literature examines managers' choice of whether to initiate a "workout" by threatening to file for bankruptcy if creditors do not agree to accept lower repayment than they were promised under the original terms of their loans. Firms that initiate workouts may be either solvent or insolvent, but creditors cannot identify individual firms' types. Because of this, managers sometimes have an incentive to initiate workouts even though their firms are solvent. As a result, creditors sometimes reject managers' workout demands in order to discourage managers of solvent firms from initiating workouts. In the models, workouts are always preferred to bankruptcy because transactions costs are lower in workouts. But in equilibrium, some firms—both solvent and insolvent—end up in bankruptcy. See Gertner and Scharfstein (1991) and Povel (1999) for discussion.

A third type of inefficiency occurs because failing firms can take either of two paths in bankruptcy: continuing to operate or shutting down. Shutting down is more efficient if failing firms' assets have alternate uses in which they are more valuable, since liquidation frees the assets to move to the higher value uses. But continuing to operate is more efficient if failing firms' assets are most valuable in their current use. The best outcome is for all firms in the former group to liquidate in bankruptcy by filing under Chapter 7 and for all firms in the latter group file for reorganize in bankruptcy by filing under Chapter 11. "Filtering failure" occurs when firms in either group follow the wrong

³ See Bebchuk (2002) for a model that explores how different priority rules in bankruptcy affect managers' incentives to favor risky over safe investment projects.

path. White (1994) explores a model there is filtering failure because some inefficient, failing firms end up reorganizing in bankruptcy. This occurs because, in the U.S., managers are allowed to make the initial choice of Chapter and because, once in Chapter 11, the law gives them substantial bargaining power vis-à-vis creditors. Webb (1991) explores a model in which the opposite type of filtering failure occurs, since some distressed firms liquidate even though their assets are most valuable in their current use. This occurs because creditors have an incentive to race to be first to collect from financially distressed firms and the creditor that wins the race can satisfy its debt by liquidating some of the firm's assets. In the U.S. and most other countries, the race by creditors can be stopped by managers filing for bankruptcy. But in the U.K., managers are not allowed to file for bankruptcy if a particular type of creditor liquidates assets and forces the firm to shut down.⁴

Since objective (1) is so important for corporate firms, why isn't it equally important for consumer and small business debtors? One reason is that consumers typically borrow to finance consumption rather than investment, so that the question of whether they make economically efficient investments is unimportant. Another reason why objective (1) is unimportant for consumers is that "filtering failure" cannot occur in personal bankruptcy. This is because, for consumers, liquidation is never efficient and no liquidation ever occurs in personal bankruptcy. Individual debtors' most valuable asset is nearly always generally their human capital. Human capital can only be liquidated by selling debtors into slavery--as the Roman did--or by confining them in debtors' prisons until someone else pays their debts--as the British did in Charles Dickens' time.⁵ Both slavery and prison are economically inefficient because they result in large reductions in the value of human capital, since debtors cannot work in prison and would not work very effectively in slavery. Neither is used any longer, so that all personal bankruptcy procedures are forms of reorganization. In personal bankruptcy, debtors continue to own their human capital and have the right to use it and they also keep part or all of their non-human wealth. Some of their debts are discharged. Thus if we think of individual debtors each

⁴ See White (1996) for a comparison of bankruptcy law in the U.S. and U.K.

⁵ See Baird (1987) for discussion of the history of bankruptcy law. Baird notes that the original justification for bankruptcy exemptions was to give owners of failed businesses an incentive not to hide their assets from creditors.

as a business that owns a machine (the debtor's human capital), the debtor continues to own and operate the business/use the machine in bankruptcy and this is the most efficient outcome. Despite this, the two personal bankruptcy procedures under U.S. law--Chapter 7 and Chapter 13-- are called liquidation and reorganization procedures, respectively. But in fact both are reorganization procedures and they differ mainly in whether debtors are obliged to use part of their wealth or part of their future earnings to repay debt.⁶

However objective (1) also may apply to small businesses and consumers. Consumers who own businesses have similar incentives as corporate managers to choose risky over safe investments, delay bankruptcy, and falsely claim to be in financial distress. In addition, bankruptcy law affects consumers' spending patterns by giving them an incentive to substitute vacations and restaurant meals for investment in durables such as cars, furniture or houses. This is because debt incurred to purchase vacations is discharged in bankruptcy, while debt incurred to purchase durables is usually secured and is not discharged in bankruptcy.

Now turn to objective (2)—that of encouraging efficient work effort decisions by debtors before and after bankruptcy. This objective mainly applies to individual and small business debtors, since individual debtors' work effort has a major impact on whether they repay their debt, but corporate managers' work effort has little impact on whether the corporation repays or not. Two different types of work effort by individual debtors are considered under objective (2)—debtors' choice of work hours before and after filing for bankruptcy and their decision whether to file for bankruptcy. I refer to changes in either debtors' work hours or their probability of filing for bankruptcy in response to changes in bankruptcy rules as opportunism. Opportunistic behavior by debtors reduces economic efficiency because it causes interest rates to rise and makes credit more scarce.

The U.S. Supreme Court recognized objective (2) in a roundabout way in its 1937 opinion justifying the "fresh start" in bankruptcy—the 100% exemption for individual debtors' post-bankruptcy earnings from the obligation to repay. The Court's argument in

⁶ Note that when corporations reorganize under Chapter 11, they are normally obliged to use part of their post-bankruptcy earnings and some of their pre-bankruptcy assets to repay debt. They use assets to repay debt if, say, a division of the firm is liquidated as part of the reorganization and the proceeds of liquidation go to creditors.

favor of the fresh start was that, “from the viewpoint of the wage earner, there is little difference between not earning at all and earning wholly for a creditor.”⁷ However the Court seems to have considered only the two extreme possibilities that post-bankruptcy wages would either be 100% exempt or 0% exempt from the obligation to repay, while ignoring the possibility that wages could be shared between creditors and the debtor. The Court also ignored the economic costs of the fresh start. In the model discussed below, I examine whether abolishing the fresh start and requiring that debtors use part of their post-bankruptcy earnings to repay debt would increase economic efficiency.⁸

Objective (2) is less important for corporations, since corporate managers’ level of work effort probably has little effect on whether their firms default or not. However opportunistic behavior is clearly an issue both for corporate managers and individual debtors and it is also relevant for owners of small business. Although I assume that opportunism by corporate managers leads to inefficient investment decisions while opportunism by individual debtors leads to inefficient bankruptcy decisions or too little work effort, this distinction is admittedly somewhat artificial.⁹

Finally, turn to objective (3)—the insurance objective. Although economists generally do not associate the insurance objective with corporations, discharge of debt originally developed for businesses in financial distress. When merchant ships sank, merchants’ debts were discharged, presumably to make it more likely that they would remain in business despite their losses. At a time when the capital and skills required to be a merchant were scarce, this made sense. Although discharge of debt encourages opportunism, merchants who might have been tempted to falsely claim losses were deterred by the fact that the penalty for defrauding creditors was death and this penalty

⁷ *Local Loan Co. v. Hunt*, 202 U.S. 234 (1934).

⁸ Other countries do not generally apply the fresh start in bankruptcy and they treat debtors much more harshly. For example, in Germany, individual debtors are not allowed to file for bankruptcy voluntarily and their debts are not discharged in bankruptcy, although creditors’ efforts to collect are stayed. Debtors are required to repay from future earnings. Other European countries are similar. See Alexopoulos and Domowitz (1998) for discussion. Buckley (1994) compares the Canadian approach to bankruptcy, which does not mandate a fresh start for consumers, to the U.S. approach. He argues that the Canadian approach is preferable, mainly because it reduces the number of bankruptcy filings. Note that, even in the U.S., not all debt is discharged in bankruptcy, so that in practice debtors receive only a partial fresh start. For arguments for and against the fresh start, see Jackson (1986) and Posner (1995). Buckley (1994) also discusses public choice explanations for the fresh start.

⁹ See Bebchuk and Fried (2005) for discussion of how U.S. corporate law allows corporate managers to engage in extreme opportunistic behavior.

was occasionally carried out. Over time, discharge gradually expanded from covering only business debt to covering consumer debt. It also gradually lost its importance for owners of large businesses as the corporate form and limited liability developed. This is because shareholders of corporate firms are insured against their firms' losses by limited liability and because they can limit their exposure to any single firm's losses through diversification.¹⁰

However the insurance objective is extremely important for individual debtors and is also relevant for small businesses, particularly those that are non-corporate.¹¹ When illness, job loss, or failure of a small business reduces debtors' earnings or wealth, their obligation to repay debt may reduce their consumption to very low levels. But very low consumption levels can be costly even if they are temporary, because debtors may lose their homes, develop permanent health problems because they cannot afford medical care to treat their illnesses, their children may drop out of school and not go back, etc. Sharp reductions in consumption by a large number of households may also cause or contribute to an economy-wide recession. Debtors can partially insure themselves against adverse consumption shocks by limiting their borrowing, increasing their pre-bankruptcy work effort, diversifying their financial wealth, and by working for others rather than becoming entrepreneurs. But they cannot diversify their human capital, which for most debtors constitutes most of their wealth. Personal bankruptcy provides partial consumption insurance to debtors by discharging some debts when adverse shocks occur and by exempting debtors' human capital and some of their financial capital from the obligation to repay. This increases debtors' consumption in bad states by freeing up funds that would otherwise be used for debt repayment. Assuming that debtors are risk averse, they benefit from the consumption insurance that bankruptcy provides.

Finally, the insurance objective (3) is also important for small business. Individuals who are risk averse are more likely to start/own their own businesses if there is a personal bankruptcy procedure that reduces the cost to them of business failure by discharging

¹⁰ See Baird (1987) for historical discussion.

¹¹ Rea (1984) was the first to point the insurance aspect of personal bankruptcy. Jackson (1986) argued that post-bankruptcy wages should be more fully exempt than financial wealth in personal bankruptcy, because of debtors' inability to diversify their human capital.

their business debt and allowing them to keep some of their wealth. (See Fan and White, 2003, for discussion.)

III. A Model of Optimal Personal Bankruptcy Policy and the Fresh Start

In this section, I develop a model of optimal personal bankruptcy policy that considers the two objectives of encouraging efficient work effort and providing consumption insurance to debtors.

How does the model related to current U.S. personal bankruptcy law? Under current U.S. law, there are two personal bankruptcy procedures, Chapters 7 and 13. Debtors' unsecured debt is discharged if they file under either Chapter, but their obligation to repay differs. Under Chapter 7, debtors are obliged to use some of their wealth to repay, but their future earnings are completely exempt, i.e., the fresh start applies. Under Chapter 13, debtors propose a plan to use some of their post-bankruptcy earnings to repay debt, but their wealth is completely exempt. The plan goes into effect as long as the judge approves it. Because debtors have the right to choose between the two Chapters, they choose the procedure that is best for them. (See White, 1996b, for details of the two procedures). However in the model analyzed here, the two Chapters are combined into a single personal bankruptcy procedure. Debtors are obliged to use some of both their wealth and their post-bankruptcy earnings to repay, subject to separate exemptions for each. I solve for the wealth and earnings exemptions that maximize economic efficiency.¹² Combining the two Chapters has the advantage that it aligns debtors' obligation to repay in bankruptcy more closely to their ability to repay, since ability to repay depends on both wealth and future earnings. This assumption allows me to examine how the two exemptions related to each other and under what conditions the fresh start is economically efficient.

The model assumes that debtors do not have access to any form of consumption insurance other than the personal bankruptcy procedure, i.e., there are no income taxes,

¹² The model extends Wang and White (2000), Fan and White (2003), and Adler, Polak, and Schwartz (2000). The Adler et al paper also discusses the possibility of reforming other provisions of personal bankruptcy law besides the exemption levels, such as whether consumers should be allowed to reaffirm certain debts in bankruptcy.

unemployment compensation, welfare programs or privately-provided insurance policies that smooth consumption.¹³

Time sequence. The model has two periods. In period 1, a representative consumer has wealth w , which is known with certainty. Assuming that lenders are willing to lend, the consumer borrows a fixed amount B at interest rate r , to be repaid in period 2. The loan can be used for either consumption or investment. Assume that the loan is unsecured and that it is the debtor's only loan.¹⁴ Work hours in period 1 are denoted n . I initially assume that period 1 work hours are fixed, but later allow them to vary.

In period 2, the sequence of events is as follows. At the beginning of period 2, the consumer learns her period 2 draw from the wealth distribution. The consumer's period 2 wealth, denoted W , is distributed according to the density function $f(W)$ with support from $-\infty$ to ∞ . After learning her wealth, the consumer decides whether to file for bankruptcy. In bankruptcy, the debt of $B(1+r)$ is discharged, but the debtor must use some of both non-exempt wealth and non-exempt earnings to repay. Finally, she decides on her period 2 labor supply knowing whether she files for bankruptcy or not. In bankruptcy, her period 2 labor supply is denoted N_b ; while outside of bankruptcy, her period 2 labor supply is denoted N_n . Both N_b and N_n are assumed to be variable and in general they differ from each other. The model therefore captures the Supreme Court's concern that debtors work less or not at all if they are required to pay some or all of their post-bankruptcy earnings to creditors. The wage rate per hour is assumed to be one both in periods 1 and 2.

Bankruptcy exemptions. The wealth exemption, denoted X , can take any non-negative dollar value.¹⁵ The post-bankruptcy earnings exemption is assumed to be a

¹³ See Posner (1995) and Jackson (1986) for discussion of the relationship between bankruptcy and government safety net programs and Rea (1984) for discussion of privately-provided consumption insurance and why it does not exist. I also assume that creditors do not garnish debtors' wages outside of bankruptcy and that debtors never default on their debt without filing for bankruptcy. For discussion of the relationship between garnishment, default, and bankruptcy, see White (1998).

¹⁴ Because the debtor has only one loan, I do not consider the effect of priority rules in bankruptcy.

¹⁵ Most states have several exemptions for different forms of wealth. X is assumed to them.

fixed fraction m , where $0 < m \leq 1$.¹⁶ The cost of filing for bankruptcy is a fixed dollar amount, S , that includes lawyers' fees and filing fees. The consumer is assumed to pay S before filing, which means that the cost is sometimes borne by lenders.¹⁷

Consider the relationship between discharge of debt in bankruptcy and the two exemption levels. Given the absence of non-financial penalties for bankruptcy, i.e., slavery, imprisonment, physical pain, or social stigma, the exemption levels plus the filing fee can be interpreted as the price to debtors of having their debt discharged in bankruptcy. The most favorable bankruptcy policy for debtors is $m = 1$ and $X = \infty$, which corresponds to the fresh start in bankruptcy combined with an unlimited wealth exemption. In this case, the price of discharge is S .¹⁸ Conversely the harshest bankruptcy policy for debtors is $m = 0$ and $X = 0$, which means that debtors must use all of their wealth and future earnings to repay debt. Here the price of discharge is $\min[B(1+r), \max[W - S, 0] + N_b] + S$. The harshest bankruptcy policy currently allowed under the U.S. Bankruptcy code is $m = 1$ and $X = 0$, so that the price of discharge is $\min[B(1+r), \max[W - S, 0]] + S$. Note that a harsh bankruptcy policy is equivalent to abolishing bankruptcy.

The representative consumer's utility function is assumed to depend positively on consumption and negatively on labor supply in each period. Consumers are risk averse, so that the marginal utility of consumption declines as consumption increases. Consumption in period 1 is $w + B + n$ and labor supply in period 1 is n , so that utility in period 1 is $U(w + B + n, n)$. If the consumer does not file for bankruptcy, her period 2 utility is $U(W - B(1+r) + N_n, N_n)$. If she files for bankruptcy, then her period 2 utility

¹⁶ The earnings exemption is assumed to be uniform for all debtors. This differs from the current Chapter 13 procedure, under which individual debtors propose what fraction of debt they will repay and the fraction can vary from 1% to 100%. The earnings exemption is assumed to be a percent of earnings rather than a fixed dollar amount, since a fixed dollar earnings exemption would have perverse incentive effects for debtors with earnings near the threshold. Another reason for assuming a fixed percent wage exemption is that wage garnishment exemptions outside of bankruptcy take this form. The Federal Consumer Credit Protection Act mandates that 75% of wages must be exempt from wage garnishment. See White (1998a) for discussion.

¹⁷ This implies that lenders bear the cost of filing when debtors' wealth exceeds X , but debtors bear it when their wealth is below X .

¹⁸ About 7 U.S. states have unlimited exemptions for equity in homesteads (owner-occupied homes). (See Li and White, 2001.) To the extent that debtors can easily shift assets between categories, having an unlimited homestead exemption is equivalent to having an infinite wealth exemption.

is $U(\min[W - S, X] + mN_b, N_b)$. In the neighborhood where the consumer files for bankruptcy but is nearly indifferent between filing versus not filing, $\min[W - S, X] = X$. Labor supply in bankruptcy, N_b , is assumed to depend on the two exemption levels and labor supply outside of bankruptcy is assumed to be at least as great as in bankruptcy, $N_n \geq N_b$.

Debtors' bankruptcy decision in period 2. The debtor is assumed to file for bankruptcy whenever doing so increases her utility. Note that this is a fairly extreme assumption, since in practice many debtors do not file for bankruptcy even though they would benefit financially from doing so.¹⁹

Suppose \hat{W} denotes the threshold wealth level at which the debtor is indifferent between filing versus not filing for bankruptcy. The debtor is indifferent if:

$$U(\hat{W} - B(1+r) + N_n, N_n) = U(X + mN_b, N_b) \quad (1)$$

The consumer files for bankruptcy if $W \leq \hat{W}$ and avoids bankruptcy otherwise.

Figure 1 shows period 2 consumption, denoted C , as a function of period 2 wealth, W . To simplify the diagram, N_b and N_n are both assumed to be constants, but $N_n > N_b$. There are three consumption regions: region 3 where $W > \hat{W}$, the debtor does not file for bankruptcy and repays in full; region 2 where $X \leq W \leq \hat{W}$, the debtor files for bankruptcy and repays from both wealth and post-bankruptcy earnings; and region 1 where $W < X$, the debtor files for bankruptcy and repays only from earnings since her wealth is completely exempt. The border between regions 2 and 3 occurs where $W = \hat{W}$ and the border between regions 1 and 2 occurs where $W = X + S$. Consumption is rising in regions 1 and 3 and flat in region 2, but it jumps discontinuously upward at \hat{W} . This is because labor supply increases discontinuously when consumers do not file

¹⁹ White (1998b) estimates that at least 17% of U.S. households would benefit from filing for bankruptcy, while the actual filing rate is about 1.5% per year. However debtors are not allowed to file for Chapter 7 bankruptcy more than once every six years and this means that some debtors who would gain from filing for bankruptcy immediately have an incentive to delay, since their gain from filing may be greater in the future. In an empirical estimation of the bankruptcy filing decision, Fay, Hurst and White (2002) find that the probability of filing for bankruptcy is positively and significantly related to consumers' financial benefit from filing, but financial benefit is not the only important explanatory factor.

for bankruptcy, since they keep 100% rather than m percent of their period 2 earnings. Because additional work lowers utility, consumption must increase discontinuously in order to satisfy eq. (1). (If the fresh start applies in bankruptcy, then there is no discontinuity in work hours or consumption at \hat{W} .)

If we differentiate eq. (1) with respect to m and X separately and solve, we get:

$$\frac{d\hat{W}}{dX} = \frac{U'_{b2}}{U'_n} + B \frac{dr}{dX} \quad \text{and} \quad \frac{d\hat{W}}{dm} = \frac{U'_{b2}}{U'_n} N_b + B \frac{dr}{dm}$$

where U'_{b2} and U'_n represent the marginal utilities of consumption on the bankruptcy and no bankruptcy sides of \hat{W} , respectively. If we assume that dr/dX and dr/dm are both positive (see below for discussion), then these expressions imply that the threshold wealth level for filing for bankruptcy \hat{W} is positively related to both exemption levels. Also, debtors' probability of filing for bankruptcy, denoted $F(\hat{W})$, is positively related to both exemption levels. The positive relationship between the probability of filing for bankruptcy and the exemption levels represents opportunistic behavior by debtors, since they file for bankruptcy more often when doing so is more favorable.

While both of the bankruptcy exemptions provide consumption insurance to debtors, there is an important difference between them. Raising the wealth exemption X transfers wealth from region 3 to region 2 of figure 1, or from the highest to the middle consumption region. But raising the earnings exemption m transfers wealth from region 3 to regions 1 and 2 of figure 1, or from the highest to both the middle and lowest consumption regions. This difference between the two exemptions suggests that the insurance provided by the earnings exemption is more valuable, because only a higher earnings exemption raises consumption in the region where it is lowest. This suggests a new justification for the "fresh start."

The loan market. Assume that there are many consumers, all of whom are identical as of period 1. They all apply to borrow and lenders, who are risk neutral, are willing to lend as long as long as they expect to make zero profit. Thus lenders either lend to all consumers or to none. The zero profit condition is:

$$B(1+r) = \int_{-\infty}^{X+S} [(1-m)N_b]fdW + \int_{X+S}^{\hat{W}} [W - X - S + (1-m)N_b]fdW + \int_{\hat{W}}^{\infty} B(1+r)fdW \quad (2)$$

Here lenders' opportunity cost of funds is r per dollar. The three terms on the right hand side of (2) are expected repayment in regions 1, 2 and 3 of figure 1, respectively. In region 1, debtors are in bankruptcy and repay only from earnings; while in region 2 they are in bankruptcy but repay from both earnings and wealth. In region 3, they avoid bankruptcy and repay in full. Eq. (2) determines the market-clearing interest rate, r , as a function of the two exemptions.

Eq. (2) may not be satisfied at sufficiently high exemption levels, so that lending markets may break down.²⁰ Suppose the wealth exemption X rises, so that debtors repay less in bankruptcy. Lenders offset the loss by raising the interest rate, which allows them to collect more from debtors who avoid bankruptcy. But if X is already high, then debtors' probability of avoiding bankruptcy is low, so that an increase in the interest rate raises little additional revenue. If even a large interest rate increase does not generate enough additional revenue to offset lenders' losses, then they cease lending.

As an example, suppose $f(W)$ is distributed normally with mean 2 and standard deviation .25 and suppose $m = 1, B = 1, S = 0$, and $r = 0.1$. Also suppose $N_b = 1 - .1m$. Then eq. (2) is satisfied and loan markets operate as long as the wealth exemption X is no higher than .9 (90% of the loan amount). But loan markets fail if $X > .9$. Now suppose everything remains the same except that the earnings exemption m is .4 rather than 1. Then loan markets can operate with a wealth exemption X as high as .95.

To determine how the interest rate varies as the two exemptions change, partially differentiate eq. (2) with respect to m and X , taking account of changes in debtors' behavior. The results are, respectively:

$$B \frac{dr}{dm} [1 - F(\hat{W})] = \int_{-\infty}^{\hat{W}} N_b f dW - (1-m) \int_{-\infty}^{\hat{W}} \frac{dN_b}{dm} f dW - [\hat{W} - X - S + (1-m)N_b - B(1+r)] f(\hat{W}) \frac{d\hat{W}}{dm} \quad (3)$$

²⁰ If borrowers varied along some credit-relevant dimension that lenders could observe in period 1, then lenders might refuse to lend to less credit-worthy consumers, while still lending to more credit-worthy consumers. See Longhofer (1997) for a model.

$$B \frac{dr}{dX} [1 - F(\hat{W})] = \int_{X+S}^{\hat{W}} f dW - (1-m) \int_{-\infty}^{\hat{W}} \frac{dN_b}{dX} f dW - [\hat{W} - X - S + (1-m)N_b - B(1+r)] f(\hat{W}) \frac{d\hat{W}}{dX} \quad (4)$$

In both (3) and (4), the first term in the right hand side is the direct effect of the exemption change, or the change in the amount repaid assuming that work hours and the probability of filing for bankruptcy remain the same. Raising the wage exemption reduces repayment by the amount of post-bankruptcy earnings (N_b) times the probability of bankruptcy; while raising the wealth exemption by one dollar reduces repayment by one dollar times the probability of being in the higher-wealth bankruptcy region (region 2 of figure 1). The remaining terms in both equations are behavioral response terms that capture changes in the amount repaid because debtors change their work effort and/or their probability of filing for bankruptcy when the exemption levels change.

Equations (3) and (4) can be rewritten as:

$$B \frac{dr}{dm} [1 - F(\hat{W})] = \bar{N}_b F(\hat{W}) - WE_m - PB_m \quad (3')$$

$$B \frac{dr}{dX} [1 - F(\hat{W})] = F(\hat{W}) - F(X+S) - WE_X - PB_X \quad (4')$$

Here \bar{N}_b denotes average earnings in bankruptcy and $F(\hat{W})$ is the cumulative probability of filing for bankruptcy. WE_m and WE_X are the work effort response terms in equations (3) and (4), respectively, and PB_m and PB_X are the bankruptcy probability response terms in (3) and (4).

Examine the work effort response terms first. They give the change in the amount that debtors repay as a result of changing their work effort in bankruptcy when the exemption levels change. Assuming that dN_b / dm in (3) is positive and dN_b / dX in (4) is negative (work effort in bankruptcy rises when debtors keep a larger fraction of their earnings and falls when debtors keep more wealth), then WE_m is positive and WE_X is negative.²¹

²¹ The assumption that dN_b / dm is positive requires that the substitution effect of an increase in m exceeds the income effect. There is little research on the labor supply effects of increased wealth. We

Now consider PB_m and PB_X , the bankruptcy probability response terms in (3) and (4). The term in square brackets in both, $[\hat{W} - X - S + (1 - m)N_b - B(1 + r)]$, is the reduction in the amount that debtors repay when they file for bankruptcy, evaluated at \hat{W} where debtors are indifferent between filing versus not filing. This expression must be negative. $f(\hat{W})d\hat{W} / dm$ and $f(\hat{W})d\hat{W} / dX$ in (3) and (4) are the changes in debtors' probability of filing for bankruptcy when the exemption levels change, which must be positive. Thus PB_m and PB_X are the reduction in expected repayment that occurs when higher exemption levels cause more debtors to file for bankruptcy.

How do the behavioral response terms affect the signs of dr / dm and dr / dX ? Examining eq. (3'), if both WE_m and PB_m are zero, then dr / dm must be positive, i.e., interest rates must rise when the earnings exemption rises. Now suppose WE_m is non-zero. Because WE_m is preceded by a minus sign in (3'), this change makes dr / dm less positive, i.e., a given increase in m is associated with a smaller increase in the interest rate. This is because debtors repay more in bankruptcy when m increases, since they increase their work effort. Now suppose PB_m also becomes non-zero. This change makes dr / dm more positive, because debtors respond to an increase in m by filing for bankruptcy more often and repaying less. As a result, lenders offset the change by raising the interest rate by more. Now turn to WE_X and PB_X in (4'). Since both terms are negative, both cause dr / dX in eq. (4') to become larger/more positive.

How economically important are the behavioral response terms in (3') and (4')? WE_m and WE_X both approach zero as m approaches 100%, so that they decline in importance as m increases. Now consider how PB_m and PB_X change as the exemption levels increases. As m increases, N_n and N_b approach each other and $[\hat{W} - X - S + (1 - m)N_b - B(1 + r)]$ approaches $[-S]$. Therefore at $m = 1$, $PB_m = [-S]f(\hat{W})d\hat{W} / dm$ and $PB_X = [-S]f(\hat{W})d\hat{W} / dX$. Here S is the fixed cost of filing

would generally expect wealthier people to work less, but Fan and White (2003) found that individuals are more likely to own businesses if they have higher wealth, suggesting that dN_b / dX could be positive.

for bankruptcy, which is the reduction in the amount that lenders receive if debtors file for bankruptcy but do not change their labor supply.²²

The model assumes that debtors file for bankruptcy whenever they benefit financially from doing so, even if the financial benefit is very small. But in practice, many debtors do not file (or do not file immediately) for bankruptcy, even if they would benefit financially from doing so. White (1998b) estimated that at least 17% of U.S. household would benefit financially from filing, while the filing rate over the past 10 years has been 1% to 1.5% per year. If we multiply the yearly filing rate by 6 to take account of the fact that households cannot file under Chapter 7 more often than once every 6 years, then the actual filing rate becomes 6 – 9%. This suggests that, at most, only about half of all households that would benefit financially from filing actually file for bankruptcy. This suggests that $EB2X$ and possibly $EB2m$ may be smaller in practice than in the model.

The social welfare function. Since all consumers are identical ex ante, the social welfare function is the same as the representative consumer’s expected utility function, or:

$$\begin{aligned}
 & U(w + B + n, n) + \int_{-\infty}^{X+S} U(W - S + mN_b, N_b) f dW \\
 & + \int_{X+S}^{\hat{W}} U(X + mN_b, N_b) f dW + \int_{\hat{W}}^{\infty} U(W - B(1+r) + N_n, N_n) f dW \quad (5)
 \end{aligned}$$

We wish to determine the economically efficient values of the two exemption levels m and X , taking account of the fact that consumers maximize their private utility functions in deciding on their labor supply levels and whether to file for bankruptcy. To

²² As the wealth exemption gets larger, dr/dX eventually must approach infinity as loan markets break down.

do so, differentiate (5) separately with respect to m and X , using the envelope theorem,²³ and substitute eq. (3) or (4), respectively. The first order conditions for m and X are:

$$\bar{N}_b F(\hat{W}) \left[\bar{U}'_b - \bar{U}'_n + \frac{\text{cov}(U'_b, N_b)}{\bar{N}_b} \right] + \bar{U}'_n [WE_m + PB_m] \quad (6)$$

$$(F(\hat{W}) - F(X + S)) \left[\bar{U}'_{b2} - \bar{U}'_n \right] + \bar{U}'_n [WE_X + PB_X] \quad (7)$$

Here \bar{U}'_n is the average marginal utility of consumption outside of bankruptcy and outside of bankruptcy, respectively and \bar{U}'_b and \bar{U}'_{b2} are the average marginal utility of consumption in bankruptcy (regions 1 and 2 of figure 1) and in the higher-wealth bankruptcy region (region 2 of figure 1). $\text{cov}(U'_b, N_b)$ denotes the covariance of the marginal utility of consumption and labor supply in bankruptcy.

In order to determine the optimal earnings and wealth exemptions, we need to consider whether (6) and (7) have interior or corner solutions. Consider expression (6) first and suppose initially that $WE_m = PB_m = 0$. Then the sign of (6) becomes the sign of $[\bar{U}'_b - \bar{U}'_n + \text{cov}(U'_b, N_b) / \bar{N}_b]$. $\bar{U}'_b - \bar{U}'_n$ captures the gain to risk-averse consumers from bankruptcy-provided wealth insurance. It must be positive, since higher wealth is associated with lower marginal utility of consumption and wealth is always higher in bankruptcy than outside of bankruptcy. The covariance term is expected to be positive, since higher wealth in bankruptcy is associated with both lower marginal utility of consumption and lower labor supply. The fact that the marginal utility of consumption and labor supply are positively correlated makes bankruptcy insurance more valuable to risk averse consumers. This is because when wealth is low, reduced consumption and higher labor supply both make consumers worse off and, when wealth is high, increased consumption and lower labor supply both make consumers better off. Because the positive correlation intensifies the risk that consumers face, bankruptcy insurance

²³ This refers to the fact that consumers choose the values of N_b and N_n so as to maximize their utility functions. As a result, the terms involving changes in labor supply are the same in consumers' utility functions and in the social welfare function, so that they cancel out in the derivations of (6) and (7).

becomes more valuable. Taking these two terms together, the overall sign of the expression in square brackets in (6) is always positive. This means that the expression has a corner solution and the optimal earnings exemption m^* is 100%.

Now does this result change when the behavioral response terms are non-zero? Suppose first that $WE_m > 0$, so that labor supply increases as m rises. This change makes the overall sign of (6) more positive, so that the optimal earnings exemption is still 100%. Thus as long as loan markets operate when $m = 1$, the fresh start remains economically efficient when work effort is allowed to vary.²⁴

Now suppose PB_m is negative rather than zero. Because all of the other terms in expression (6) are positive, (6) can only equal zero if $\bar{U}'_n(PB_m)$ is large enough to offset all of the other terms in (6). In other words, the optimal earnings exemption is less than one only if consumers greatly increase their probability of filing for bankruptcy when the earnings exemption rises. In practice, (6) is likely to be positive at $m = 100\%$ even when PB_m is non-zero, since current U.S. law mandates the fresh start and we know that loan markets operate under these conditions.

Now turn to expression (7), the condition determining the optimal wealth exemption X^* . There are two reasons why the optimal wealth exemption will have an interior rather than a corner solution. First, if the wealth exemption were infinite, then loan markets would break down since no debtors would repay. The optimal wealth exemption is limited by the constraint that loan markets operate. Second, expression (7) is less positive than expression (6). Examine the insurance term in (7) first, which is $\bar{U}'_{b2} - \bar{U}'_n$. This term captures the gain to risk-averse consumers from bankruptcy-provided wealth insurance and must be positive if consumers are risk averse, but it is smaller than $\bar{U}'_b - \bar{U}'_n$ in expression (6). Also there is no positive covariance term in (7) as there is in (6). Also the term $F(\hat{W}) - F(X + S)$, which multiplies $\bar{U}'_{b2} - \bar{U}'_n$, approaches zero as X increases (while the analogous term $\bar{N}_b f(\hat{W})$ in (6) is increasing in m).

²⁴ Note that if consumers are risk neutral rather than risk averse, $\bar{U}'_b = \bar{U}'_n$ and $\text{cov}(U'_b, N_b) = 0$, so that the sign of the term in square brackets in (6) is zero. However WE_m is still positive. As a result, the optimal earnings exemption is smaller when consumers are risk neutral than when they are risk averse.

$F(\hat{W}) - F(X + S)$ is the probability of consumers being in region 2 of figure 1—the higher wealth bankruptcy region. As X increases, eventually all consumers have wealth that is less than the exemption and they fall in region 1 of figure 1, so that $F(\hat{W}) - F(X + S)$ approaches zero. Finally, the two behavioral response terms WE_X and PB_X are both negative, so that they reduce the value of expression (7). All of these factors imply that expression (7) has an interior rather than a corner solution and that the optimal value of X is less than infinite.

Thus the analysis suggests that, if consumers are risk averse and their bankruptcy filing behavior is not strongly responsive to increases in the exemption levels, then the optimal bankruptcy exemption policy is the fresh start combined with a less-than-infinite wealth exemption. The only situation when the fresh start is non-optimal occurs when consumers greatly increase their probability of filing for bankruptcy when the earnings exemption rises.

Current U.S. exemption policy under Chapter 7 involves the fresh start and a variable wealth exemption that depends on individual debtors' state of residence. Six states have unlimited exemptions for equity in owner-occupied homes and, since wealth can be fairly easily shifted into or out of home equity, the unlimited home equity exemption essentially acts as an infinite wealth exemption—at least for homeowners in these states. But even in these six states, loan markets operate (although empirical evidence suggests that less credit is available in these states--see Gropp, Scholz and White, 1997). This suggests that the optimal policy of a 100% earnings exemption and a reasonably large wealth exemption is compatible in practice with loan markets operating.

Extension of the model to allow variable work effort in period 1. Finally, the model just discussed does not allow consumers' period 1 effort level to vary and I now re-examine the model when this restriction is dropped. Dropping this restriction is of interest because additional work effort in period 1 allows consumers an alternative means of insuring their own consumption in period 2, since additional period 1 work effort benefits consumers by providing them with additional consumption insurance in period 2.

Suppose the model is changed so that, for each additional hour that consumers work during period 1, their period 2 wealth increases by an and/or their period 2 wage rate is

multiplied by $(1 + \mathbf{bn})$, where \mathbf{a} and \mathbf{b} are either small positive numbers or zero. If $\mathbf{a} > 0$, then additional earnings in period 1 are used for a financial investment that has a positive and certain return in period 2. Each additional hour of work in period 1 raises period 2 consumption by \mathbf{an} dollars in regions 1 and 3 of figure 1 (but consumption remains the same in region 2 of figure 1). If $\mathbf{b} > 0$, then additional earnings in period 1 are used for an investment in human capital that raises the consumer's wage rate in period 2. Each additional hour of work in period 1 raises period 2 consumption by $m(1 + \mathbf{bn})N_b$ in regions 1 and 2 of figure 1 and by $(1 + \mathbf{bn})N_n$ in region 3 of figure 1.

Redoing the above analysis to incorporate these changes, the condition at which debtors are indifferent between filing versus not filing for bankruptcy becomes:

$$U(\tilde{W} + \mathbf{an} - B(1+r) + (1 + \mathbf{bn})N_n, N_n) = U(X + m(1 + \mathbf{bn})N_b, N_b) \quad (1')$$

where \tilde{W} is the new threshold level of wealth at which consumers are indifferent. Wealth and earnings are both higher in period 2, but the wealth exemption remains the same and debtors in bankruptcy must repay more from earnings. As a result, debtors are less likely to file for bankruptcy, i.e., $\tilde{W} < \hat{W}$ and $F(\tilde{W}) < F(\hat{W})$.

The first order conditions for the optimal earnings and wealth exemption levels become:

$$(1 + \mathbf{bn})\bar{N}_b F(\tilde{W}) \left[\bar{U}'_b - \bar{U}'_n + \frac{\text{cov}(U'_b, N_b)}{\bar{N}_b} \right] + \bar{U}'_n [(1 + \mathbf{bn})EB1m' + EB2m'] \quad (6')$$

$$(F(\tilde{W}) - F(X + S - \mathbf{an})) \left[\bar{U}'_{b2} - \bar{U}'_n \right] + \bar{U}'_n [(1 + \mathbf{bn})EB1X' + EB2X'] \quad (7')$$

Here $X + S - \mathbf{an}$ is the new wealth level at the border between the low and high bankruptcy regions in figure 1 (regions 1 and 2). The average marginal utility terms, $\bar{U}'_b, \bar{U}'_{b2}$ and \bar{U}'_n , are now evaluated over the redefined regions. $EB1m'$, $EB1X'$, $EB2m'$, and $EB2X'$ denote the new values of the excess burden terms.²⁵

²⁵ $EB2m' = [\tilde{W} + \mathbf{an} - X - S + (1 + \mathbf{bn})(1 - m)N_b - B(1 + r)]f(\tilde{W})(d\tilde{W} / dm)$, and $EB2X'$ is defined similarly. $EB1m'$ and $EB1X'$ are the same as $EB1m$ and $EB1X$, except that they are evaluated at \tilde{W} rather than \hat{W} .

Expressions (6') and (7') have the same form as (6) and (7) and therefore the same arguments made above are still valid. Thus as long as consumers are risk averse and bankruptcy filing behavior is not too opportunistic, the efficient exemption policy is still the fresh start combined with a non-infinite wealth exemption.

IV. Simulation Results

Wang and White (2000), hereinafter WW, recently developed a simulation model that is quite similar to the model just discussed. They assume that there is a single bankruptcy procedure in which debtors are obliged to use both wealth and post-bankruptcy earnings to repay debt and they solve for the optimal wealth and earnings exemption levels. The WW model differs in several ways from the model discussed here, but the most important difference is that the WW model incorporates two types of consumers—strong versus weak opportunists. The weak opportunists behave in exactly the same way as consumers in the model just discussed, while the strong opportunists are assumed to hide some of their wealth from the bankruptcy trustee when they file for bankruptcy. Since hiding wealth increases the gain from filing, strong opportunists are more likely to file for bankruptcy than weak opportunists and strong opportunists increase their probability of filing for bankruptcy by more than weak opportunists in response to a given change in exemption levels. In WW's model, individual consumers choose whether to be strong or weak opportunists based on the interaction of a randomly distributed ethics parameter and the wealth exemption. The higher the wealth exemption, the more attractive it is for consumers to become strong opportunists. Because lenders are unable to identify individual consumers' types, all consumers borrow on the same terms. This means that as more consumers become strong opportunists, interest rates rise and credit becomes more scarce holding everything else constant. Strong opportunism reduces the efficiency gain from having higher exemption levels, since higher exemption levels encourage additional consumers to become strong opportunists and therefore make normal consumers worse off.²⁶

²⁶ WW assume that strategic consumers only hide wealth in bankruptcy, not earnings. Other differences between their model and this one are that WW assume that bankruptcy costs are a fraction of wealth rather than a fixed dollar amount and WW treat the loan size (B) as endogenous.

WW first solve for the optimal bankruptcy policy when all consumers are weak opportunists. An important result of their model is that, without strong opportunism, the optimal bankruptcy policy is always the fresh start combined with an intermediate wealth exemption. These results suggest that the fresh start policy is optimal whenever there is only “normal” opportunistic behavior. The 100% earnings exemption provides consumers with consumption insurance, while the lower-than-infinite wealth exemption discourages consumers from filing for bankruptcy too often and therefore driving up interest rates.

However when WW introduce strong opportunism, they find that it is sometimes efficient to abolish the fresh start. In particular, suppose strong opportunists hide 10% of their wealth when they file for bankruptcy. Then the fresh start is no longer optimal and the most efficient earnings exemption falls from 100% to 85%. Lowering the earnings exemption is particularly effective in discouraging consumers from becoming strong opportunists, since strong opportunists file for bankruptcy more often and therefore repay more from post-bankruptcy earnings than normal consumers. As a result, abolishing the fresh start penalizes them more heavily than normal consumers and so is particularly effective in discouraging strongly opportunistic behavior. This suggests that abolishing the fresh start is sometimes efficient when there are multiple types of consumers and the strong opportunists repay more from post-bankruptcy earnings than the normal types.

But WW find that abolishing the fresh start is not always optimal, even in the presence of strong opportunism. Suppose strong opportunists hide 20% rather than 10% of their wealth in bankruptcy. Then WW find that the optimal bankruptcy policy is again the fresh start, now combined with an even lower wealth exemption. In addition, suppose strong opportunists hid some of their earnings rather than their wealth from the bankruptcy trustee. Then increases in the earnings exemption would be less effective in discouraging strong opportunists from filing for bankruptcy and this would make the fresh start more likely to be efficient. Thus even in the presence of multiple consumers types and strong opportunism, the fresh start is sometimes the most efficient bankruptcy policy.

WW’s simulations also illustrate how the wealth and earnings exemptions may act either as substitutes or complements. In the theoretical model discussed above, it was

generally optimal to set high levels for both exemptions, i.e., they act as complements. But when one type of consumer behaves strongly opportunistically, the two exemptions may become substitutes. The optimal policy then sets one exemption at a low level to discourage strong opportunism, while setting the other at a high level to provide consumption insurance. The results of WW's simulations suggest that the earnings exemption is generally—but not always—preferable for providing consumption insurance.

V. Conclusion

In this paper, I develop a personal bankruptcy model that takes account of the two most important objectives of personal bankruptcy—encouraging efficient work effort by debtors before and after bankruptcy and providing debtors with consumption insurance. The model solves for the optimal bankruptcy exemption levels for earnings and wealth, focusing on whether and when the “fresh start”—the policy of exempting 100% of post-bankruptcy earnings from the obligation to repay—is economically efficient. The results suggest strong support for the fresh start policy. If opportunistic behavior is non-existent or weak, then the optimal policy is the fresh start combined with the highest wealth exemption that is consistent with loan markets operating. The only circumstances under which the fresh start is not economically efficient is when there are multiple consumer types, asymmetric information, and one type of consumer behaves strongly opportunistically in a way that makes bankruptcy filing behavior very responsive to changes in the earnings exemption.

The U.S. Senate has recently passed a bankruptcy reform bill that would make the fresh start unavailable for bankruptcy filers unless their household income is below the median level in their state of residence. Debtors whose income is above the median level would be required to file for bankruptcy under Chapter 13 rather than Chapter 7. In addition, the bill also makes filing for bankruptcy under Chapter 13 less attractive. Rather than debtors proposing a repayment plan that the judge rubber-stamps (as occurs under the current Chapter 13), instead the judge would order a repayment plan based on a formula that requires debtors to use a large fraction of their incomes to repay. The

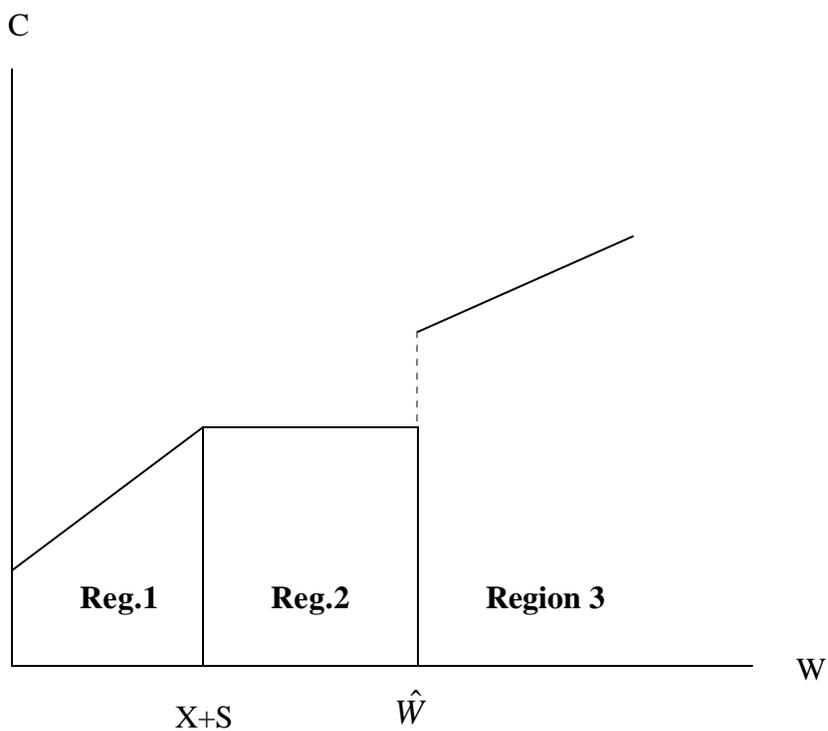
reform is likely to cause debtors who have above-median earnings to avoid filing for bankruptcy completely (unless they can qualify to file under Chapter 7 by temporarily quitting their jobs or reducing their work hours). Thus the reform is equivalent to forcing debtors who have above-median incomes to waive their right to file for bankruptcy. The results of the model suggest that, first, that the proposed reform will reduce the efficiency of the bankruptcy system by reducing risk averse debtors' consumption insurance. And, second, because few bankruptcy filers have more than the median income, the proposed reform will probably cause little reduction in the number of bankruptcy filings. This means that the bill is unlikely to benefit the average borrower very much, i.e., interest rates will not fall appreciably and credit availability will not rise.

References

- Adler, Barry, Ben Polak, and Alan Schwartz, "Regulating Consumer Bankruptcy: A Theoretical Inquiry," *J. of Legal Studies*, vol. XXIX, pp. 585-613 (June 2000).
- Baird, Douglas, "A World Without Bankruptcy," *Law & Contemporary Problems*, vol. 50:2, pp. 173-193 (Spring 1987).
- Bebchuk, Lucian A., 2002, "The Ex Ante Costs of Violating Absolute Priority in Bankruptcy," *J. of Finance*, February 2002; 57(1): 445-60.
- Buckley, F.H. (1994), "The American Fresh Start," *Southern California Interdisciplinary Law Journal*, vol. 4, pp. 67-97.
- Domowitz, Ian, and Michelle Alexopoulos, "Personal Liabilities and Bankruptcy Reform: An International Perspective," *International Finance*, vol. 1, pp. 127-159, 1998.
- Fan, Wei, and Michelle J. White, "Personal Bankruptcy and the Level of Entrepreneurial Activity," *Journal of Law & Economics*, vol. 46:2, October 2003, pp. 543-568.
- Fay, Scott, Erik Hurst and Michelle J. White, "The Household Bankruptcy Decision," *American Economic Review*, vol. 92:3, June 2002, pp. 706-718.
- Gertner, R., and D. Scharfstein, 1991, "A Theory of Workouts and the Effects of Reorganization Law," *J. of Finance*, vol. XLIV, pp. 1189-1222.
- Gropp, Reint, J. Karl Scholz, and Michelle J. White, "Personal Bankruptcy and Credit Supply and Demand," *Quarterly J. of Economics*, vol. 112, pp. 217-252 (1997).
- Jackson, Thomas H., *The Logic and Limits of Bankruptcy Law*. Cambridge: Harvard University Press, 1986.
- Jensen, Michael C., and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics*, Oct. 1976; 3(4): 305-60.
- Lin, Emily Y., and Michelle J. White, "Bankruptcy and the Market for Mortgage and Home Improvement Loans," *Journal of Urban Economics*, vol. 50:1, July 2001 (138-162).
- Longhofer, Stanley D., "Absolute Priority Rule Violations, Credit Rationing, and Efficiency," 6 *J. of Financial Intermediation* 249-67 (1997).
- Posner, Eric A., "Contract Law in the Welfare State: A Defense of the Unconscionability Doctrine, Usury Laws, and Related Limitations on the Freedom to Contract," *J. of Legal Studies*, vol. 24, 283-319 (1995).

- Posner, Eric A., "The Political Economy of the Bankruptcy Reform Act of 1978," *Michigan Law Review*, vol. 96, pp. 47- (1997).
- Povel, Paul, 1999. "Optimal 'Soft' or 'Tough' Bankruptcy Procedures," *J. of Law, Economics, and Org.*, vol. 15(3), pp. 659-684.
- Rea, Samuel A., "Arm-breaking, Consumer Credit and Personal Bankruptcy," *Economic Inquiry*, vol. 22, pp. 188-208 (1984).
- Stiglitz, J.E., "Some Aspects of the Pure Theory of Corporate Finance: Bankruptcies and Take-Overs," *Bell Journal of Economics and Management Science*, Autumn 1972, vol. 3, pp. 458-482.
- Sullivan, Teresa, Elizabeth Warren, and Jay Westbrook, *As We Forgive Our Debtors*. New York, NY: Oxford University Press (1989).
- Wang, Hung-Jen, and Michelle J. White, "An Optimal Personal Bankruptcy System and Proposed Reforms," with Hung-Jen Wang. *Journal of Legal Studies*, vol. XXXIX(1), pp. 255-286, Jan. 2000.
- Webb, David (1991), "An Economic Evaluation of Insolvency Procedures in the United Kingdom: Does The 1986 Insolvency Act Satisfy the Creditors' Bargain?" *Oxford Economic Papers*, vol. 43, pp. 139-57.
- White, Michelle J., "The Costs of Corporate Bankruptcy: A U.S.-European Comparison," in *Corporate Bankruptcy: Economic and Legal Perspectives*. J. Bhandari and L. Weiss, eds. Cambridge University Press (1996).
- White, Michelle J. (1998), "Corporate Bankruptcy," in *The New Palgrave Dictionary of Economics and The Law*, P. Newman, editor.
- White, Michelle J., "Why Don't More Households File for Bankruptcy?" *J. of Law, Economics, and Organization*, vol. 14, pp. 205-231 (1998a).
- White, Michelle J., "Corporate Bankruptcy as a Filtering Device: Chapter 11 Reorganizations and Out-of-Court Debt Restructurings," *J. of Law, Econ. and Organization*, vol. 10, Oct. 1994, pp. 268-295.
- White, Michelle J., "Why It Pays to File for Bankruptcy: A Critical Look at Incentives under U.S. Bankruptcy Laws and A Proposal for Change," *University of Chicago Law Review*, vol. 65, pp. 685-732 (1998b).
- White, Michelle J., "Personal Bankruptcy Under the 1978 Bankruptcy Code: An Economic Analysis," *Ind. L.J.*, vol. 63, p. 1 (1987).

Figure 1:
Period 2 Consumption as a Function of Wealth



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