

Ex-Ante vs. Ex-Post Efficiency in Personal Bankruptcy Proceedings

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Abstract:

Amidst a sharp increase in household debt levels, many countries have substantially reformed their consumer bankruptcy regulations. I first classify the mechanisms triggered by current U.S. and European bankruptcy regulations and then evaluate these mechanisms within a hidden action model. I analyze the consumer's incentives prior to distress and during a 'period of good conduct' following bankruptcy, appraising the capacity of existing regulations to implement those conflicting objectives. Though the institution of debt release provides adequate bankruptcy regulation ex-post, the prospect of debt release also distorts the debtor's choices prior to distress. I propose alternative regulations that provide superior incentives, minimizing the overall distortions at both dates. A numerical example illustrates the findings.

Keywords: Personal Bankruptcy, Limited Liability, Moral Hazard, Law & Economics

JEL - Classification: D18, D91, K35, G33

1. Introduction

An increasing number of consumer goods, such as cars, furniture or electronic equipment, are bought on credit. This more frequent use of credit reflects both a change in attitude towards borrowing, and an increased accessibility of credit, due to a deregulation of consumer credit. Consumers can now shift consumption more easily to their most preferred period, allowing for a less constrained inter-temporal utility maximization. However, amidst this more frequent use of credit, default rates have multiplied. In the United States, for instance, filing rates have quintupled in the last fifteen years.²

To counter this development, many industrialized countries have reformed (or are in the process of reforming) their personal bankruptcy laws. The objectives of these reforms differ. In countries with a traditionally debtor friendly regulation, such as the U.S.A., regulations are being strengthened to prevent consumers from profiting upon default. In countries at the other extreme, such as Germany, a regulated consumer debt release has been newly introduced (where none used to exist) to allow the overindebted consumer a path back to normal life. As a result of these various reforms, bankruptcy regulation in most industrialized countries are becoming more harmonized.

From a normative standpoint consumer bankruptcy regulations should aim to maintain a consumer's incentives for effort.³ In general, two tools are used in modern bankruptcy regulations: the seizure of current assets, and the garnishment of future income for a certain period (here referred to as 'period of good conduct'⁴). I classify the instruments employed by existing bankruptcy regulations, and uses a hidden-action framework to analyze their impact on the debtor's work incentives pre- and post-distress. A trade-off is identified: *ex-post* debt release is shown to be necessary to preserve effort incentives post default. Yet, the very prospect of this *ex-post* alleviation may *ex-ante* impair the debtor's incentives to honor her credit obligation. I analyze the capacity of existing bankruptcy regulations to resolve this conflict and implement efficient effort choices at both dates. The results of the analysis are used to create a proposal for bankruptcy reform.

Formally, I evaluate the influence of bankruptcy regulation on a consumer's effort choices. The

²See ABI World <http://www.abiworld.org/ContentManagement/ContentDisplay.cfm?ContentID=18753> Similar developments are witnessed in other countries – to wit, 3.13 million households are classified as overindebted in Germany (Schuldenreport (2006)).

³Restoring working incentives post default for overindebted individuals has in fact been the major motivation for the introduction of debt release in many European countries (see Graver (1997)). The U.S. Supreme Court has identified " ...a new opportunity in life and a clear field for future effort" as an objective of a fresh start already in 1934 (see *Local Loan vs. Hunt*).

⁴The period of income garnishment following bankruptcy is here referred to as 'period of good conduct' as it is named in the German regulation

qualitative findings indicate that moral hazard is present both pre-filing and during the period of good conduct. As is shown in the ex-post section, the concept of debt release calls for a sophisticated procedure that gives the debtor the opportunity to re-enter and participate productively in the market after the period of bankruptcy. Intuitively, the debtor should not be overly taxed during the period of good conduct, since the return to the creditor largely depends on the debtor's future economic performance. If the transfer to the creditor is too taxing, the debtor may choose an insufficient effort or entirely refrain from participation, which, in turn, would diminish the return to the creditor and cause a welfare loss. Likewise, ex-ante, the debtor should somehow be discouraged from incorporating the prospect of future debt release into her decisions. The core issue is that, when the strategic debtor knows that her debts will be released, she has less incentive to avoid bankruptcy. The analysis shows that the trade-off between ex-ante and ex-post efficiency will persist for any bankruptcy regulation. I present a reform proposal that offers a second best solution to minimize welfare losses. In a nutshell, the proposal calls for the debtor to repay a fixed sum that is based upon her current assets and future income. This fixed sum satisfies both needs. A numeric example illustrates these findings.

The paper is organized as follows: Section **2** sums up the legal background and discusses the contribution to the law and economic literature, along is an overview of existing legal regulations. Section **3** introduces the model used for the analysis in Sections **4** and **5**. Section **6** discusses the assumptions and results, and points at possible extensions. Section **7** concludes.

2. Legal Background and Extant Literature

The known history of personal bankruptcy law dates back almost four thousand years to the code of Hammurabi,⁵ which awarded a fresh start to the debtor after three years of debt bondage. In contrast, in the Middle Ages, with few exceptions, harsh penalties, such as debtors' prison, were imposed on defaulting debtors.⁶ In modern-times England (1705) and the United States (1898) first granted debt release to non-merchant debtors (see Robe, Steiger & Michel (2006)). In Continental Europe, however, specific regulations allowing consumers to petition for a partial discharge of their

⁵In Art. 117 of the Code of Hammurabi (1789 B.C.) debt release was already instituted: „If any one fail to meet a claim for debt, and sell himself, his wife, his son, and daughter for money or give them away to forced labor: they shall work for three years in the house of the man who bought them, or the proprietor, and in the fourth year they shall be set free.“ (translation in the Eleventh Edition of the Encyclopedia Britannica, 1910 by Claude Hermann Walter Johns).

⁶One exception is the 'Las Siete Partidas' introduced in 1342 by Alfonso X in Spain, which stated that once proceedings have been completed old debt could no longer be called.

debts did not appear until the 1990s.⁷

The path to debt release often differs across national legislations. Aside from any moral requirements,⁸ most stipulate either the seizure of the individual's current non-exempt assets, the garnishment of future income, or both. The period of income garnishment⁹ is usually of a fixed length, and not -as advocated in this paper- determined by a fixed amount.

The **U.S.** bankruptcy regulation offers two distinct procedures to the defaulting consumer. Under *Chapter 7* "straight liquidation", the debtor is obliged to use her entire existing assets beyond an exemption level to repay her debt but does not have to give up any future earnings. In contrast, *Chapter 13* "adjustment of debts for individuals with regular income" allows her to retain current property, and instead proposes a payment plan to creditors conveying part of her future earnings to repay the debt - usually covering a period of three to five years. Despite the detailed nature of the repayment plan, the fresh start is not contingent upon the fulfillment of the plan.¹⁰ Since the enactment of the *Bankruptcy Abuse Prevention and Consumer Protection Act*¹¹ in October 2005, only those debtor's passing a 'means test' are allowed to file under Chapter 7.¹² The reform aims at increasing the creditors' return that the debtor repays the maximum she can afford.¹³

In the largest **European** country, Germany, the insolvency code ('Insolvenzordnung,' henceforth *InsO*) was substantially reformed in 1999 and 2001. It newly introduced the possibility of debt

⁷ Precisely, Denmark started the process in 1984. It instituted a debt release procedure for "hopelessly indebted" debtors that later served as a model for other Scandinavian countries, with Finland, Norway and Sweden following suit between 1992 and 1994 (Niemi-Kiesilainen (1997)). In France, the "Loi Neiertz" came into effect in 1990 (Kilborn (2005)). It served as a model for Belgium in 1999 and Luxembourg in 2001 (Kilborn (2006)). In Austria, legislation providing for consumer debt release was enacted in 1994 Holzhammer (1996)). In England, substantial reforms were carried out in 1990 and again in 2004. Germany started allowing for consumer-debt discharge in 1999. Similar regulations were introduced in the Netherlands in 1998 (Kilborn (2006a)). In Italy, regulations for consumer debt discharge are only being discussed – and the current insolvency legislation still concerns only merchants.

⁸ Many bankruptcy regulation call for mandatory credit counseling as part of the debt release procedure (e.g. the U.S., England, Germany, Canada etc.)

⁹ Here referred to as the 'period of good conduct' as it is named in the German regulation.

¹⁰ According to Section 1329 (a) of Title 11 of US Code the plan can be modified at any time upon request of an interested party, this means payments as well as the duration of the plan can be increased or reduced. Also according to Section 1328 (b) the court may grant a discharge to a debtor that has not completed payments.

¹¹ Endeavors to reform consumer bankruptcy regulation have been around for years. In 2000 in his final days Bill Clinton declined the legislation by his pocket veto. The bill finally took all legislative hurdles in March 2005 (H.R. 975) (S.256) and became public law No: 109-8. For a summary of the reform and interest group intervention see Nunez and Rosenthal (2004).

¹² "Debtor presumed to be abusing Chapter 7 if current monthly income, excluding allowed deductions, secured debt payments, and priority unsecured debt payments, multiplied by 60, would permit a debtor to pay not less than the lesser of (a) 25% of nonpriority unsecured debt of \$ 6,000 (or \$ 100 a month), whichever is greater, or (b) \$ 10,000." (Jeweler (2005), CRS-2 Means test, 11 U.S.C. §§ 704, 707 presumed abuse.

¹³ While before the enactment of the reform about 70% were choosing Chapter 7, White (2007) estimates that now about 78% of all filers would pass the means test and be allowed to file under Chapter 7.

release for individual debtors *without* the creditors' approval.¹⁴ The procedure is protracted and demands at least one out-of-court and one in-court attempts for settlement.¹⁵ If these attempts fail, the court may rule to have the debtor's entire assets liquidated and to have all income beyond subsistence level garnished over the next six years. Upon fulfillment of these requirements, a debt release can be granted by the court.

Similar regulations exist in Austria, Belgium, the Netherlands and Sweden. While most of these regulations pay no particular attention to the debtor's ex-post incentives (i.e. whether the debtor works hard during the period of good conduct), some incentive schemes are found. For instance, the Austrian regulation promises a debt release after three years, provided the debtor has paid back 50% or more of her unsecured debt. Otherwise, debt can be discharged after seven years at the earliest (Holzhammer (1996)). One feature of the Canadian law is closer to the proposal advocated in this paper. A debtor owing less than C \$ 75,000 can avoid the seizure of her assets by submitting a 'consumer proposal,' if she can get the creditors' consent to a plan to pay off the debt within five years. Yet, at any stage the consumer is entitled to switch to liquidation (McGregor, Kingander & Lown (2001)). Both of those countries laws provide the debtor with incentives to work hard, but only within a limited range of cases. To wit the Austrian regulation only incentivizes the debtor to work hard, but only if she has a reasonable prospect of paying back 50%, while the debtor's main incentive for economic performance under the Canadian 'consumer proposal' is to retain her assets. For comparison, in the U.S.A. between 1994 and 2000, 95% of all Ch. 7 cases were so called 'no-asset' cases (Kilborn (2006)).¹⁶

As the above suggests, today almost all industrialized countries do offer regulated debt release procedures for consumers. Rea (1984) and Aghion and Hermalin (1990) show that such legal intervention in consumer debt contracts may improve welfare. They argue that, without mandatory debt release, low-risk debtors may commit to excessive default penalties in order to signal their quality. At the same time, the fresh start is often justified as an insurance against bad income realizations, though many papers find the U.S. bankruptcy laws liable to encourage consumers to engage in (costly) activities to shield their assets from the creditor's grasp prior to filing.^{17,18} Bolton

¹⁴See §§ 286 et seq. InsO for the detailed regulations.

¹⁵An out-of-court settlement needs the creditors' unanimous consent; and still, the in-court settlement demands the approval of a majority of the heads and sum of debts.

¹⁶About 70% of all non-business bankruptcy filings are under Chapter 7 (see ABI World).

¹⁷Under U.S. bankruptcy law a consumer may profit from the privilege of chapter choice (White (1998) and Wang & White (2000)), unequal exemption rates (Weiss, Bhandari and Robins (2001)) or the different treatment of secured and unsecured credit (Berkowitz & Hynes (1999)).

¹⁸For an extensive literature surveys see Hynes & Posner (2002).for consumer finance, White (2005a) and Robe et

& Rosenthal (2002) consider the impact of debt moratoria on credit markets in an agricultural economy. They find that ex-post debt relieve is always beneficial, since otherwise too many farmers would then be forced to work as laborers. Yet, ex-ante credit markets may collapse when debt moratoria are anticipated. On the empirical side, however, Han & Li (2004), using data from the Panel Study of Income Dynamics (PSID), find no positive impact of the fresh start on working hours.

A different rationale for consumer friendly bankruptcy laws is offered by Posner (1995), who demonstrates that the non-waivable right for debt release counterbalances the consumers' incentive to overborrow under the protection of the welfare system. A quantitative analysis of the consumer's temptation to overborrow is conducted by Athreya (2002) and Chatterjee et. al. (2005). They use computational equilibrium analysis to evaluate the welfare effects or the current changes of the U.S. bankruptcy code. Athreya's results support the abolishing debt release, while Chatterjee et al. conclude that means testing enhances welfare.

In this paper, I do not look at the consumer's decision to borrow or the macroeconomic effects of bankruptcy law on the credit market. Rather, I focus on the bankruptcy law's objective to preserve a consumer's working incentives. I assume the need for limiting a consumer's liability, and explore the consequences of such limits on a consumer's effort choices prior *and* post bankruptcy.

Adler, Polak and Schwartz (2000) look at the debtor's working incentives prior to bankruptcy. They analyze the trade-off between the insurance benefits of the fresh start and the moral hazard arising from strategic behavior. However, in practice, the seizure of assets often provides little compensation to the creditors. Therefore, the garnishment of future income may be preferred, with respect to creditors' return and with respect to ex-ante deterrence. Wang and White (2000) also model ex-ante decision about efforts and they show that requiring debtors to surrender parts of their current assets and of their future earnings reduces incentives for strategic filing.

Several papers discuss how wage garnishment should be structured in order not to impoverish post bankruptcy effort incentives. When it is difficult for creditors' to seize a defaulting debtor's income, Dawsey & Ausubel (2004) show that debtor's may instead opt for informal bankruptcy, i.e., refuse further payments. Zaborowski & Zweifel (1999) show that a 100% garnishment of wages may lead to a decline in labor supply, and argue in favor of partial garnishment. White (2005b) extends the analysis of Wang and White she finds that a fresh start is better than U.S. Chapter 13 with respect to these incentives. Bigus & Steiger (2003),(2006) look at post-bankruptcy working

al. (2006) for the various effects of bankruptcy regulations.

incentives. They show that a variable period of good conduct helps to preserve the effort incentives.

In this paper, I ask how bankruptcy regulation, and post bankruptcy garnishment rules in particular, should be structured to preserve effort incentives. I link ex-ante and ex-post considerations, endogeneizing the limits of liability.

3. The Model

An individual debtor (she) borrows money at $t = -2$ from a creditor in order to buy an asset A , some consumer good such as a car. The credit becomes fully due in $t = -1$. There are no interim payments. The debtor's expected future wealth in $t = -2$ is a random variable $\tilde{w} \in \{w, 0\}$. With probability $(1 - \delta)$ she is bankrupt in $t = -1$, and seeks protection under the applicable bankruptcy regulation and having to meet the requirements for discharge. The time structure is illustrated in Figure 1. I discuss the effects of four stylized regulations on the behavior of the individual debtor. First the ex-post situation is analyzed, viewing the individual's choices during the period of good conduct. These ex-post findings are taken to analyze the debtor's choices ex-ante and the effects on the credit market.

Figure 1 about here

3.1. Setting

The debtor files for bankruptcy (at $t = 0$) and has a time horizon of T periods $t \in \{1, \dots, T\}$.¹⁹ In each of these periods her income y_t is a random variable:

$$y_t = \begin{cases} y_1, & \text{with prob. } \pi \\ y_2, & \text{with prob. } (1 - \pi). \end{cases} \quad (1)$$

With probability π she earns y_1 , and alternatively, with probability $(1 - \pi)$, she earns y_2 , $y_1 > y_2 \geq 0$. The debtor can influence these probabilities by choosing an effort level at costs $c_i \in \{c_h, c_l\}$, $c_h > c_l > 0$. The effort level influences the probability of income realization, with π_h and π_l for high and low effort respectively. Income realizations and probabilities are independent of both the previous and future realizations or effort choices. For notational convenience the following abbreviation is used $y_h = \pi_h y_1 + (1 - \pi_h) y_2$ and $y_l = \pi_l y_1 + (1 - \pi_l) y_2$. To indicate per period variables I use lower-case letters, and for lifetime variables capital letters are used.

¹⁹This can be regarded as her remaining lifetime or working time. For simplicity, the time horizon is fixed and known to the parties.

The model is, furthermore, based on the following assumptions:

1. While both the debtor and the creditor aim at maximizing their returns, in particular the debtor is maximizing her lifetime income. The debtor's effort choice cannot be observed by the creditor nor by some third party, e.g. the bankruptcy court. Rather, only realized income is observed. However, the probabilities for the states, as well as the costs of each level of effort, are known to the parties ex-ante.

2. High effort is assumed to be efficient, and reservation utility is normalized to zero, $U_0 \equiv 0$:

$$\pi_h y_1 + (1 - \pi_h) y_2 - c_h > \pi_l y_1 + (1 - \pi_l) y_2 - c_l > u_0 \equiv 0 \quad (2)$$

3. The outstanding debt is assumed to be fixed at all dates, there is no interest or discount rate. The debtor has no seizable assets or other belongings at the date of filing, i.e. $A = 0$. The resale value of the asset that has been financed with the credit is zero.

4. The considered income, y_t , is viewed as disposable income, i.e. it can be entirely garnished during the period of good conduct. Costs of effort are private costs to the debtor - they are not deducted from income. I abstract from the problem of exemption rates, or subsistence levels. The amount deemed to meet the basic subsistence level would either be earned by the individual or provided by social security.

3.2. *Conventionalized Bankruptcy Regulations*

Based on the survey section, four regulations are now analyzed in this stylized setting.²⁰ When talking about the prerequisites for debt release in general, I use the letter P (for penalty or prerequisite) to indicate the task the debtor has to fulfill to qualify for a fresh start. The payment to the creditor, made by the debtor per period, is indicated by small letter p_t with $\sum_t p_t = P$. P looks as follows under the various regulations:

- **Chapter 7:** When the debtor files under Ch. 7 of the U.S. Bankruptcy Code, all her current non-exempt assets are seized to satisfy creditors' claims, after which all remaining debt is discharged. In terms of the model this means $P = A (= 0)$, since the asset is assumed to have no seizable value at the time of filing.

²⁰For tractability, certain differences in the various regulations are discounted. For example, the differentiation between the right for a fresh start, as provided by U.S. law and the fact that a fresh start may be granted under German law.

- **No Debt Release:** The debtor has to repay the entire amount of remaining debt, i.e. $P = D$. This regulation is also referred to in the literature as unlimited liability and was basically the German Regulation (or lack thereof) before 1999.
- **German Regulation or period of good conduct:** Under the Insolvency Code of 1999 the debtor's non-exempt assets are seized and during a so-called 'period of good conduct' her disposable income is entirely garnished. If she is in good standing a debt release is granted at the end of this period. The creditor thus receives the asset and six years of income as compensation: $P = A + 6y_t$.
- **Proposal:** In this regulation debt release is conditional on the payment of some fixed amount. This amount is either the original debt $P = D$ or some maximum amount P^{\max} which is determined according to the individual debtor's ability.

4. Ex-Post Analysis

After filing for bankruptcy the debtor has to meet the requirements of the bankruptcy regulation in order to obtain a release from remaining debt. I address, in particular, how these requirements affect the debtor's choices and the impact on the creditor's collection rate.

According to assumption (2) the first-best outcome is achieved when the debtor chooses a high effort in each subsequent period. She does so when both her participation and incentive compatibility constraints hold, in particular, during the repayment period.

$$T [\pi_h (y_1 - p_1) + (1 - \pi_h) (y_2 - p_2) - c_h] \geq U_0 \equiv 0. \quad (3a)$$

$$\begin{aligned} & \pi_h (y_1 - p_1) + (1 - \pi_h) (y_2 - p_2) - c_h \\ \geq & \pi_l (y_1 - p_1) + (1 - \pi_l) (y_2 - p_2) - c_l. \end{aligned} \quad (4)$$

The indices p_1, p_2 indicate the penalty payment per period with a high (y_1) and a low (y_2) realization of income respectively. Furthermore, the ideal rule should encourage the debtor to work hard (see ass. (2)), while minimizing the loss to the creditor, i.e. $\min_P D - P(y_i)$.²¹

²¹Yet, from a pure welfare perspective only the debtor's economic matters. The creditor has no active part ex-post, yet his collection rate matters ex-ante. The distribution of returns is non-consequential.

4.1. Performance of Existing Rules

Under U.S. **Ch. 7** there is little reason for an ex-post analysis, since after the seizure of assets the remaining penalty is zero. Both (4) and (3a) always hold. From a pure ex-post welfare perspective, this rule should be favored as it never causes any distortions. However, the creditor receives the lowest compensation of all discussed regulations, which will matter with respect to ex-ante incentives.

At the opposite end of the policy choice spectrum, **no debt release** perfectly solves the creditor's minimization problem. No debt is discharged, i.e. $P = D$, thereby minimizing the loss imposed on the creditor. In addition the *IC constraint* (4) perfectly holds, since $P_1 = P_2 = D$, and the two penalties cancel one another out. However, for certain values, the participation constraint (3a) may fail to hold

$$P \geq T(\pi_h y_1 + (1 - \pi_h) y_2 - c_h) \equiv P^{\max}. \quad (5)$$

Hereinafter P^{\max} is defined as the maximum amount the consumer would be willing to pay. For values of debt exceeding P^{\max} , the debtor would refrain from any attempt to repay. As a result, both parties are worse off. Outstanding debt is more likely to exceed P^{\max} the smaller T is, the lower the debtor's income expectation, y_h , is, and the higher her personal costs of effort, c_h , are.

Being aware of this effect, the current **German regulation** does not insist on full repayment.²² Rather they have opted to place various limits on the debtors obligation to pay. After her assets have been seized, her income is garnished for the next six years.²³ Each realization of income would be entirely seized, i.e. $y_1 = p_1$, $y_2 = p_2$, and she will be released from remaining debt as long as she does not blatantly offend her postulated duties during the period of good conduct

$$\begin{aligned} (T - 6)[\pi_h y_1 + (1 - \pi_h) y_2] - T c_h &\geq (T - 6)([\pi_h y_1 + (1 - \pi_h) y_2] - c_h) - 6c_l \\ &\Leftrightarrow c_l \geq c_h. \end{aligned} \quad (6)$$

²²Contingent on the fact that the remaining debt is sufficiently large so that the debtor cannot repay P within the period of good conduct. If so, she would try to accomplish the prerequisite as quickly as possible. Hence, she would choose the high effort level even within the period of good conduct. This happens only if: $P \leq m(y_h - (c_h - c_l))$. Here the high effort level is more than compensated by future income.

²³She will participate in the regulation if her remaining lifetime income after is sufficient to - at least - compensate her for her endeavors during the period of good conduct (i.e. $(T - 6)(y_h - c_h) - 6c_l \geq 0$ holds).

This, of course, never holds. It is never rational for her to generate more than the minimum level of income to meet the requirement of 'good standing.' Nonetheless, at least some income is generated to satisfy the creditor, since the debtor participates.

4.2. *Proposal*

The existing U.S. and German regulations suffer from certain shortcomings. Building from these observations, I propose a modified regulation. The regulation 'no debt release' provides undistorted incentives as long as P is not too large. Hence, a payable amount, $P \leq P^{\max}$, is set as prerequisite for debt release. This incentive is congruent, since a fixed amount puts the debtor in the position of the residual claimant. The penalty imposed on the debtor under the proposed rule is thus:

$$P = \min \{D, P^{\max}\} \tag{7}$$

Note, that this threshold P^{\max} is individually determined by the debtor's capabilities, i.e. her education, age, social situation as well as the general economic situation. In terms of the model P^{\max} is dependent on her remaining lifetime T , the variance in income y_1 and y_2 and the costs of effort c_i . In the worst case, the debtor gets U_0 . If, on the contrary, the penalty would only depend on the original debt, then the debtor may in some cases not be willing to participate in the procedure. Hence, setting a fixed amount that does not overstrain the debtor's capabilities will set optimal ex-post incentives.

4.3. *Inter-temporal Effects*

The fulfillment of P may take several periods. In particular, due to the uncertainty in income realizations the duration of payment under the proposed regulation may vary.²⁴ Contingent on previous realizations the duration may be shortened or prolonged. In the worst case, when realizations had been low repeatedly, P may become too high and the debtor opts for a second bankruptcy. Then, similar to 'no debt release' when $P > P^{\max}$, the debtor ceases all efforts.²⁵ Moreover, in anticipation of such a 'second bankruptcy' the debtor may strategically adjust her efforts. Put differently, the fixed sum is no longer perceived as fixed by the debtor.

²⁴Evidently, these considerations do not apply to Ch. 7 or a regulation with a fixed period of good conduct such as the German regulation.

²⁵Note, that the limits and possible distortions discussed in this section for the *proposal*, are aggravated for *no debt release*. Though the debtor may work hard first towards repayment, she may in later periods halt all efforts when several realizations turn out low.

In this section, I discuss possible alleviation of this problem.²⁶ First stating the framework and then discussing three possible regulations: no hardship release, hardship discharge, and conditional hardship discharge.

4.3.1. Setting

Since the size of P is dependent on various factors, a general evaluation of the problem is not viable. Using an example, however, sufficiently illustrates the pros and cons of possible alleviations. Assume the following: A debtor has three periods of working time remaining ($t = T - 2, T - 1, T$), and is charged to pay $P = y$, i.e. the income of one period to obtain a debt release. Income in each period is a random variable,

$$y_t = \begin{cases} y & \text{with prob. } e \\ 0 & \text{with prob. } (1 - e) \end{cases} \quad (8)$$

The debtor's unobservable effort $e \in [0, 1]$ influences the likelihood of the positive realization. Efforts incur costs $c(e) = \frac{c}{2}e^2$. Where c and y are constant, and $c > y$ insures an interior solution. The first best effort in each period is thus $e^* = \frac{y}{c}$, which she would choose as the residual claimant. This gives the debtor a surplus of $S_d^* = \frac{y}{c}y - \frac{c}{2} \left(\frac{y}{c}\right)^2 = \frac{y^2}{2c}$, which is also the maximized social surplus. The ratio $\frac{c-y}{c}$ gives the remaining risk, which is inefficient to reduce. The performance of the rules can be measured contingent on this exogenous risk.

Figure 2 about here

Figure 2 illustrates the time structure. The debtor chooses e in each period, which determines the probabilities for the realization of the good and the bad state resp. The good realization occurs with probability e (earning y) and the bad with probability $1 - e$ (earning nothing). Once the debtor achieves a positive realization she can pay off, and will choose e^* henceforth. Otherwise the period of good conduct is prolonged.

4.3.2. No hardship release

As long as payments under the plan are not completed, the effort decisions in each period are not independent, as her major incentive to work hard today is the promise of income tomorrow. *Table 1* below gives the efforts and accumulated payoffs in each period, given previous attempts

²⁶The failure to complete payments under the plan seems non-negligible. In the U.S., for instance, only 30% of all Chapter 13 payment plans are completed (see Evans & Lown (2003)).

to pay had failed (i.e. going down the right branch of the tree). In early periods this unforgiving regulation provides high incentives. This is important in two respects: first it increases the expected collection rate of the creditor, second it lowers the likelihood of a prolongation of the period of good conduct and the problems attached to this. However those high incentives in the early periods come at a cost. When realizations turn out low, incentives degenerate in later periods, to the extreme that in period T a zero effort will be chosen.

Table 1 about here

In general the debtor chooses her effort in each period

$$\max_{e_t} e_t (y - P + (T - t) S_d^*) + (1 - e_t) S_{d(t+1)} - c(e_t) \quad (9)$$

contingent on the income realization (y or 0) the debtor will either pay off her obligation ($P = y$) in the current period, otherwise (with prob. $(1 - e_t)$ the next period's income ($S_{d(t+1)}$)) will be used to satisfy the creditors. According to the first order condition the effort chosen in each period is

$$e_t = \frac{(T - t) S_d^* - S_{d(t+1)}}{c}. \quad (10)$$

Either the debtor is successful in period t and pays off the required sum, or the period of good conduct will be prolonged an additional period. The larger the number of remaining periods, the more e_t converges towards e^* . Extending this example to four or more periods, shows that as the number of periods growth, P becomes less important for the effort decision. And e converges towards the first best, and the main difference becomes that P is either paid today or tomorrow, i.e. $\lim_{t \rightarrow T} e_{T-t} = \frac{y}{c}$. However, in the more frequent number of cases, fewer periods are left so that low realizations may seriously alter the debtor's decision problem. Various remedies could be taken against the distortions arising from the prospect of a 'second bankruptcy' within the period of good conduct.

4.3.3. Unconditional hardship discharge

A truncation of the period of good conduct (in this framework after two periods with low realizations) would only shift incentives one period forward. The debtor would then choose $e_{T-2} = y^2/2c^2$ and zero efforts in $T - 1$, since the most prudent move after a low realization in $T - 2$ would

be to wait for the period of good conduct to end. This regulations provides worse incentives and lower returns to all parties for all possible parameters.

Similar a probabilistic discharge provides always incentives worse to the no hardship release. Assume debt is discharge with the know probability $\sigma \in [0, 1]$. This is an intermediate case of the two discussed regulations: no-discharge ($\sigma = 0$) and unconditional discharge ($\sigma = 1$). For each $\sigma > 0$ the debtor would adequately reduce her efforts in prior periods. Again this form of hardship discharge regulation would come at the full expenses of the creditor.

4.3.4. Conditional hardship discharge

A *conditional discharge* instead could avoid this. After two unsuccessful periods, the debtor may petition for a hardship discharge. The judge or some authority then investigates her conduct in the previous period ($T - 1$). I assume evaluation to be cost less. For instance, evaluation costs may be kept low by shifting proof and require the informed party -the debtor- to provide evidence of her conduct, leaving the judge with appraising the evidence.²⁷

Table 2 about here

The judge receives a binary signal, $s \in \{0, 1\}$, on her effort. $s = 1$ occurs with prob σ , and reports that the debtor has been sufficiently diligent, while with prob. $1 - \sigma$ the signal $s = 0$ states otherwise. Assume that the probability for a favorable signal rises in prior efforts, $\sigma(e_{T-1})$, $\sigma' > 0$. In particular, I assume $\sigma = e_{T-1}$. The likelihood of discharge rises in efforts in $T - 1$, giving her an expected income of

$$S_{d(T-1)} = e_{T-1}(y - P + S_d^*) + (1 - e_{T-1})e_{T-1}S_d^* \quad (11)$$

and a first order condition of $e_{T-1} = \frac{y^2}{c^2 + y^2}$. When the debtor knows, that her efforts will be appreciated, even when outcomes are not favorable, she raises her efforts in $T - 1$.

Table 2 gives the effort and returns of the participants. Though this regulation provides superior incentives in the second period, this comes at the cost of lower incentives in the first period. This is because the reevaluation eases the loss from mal performance. Figure 3 below shows the social surplus created by the discussed rules (first best, no hardship release and conditional release), depending on the ratio y/c . Since it is difficult to assess how much risk the debtor faces in income

²⁷For a thorough discussion on the costs and benefits vs. the precision monitoring see Demougin and Fluet (2001).

realization a debtor faces after bankruptcy, I give the performance of the entire range. The upper line gives the benchmark solution, the second line (starting in the left upper corner) is the regulation without hardship discharge, which only outperforms the conditional discharge regulation when the ratio $y/c > 0.88$.²⁸ For the remaining parameters, i.e. when the probability of low realization is greater than 22% in a period, than reevaluation provides better results.

Figure 3 about here

Summary of the results: Several conclusions can be drawn from this stylized model. First, the debtor should not be reduced to her reservation utility, as any variation in income can seriously distort incentives. For a bankrupt individual the possibility of a renewed distress cannot be ignored. Second an unconditional as well as a probabilistic hardship discharge always lower the social surplus. Since the prospect of a hardship discharge is likely to spoil incentives in the early periods, thus making distress more likely. Third, nonetheless, the duration of the period of good conduct should be truncated. The analysis has shown that linking the hardship discharge to an investigation offsets the temptation of strategic behavior. For practical purpose, imagine that the expected length of the period of good conduct may be three years and a the debtor may petition for a hardship discharge after five or six years. As the numerical example in Sec. 5.4 will demonstrate, this should also sufficiently serve as an ex-ante threat.

5. Ex-Ante Analysis

The above analysis has shown that, from an ex-post perspective, debt release should always be part of a bankruptcy code. Here, I investigate whether the prospect of debt release distorts the debtor's endeavors to repay her credit so that the bankruptcy provisions affect the costs and availability of credit adversely.²⁹

5.1. Setting

In accordance with the time structure (see Figure 1) I focus now on the dates $t = -2$ to $t = 0$:

- The debtor borrowed a credit or a loan L at $t = -2$ to buy some asset A , which gives her a benefit Λ . The loan is due at $t = 0$ with a payment of D .

²⁸When the ratio $y/c < 0.75$ conditional hardship release even provides a higher expected return to the creditor.

²⁹see e.g. White (1998), Hynes and Posner (2002).

- Meanwhile, at $t = -1$, the debtor can acquire some wealth \tilde{w} , with $\tilde{w} \geq D$,³⁰

$$\tilde{w} = \begin{cases} w, & \text{with prob. } \delta \\ 0, & \text{with prob. } (1 - \delta). \end{cases} \quad (12)$$

This wealth is subject to a random shock: with probability δ , $\delta \in [0, 1]$, the debtor is fortunate and earns w and pays D . With probability $(1 - \delta)$ her endeavors do not prove fruitful and she must seek protection under the applicable bankruptcy regulation. The debtor can influence the probability δ at cost at costs $k(\delta)$ with $k' > 0, k'' > 0$, and $k(0) = 0$ and $k(1) = \infty$. The debtor's choice cannot be observed, while income realizations are assumed to be observable and verifiable.

- For parsimony, accumulated ex-post income is written as $Y_k = T(y_i - c_i), k \in \{S, B\}$.³¹ With S and B indicating the solvent and insolvent state resp. Future income expectations, i.e. income after $t = 2$, are assumed to remain unchanged due to bankruptcy, while the debtor's effort decision may well change as a result of the bankruptcy provision.
- The creditor who operates on a competitive market, expects zero profits

$$\delta D + (1 - \delta) P - L = 0. \quad (13)$$

As follows, the additional condition for insolvency ought to be set so that the payment in the bad state cannot exceed the one in the good state

$$D \geq L \geq P \geq 0. \quad (14)$$

P -or more precisely an upper bound for P - is determined by the applicable bankruptcy regime. Hence, the creditor's only latitude is to adjust D so that (13) holds.

³⁰One might also think of w as the income of several periods as L might be rather large, and it takes the debtor in case of distress several periods to pay P .

³¹When the debtor is solvent, she will choose the efficient effort e_h in each following period. When she is insolvent, her effort decision is subject to the provisions of the applicable bankruptcy code, as it was discussed in the ex-post analysis.

5.2. First Best

The social optimum is found by jointly maximizing the returns of both participants $Y_D + Y_C$ i.e. (17) + (13). Additionally, at the first-best the debtor's ex-post choices are not distorted, $Y_S = Y_B$.

$$\max_{\delta} \Lambda - L + Y_S + \delta w - k(\delta) \quad (15)$$

which when being maximized yields:

$$w = k'(\delta^*). \quad (16)$$

Equation (16) states, effort decision should only depend on income in that period. Yet, facing a particular bankruptcy regulations the debtor chooses δ in order to maximize:

$$\max_{\delta} \Lambda + \delta(w - D + Y_S) + (1 - \delta)(Y_B - P) - k(\delta). \quad (17)$$

In the solvent state she earns w and pays D to the creditor and has furthermore a future income of Y_S . In the insolvent state the debtor's return in $t = 1$ is zero, while she has to pay P from her future income Y_B .

Borrowing is rational for the debtor in $t = -2$, $U_C \geq U_{NC}$, with the index C and NC representing the utility with a credit and no credit respectively. At time $t = -1$, the debtor decides on both the effort level and on whether or not to take the credit. Likewise, the creditor chooses D at time $t = -1$.

5.3. Performance of Various Rules

Given the ex-post consequences, I now evaluate how the various regimes affect the ex-ante situation: namely the availability of credits, the charged risk premium and, most important, the debtor's effort decision at $t = -1$ that determines the default probability. The debtor chooses δ according to:

$$w - (D - P) + (Y_S - Y_B) = k'(\delta). \quad (18)$$

Solving (18) for δ determines the default probability that the debtor chooses. Since the payments in case of distress are lower, $P \leq L \leq D$, and also the debtor is unlikely to adjust her efforts upwards, $Y_B \leq Y_S$, the prospect of debt release is likely to decrease ex-ante efforts, $\delta^* > \delta$. It remains to be shown that the extent of debt release is larger than the loss in future income for all discussed

regulations, i.e. $D - P \geq Y_S - Y_B$. Otherwise the threat of a diminished future income would outweigh for the benefits of debt release and cause the debtor to surpass first best precautions.

When filing under U.S. **Chapter 7**, the debtor's effort decision *ex-post* is not distorted, i.e. $Y_S = Y_B$. Since the debtor is assumed to lack assets $P = A = 0$, the creditor increases D to $L = \delta D$. The debtor chooses her effort according to

$$w - D = k'(\delta). \quad (19)$$

Hence, this rule only diminishes the debtor's current return giving her little incentive to raise her precaution against insolvency. Ch. 7 creates the largest ex-ante distortions of all discussed regulations. This effect may be mitigated through a larger income, w , or the existence of non-exempt property.³²

No debt release falls on the other extreme. The debtor has unlimited liability for the debts, with her entire current and future belongings. Two cases need to be differentiate between :

- $P \leq P^{\max}$ and
- $P > P^{\max}$.

For the former ($P \leq P^{\max}$), the analysis is relatively straightforward, resulting in no distortions: The creditor always receives the entire outstanding debt and has no need to charge a default premium, i.e. $L = D = P$.

The latter case ($P > P^{\max}$) is different. As the ex-post analysis has shown, this regulation involves a welfare loss. The remaining debt exceeds the debtor's expected future income, i.e. $P > Y_{S/B}$. The debtor prescinds from any effort, resulting in an expected income of $Y_B = 0$. This, in turn, causes the creditor's recovery rate to drop to zero ($P = Y_B = 0$). Even though, the creditor's ex-ante expected collection rate in case of distress is equivalent to the one of Chapter 7, effects are different. Defaulting comes at the cost of loss of future income.

$$w - D + Y_S = k'(\delta). \quad (20)$$

$D = \frac{L}{\delta}$ is the payment to the creditor in the good state, equivalent to Ch. 7. However, δ will be significantly higher. The creditor can holds Y_S as ransom, which neither will get in case of distress.

³²For a discussion of the effects of collaterals and the effects of personal appreciation of a collateral in reaffirmations, see Adler et al. (2000).

Yet, the debtor's precautions will not exceed δ^* . (20) shows that this happens when $Y_S > D$. Which is unlikely in the present set-up. $P > P^{\max}$ implies that $Y_S < P$.³³ Hence, even in the solvent state her future income would be insufficient to pay the debts, $D \geq P > P^{\max} = Y_{S/B}$. Substituting this into (20), shows that the selected δ will be smaller than δ^* . As a consequence, the creditor will have to increase the risk premium. The smaller Y_S is in comparison to L the smaller is the precaution the debtor will take. This situation is particularly likely to occur when the debtor has only a few working periods left.

Under the current **German InsO**, the debtor's liability is bounded to her assets and income during the period of good conduct. In terms of the model $P = 6y_{ll} + A$. The debtor's income differs ex-post due to the distorting effects of this regulation: $Y_S = T(y_h - c_h)$ and $Y_B = (T - 6)(y_h - c_h) - 6c_l$.

$$w - D + 6(y_h - c_h - c_l) = k'(\delta) \quad (21)$$

substituting in (13) gives:

$$w - \frac{L}{\delta} + \frac{1 - \delta}{\delta} 6y_{ll} + 6(y_h - c_h + c_l) = k'(\delta). \quad (22)$$

The distorting effect of the regulation is captured in (22) showing that there is a wedge between the creditors' return and the effect on the debtor. The debtor loses in case of distress is constituted by w plus the potential income of the six years $6y_h$, yet she saves on her effort costs $6(c_h - c_l)$. The selected δ is lower than in the first-best (16), $\delta < \delta^*$, given that outstanding debt exceeds the collected amount during the period of good conduct.

For the **proposal**, as under the regulation of no debt release, one distinguish between $D > P^{\max}$, and $D \leq P^{\max}$. Ex-post effort decision remains unchanged, i.e. $Y_S = Y_B$. With $P \leq P^{\max}$ the creditor faces no risk at all. Distortions in the debtor's ex-ante choice may arise only, when $D > P^{\max}$. Still, the risk premium charged will remain moderate, since there is no welfare loss is involved ex-post, and the creditor can expect some return.

$$w - \frac{L - P^{\max}}{\delta} = k'(\delta) \quad (23)$$

The greater the difference between L and P^{\max} , the smaller is the δ that the debtor will choose. Note, that the creditor still receives a considerable (based on the debtor's capabilities) amount in

³³Because future income expectations are assumed to remain unchanged during distress so long as the bankruptcy regime is non-distorting, i.e. $Y_S = Y_B$.

the insolvent state, and the debtor is bound to her reservation utility in case of distress, so that she has little expected gain. This means that for debts exceeding P^{\max} , the debtor may choose $\delta < \delta^*$, but it is the least distorting of all discussed regulations. This will be further illustrated by the numerical example below.

To summarize: The analysis suggests that any form of debt release may cause a risk-neutral debtor to lower her precaution ex-ante against bankruptcy below the first best, $\delta < \delta^*$. Even when the debtor has unlimited liability, distortions may be observed.

5.4. Numerical Example

The analysis shows that any kind of debt release is capable of distorting the debtor's effort decision ex-ante. Yet, one may wonder about the extent of distortion created by each discussed regulation. This section aims at a quantification of the discussed effects. This method is the sensible tool to compare the effects of the various regulations, given the lack of statistical data and the profound differences between the environments of the discussed regulations. The numeric exercise focuses on how the level of debt-repayment (D) varies with an increase in the size of the loan (L). This represents the contract the debtor will be offered for a particular seize of credit, because the creditor's only latitude in the credit contract is D . The creditor raises D in response to a higher risk of distress and a decreased satisfaction rate, P . Put differently, D represents the risk premium charged by the creditor. The higher the disparity between L and D , the greater is the distorting effect of that regulation ex-ante. The debtor's participating decision (whether to take the loan) is driven by the benefit Λ , which is exogenous to the analysis. This implies that when the risk premium becomes rather large, the debtor will be unlikely to take the credit, it is equally possible also that the creditors will refrain from extending a loan to the debtor.

The following numbers are assumed for calculations: The post-bankruptcy income is set to $Y_S = 26,400\text{€}$ and pre-bankruptcy income is $w = 35,000\text{€}$. Assuming $w > Y_S$ is necessary to arrive at situations where debt release is ex-post necessary. The relation $L \leq w$ is set so the debtor is capable of paying her entire debt off in the solvent state, as debt is due in full at $t = 2$. Furthermore, I assume for post-bankruptcy income $y_h - c_h = 2,200\text{€}$ and $y_l - c_l = 1,400\text{€}$. Remaining working time after $t = 0$ is twelve periods, which means $Y_S = 12 * y_h = 26,400\text{€}$. From this, payments in the bankrupt state can be deduced:

Table 3 about here

Table 3 lists the four discussed regulations, and the last row comprises a modified form of the proposal. Here the maximal amount is limited to 20,000€, which adds up to an expected duration of 4,25 years of payment. I introduce this modified proposed to account for the possible distortions discussed in section 4.3. In this case the debtor retains an expected surplus of 6,000€. The first column displays the post bankruptcy income resulting from the three existing regulations and two forms of the proposed regulation. When a regulation comprises distortions ex-post, two possible post-bankruptcy incomes arise. The second row indicates the maximum amount for which the regulation remains undistorted, where $D = P$, and consequently the first income in row one applies. The last row gives the creditor's return. This consists of two values for two different events. First when the debtor pays the entire sum even in case of distress, when L does not exceed the amount displayed in the second column, and second, when the debt bankruptcy regulation is applied thereby demanding some maximum amount from the debtor.

According to the analysis, the debtor's choice of δ is dependent on her first order condition as stated in (18). The assumed cost function is $k(\delta) = -x\delta \ln(\delta - 1)$, and the derivative is accordingly $k'(\delta) = \frac{x\delta}{(1-\delta)}$. Where x is some parameter that determines the curvature of the function. It is convenient to set $x = 5,600$. This cost function satisfies the properties set up in the ex-ante setting.³⁴ Using these parameters and analyzing an $L \in [0; 35,000]$ the following graph results. With these parameters the first best probability is set to $\delta^* = 0.8642$. The graph below states the relationship between D development and a rising L under each of the various bankruptcy regulations. The bisecting line, represents the seize of the loan L .

Figure 3 about here

The graph illustrates that as the loan rises, the required debt payment rises in equal proportion so long as debt is paid in full in both states. When the payments start to differ, the creditor has to demand an increased D in order to insure his participation. For *Chapter 7*, D rapidly rises and then accelerates to infinity when the loan exceeds 16,200€ For that sum a debt payment of 35,000€ would be demanded (when $P = 0$). However, at that stage a credit contract would not be offered any more, as the debtor's expected income is insufficient to cover the payment (represented by the dotted line.) *No debt release* is another interesting case. Here the there are no distortions up to $P \leq P^{\max} = 26,399€$, and then it leaps up (here $D = P = L$) to 31,209.45€ for a loan of 26,400€.

³⁴A suitable cost function should have the following properties (i) $k(0) = 0$, (ii) $\lim_{\delta \rightarrow 1} k(\delta) = \infty$, (iii) $k'(\delta) > 0$. These conditions (i) - (iii) insure $k''(\delta) > 0$, and hence concavity of $k(\delta)$ in $[0, 1)$.

It is interesting to note that no credit would be offered as soon as D deviates from L . Though the *German regulation* entails a welfare loss ex-post, ex-ante distortions seem to remain quite moderate. Again the welfare loss inherent in the regulation can also be witnessed in the graph as D leaps up from 22,200€ to 22,971€ for an additional Euro of credit. Yet, the risk premium remains moderate, as D only rises at a slightly increased rate compared to L . As a result the German regulation outperforms the no debt release regulations for higher values of L . Although, there is no welfare loss inherent in the regulation, the *modified proposal* features similar characteristics. The amount collected by the creditor is higher, while the expected length is shorter (only 4,25 years). Consequently, the increase in risk premium rests below the German regulation. For the proposal there are no distortions until P^{\max} is reached, afterwards D rises at a moderate rate. This again shows, that the proposed regulation creates the least distortions of all considered regulations.

6. Discussion

The analysis has shown that to release the debtor of some of her prior debt may be necessary ex-post. While only a full fresh start can guarantee undistorted economic performance, employing a proper incentive scheme can generate some return for the creditor without spoiling the debtor's incentives. Ex-ante, on the other hand, the prospect of an immediate fresh start may tempt the debtor towards less care. Solving this trade-off, limiting distortions at both dates, should be at the heart of a bankruptcy procedure. The analysis has shown that a fixed sum set as a prerequisite for debt release attends to both of the postulated objectives of a bankruptcy regulation: a sufficient ex-ante threat and non-distorting working incentives ex-post. While the expected duration may in part be left to political choice, the magnitude of P will vary with the individual debtor's non-exempt expected future income. The numerical example suggests that an expected duration of four years may well suffice. Furthermore, since for a bankrupt individual the possibility of a renewed distress cannot be ignored, provisions for a hardship discharge need to be taken. The distortions arising from the strategic anticipation of a hardship discharge can be mitigated, when this discharge is made contingent on previous efforts.

The analysis abstracts from seizable property. Though this assumption captures reality,³⁵ it may, nonetheless, be an interesting extension to analyze incentives when P can be paid off with both assets and income. Furthermore, effort is assumed unobservable, and income realizations

³⁵For instance see Evans and Lown (2003) "Although chapter 7 debtors who own sufficient assets can be required to sell some assets above state or federal limits, most filings are no-asset cases."

are perfectly independent. Though monitoring may unravel effort choices,³⁶ this would normally incur high costs on the monitoring authority. Instead, the proposed reform reduces this costly activity to marginal cases. Equally, the consumer's ability to alter effort level may be challenged. Once someone has found employment it is difficult to reduce working hours, making the action easily observed. However, the individual may become less devoted to her job, thereby increasing the probability of being dismissed. In reality, a bankrupt individual is often unemployed, and the efforts to find a job can easily be adjusted by the individual.

Employing the proposed regulation demands the estimation of future income. Several existing regulations comprise such an element, e.g. the Canadian regulation or U.S. Chapter 13. However, none of these regulations leave the fulfillment to the debtor's autonomy. Under Ch. 13, for instance, the plan can be easily adjusted when projected income exceeds actual income. Under the Canadian regulation, failure to fulfill the orderly payment plan causes the loss of protection from creditors' seizure. Also a conversion to liquidation is always possible. The novelty of the proposed regulation is to present the debtor with a task that lies within her capacities. Giving the debtor autonomy with respect to the speed of fulfillment incentivizes her to work hard during the post bankruptcy period.

While all participants were considered risk neutral, which neglects the insurance role of the personal bankruptcy system, the paper did find a different reason for debt release. The state's interest in the debtor's economic performance. In Steiger (2005) I extend the model, allowing for risk aversion, and show that the basic incentive structure is not altered by assuming risk aversion on the side of the debtor. This analysis assumes a perfectly competitive credit market, which is taken for convenience. Even if creditors were able to charge an interest rate above the market rate it would not alter the results of the analysis as the decision to take credit is taken prior to the present analysis.

The paper does not provide statistical support for its findings. In most European countries statistical data on consumer bankruptcy is elusive. For example the German regulation was enacted only in 1999 and it has not yet been possible for anyone to complete the period of good conduct. In addition, in this paper various regulations and proposals from different jurisdictions are evaluated. This makes a direct comparison extremely difficult. Undoubtedly, the availability of some data would strengthen the results.

³⁶For instance, the local court in Hamburg dismissed a debtor from his period of good conduct because he only had a part time job, which the court found to be an insufficient effort.(see AG Hamburg 20.Nov. 2000 Az: 68e IK 15/99)

7. Conclusion

Consumer credit enables an individual to smooth consumption over time, thereby shifting it to the most rewarding period. However, when income realizations turn out to be low, the consumer experiences difficulty in meeting her credit obligation. This raises the necessity of a regulated debt release, as its absence may deter the consumer from further economic activity and thereby cause a welfare loss. Due to a striking increase in filing rates, consumer debt release regulations underwent (or are still undergoing) substantial reform in the United States and most European countries. Three devices, which qualify the consumer for a debt discharge, are identified across legislations: seizure of current assets, garnishment of future income, and non-monetary penalties. This paper offers a unified framework to analyze the incentive effects of such regulations. The model explicitly integrates the ex-post limits of liability into the analysis of credit contracts. The analysis shows that debt release is an inevitable property of a bankruptcy regime ex-post. Many of the existing regulations are shown to distort the individual debtor's effort choice ex-post, as these regulations pay little attention to the debtor's incentives during the period of good conduct and to her financial capabilities. Based on this understanding of consumer bankruptcy regulations, a new regulation is proposed. This proposal provides an alternative second-best solution which minimizes the distortions in the present set-up.

Testing the proposed rule for ex-ante incentive effects, namely on the debtor's incentive to avoid distress, any kind of debt release is shown to incentivize the debtor to lower ex-ante precaution. In contrast, the proposed regulation is shown to cause the least distortions at both dates. A numerical example suggests that, although any kind of debt release causes ex-ante distortions, the proposal reduces such distortions. The debtor is likely to take sufficient precaution against distress even when she expects some debt release. To put it in a nutshell: When the regulation causes sufficient inconvenience, the debtor will be sufficiently cautious. Equally, mitigations are better achieved, when the creditor's expected compensation is higher. However, from an ex-post perspective a regulated debt release is inevitable, as otherwise the debtor's incentives could be gravely distorted. The proposal offers a thoughtful debt release regulation that more adequately balances efficiency requirements at both dates.

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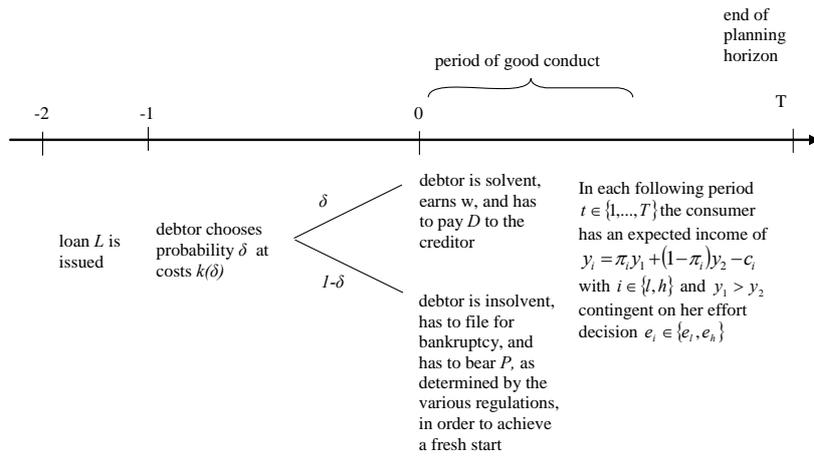


Figure 1: Time line

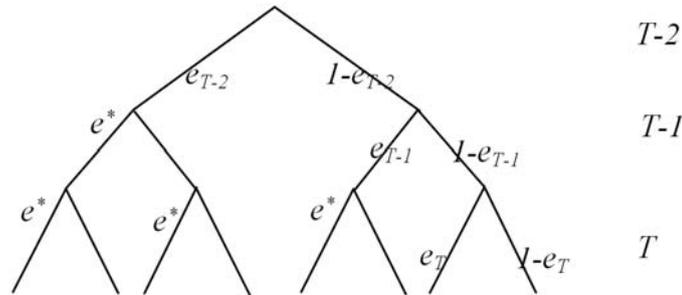


Figure 2: Time structure :inter-temporal ex-post with three periods The right branch represents low realizations. As long as the debtor did not complete the task for debt release P , her effort is below the first best.

nh	e_t	S_d	S_c
$T - 2$	$\frac{y^2(8c^2 - y^2)}{8c^4}$	$\frac{y^4(80c^4 - 16c^2y^2 + y^4)}{128c^7}$	$\frac{24c^4y^3 - 10c^2y^5 + y^7}{16c^6}$
$T - 1$	$\frac{y^2}{2c^2}$	$\frac{y^4}{8c^3}$	$\frac{y^3}{2c^2}$
T	0	0	0

Table 1. Inter-temporal ex-post: effort and surplus for the parties in each period with the unforgiving no hardship release rule (nh)

with $\sigma = e_{T-1}$	e_t	S_d	S_c
$T - 2$	$\frac{2c^2y^2+y^4}{2c^2(c^2+y^2)}$	$\frac{8c^4y^4+8c^2y^6+y^8}{8c^3(c^2+y^2)^2}$	$\frac{4c^2y^3+3y^5}{2(c^2+y^2)^2}$
$T - 1$	$\frac{y^2}{c^2+y^2}$	$\frac{y^4}{2c(c^2+y^2)}$	$\frac{y^3}{c^2+y^2}$
T	$0 \vee e^*$	$0 \vee S_d^*$	$0 \vee S_c^*$

Table 2 Inter-temporal ex-post. effort and surplus for the parties in each period with the a conditional hardship release rule (chr)

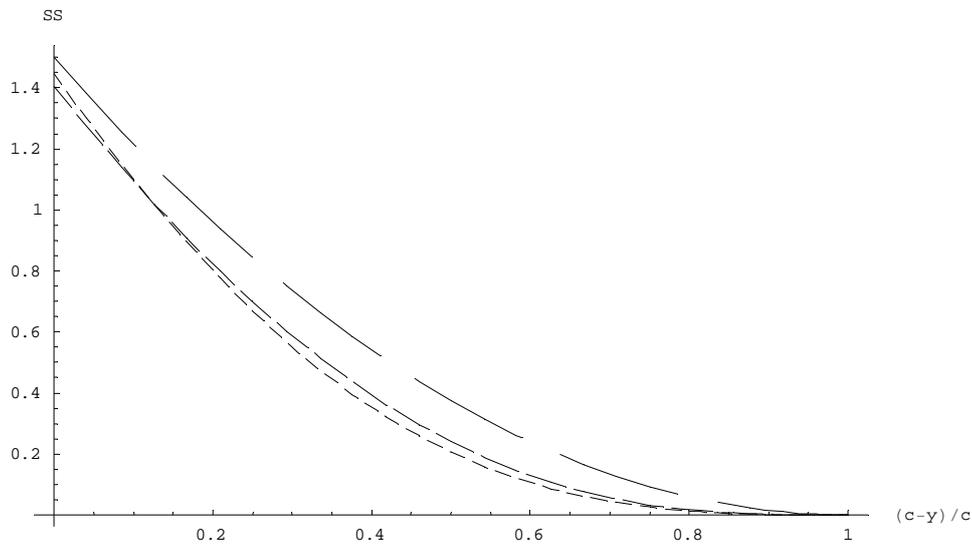


Figure 3: Intertemporal ex-post: social surplus generated by first best, no hardship release and conditional hardship release. The upper line represents the first best, while a conditional hardship discharge outperforms no hardship release for $(y - c) / c > 0.12$

(in €)	Y_B	max. P w/o dist.	P
Ch.7	26,400	0	0
no debt release	$26,400 \vee 0$	26,400	$L \vee 0$
Ger. Reg.	$26,400 \vee 21,600$	17,400	$L \vee 17,400$
Proposal	26,400	26,400	$L \vee 26,400$
mod. Prop.	26,400	20,000	$L \vee 20,000$

Table 3 Numerical example ex-ante

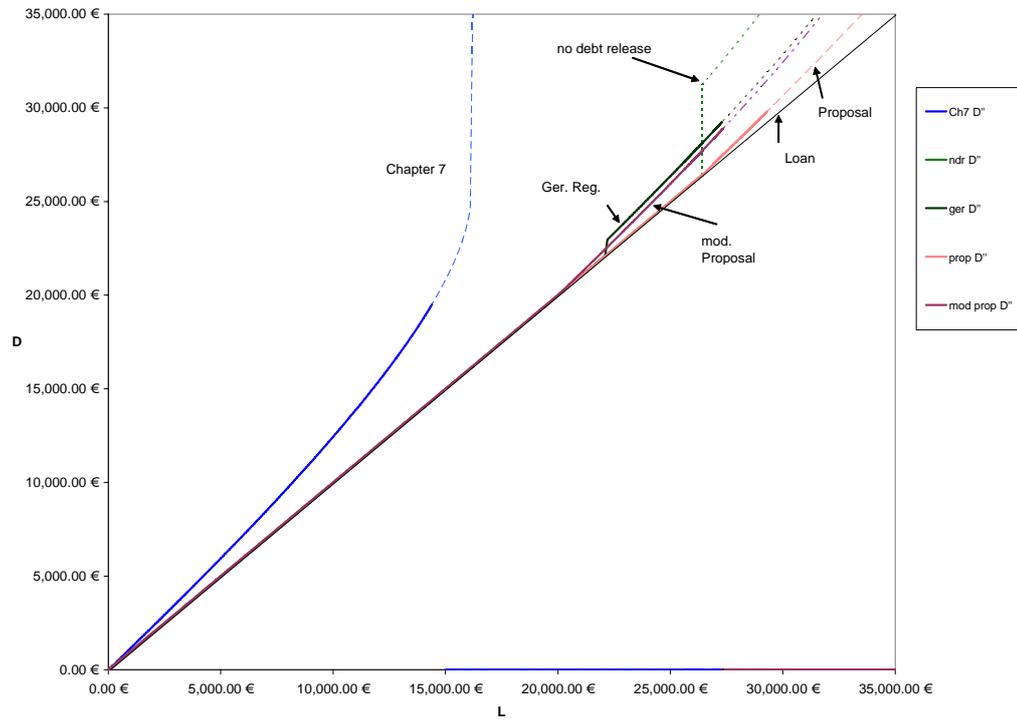


Figure 4: Numerical quantification of default premium charged under the discussed regulations