# The Realities of U.S. Personal Bankruptcy under Chapter 13

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**Abstract**

In this paper, we first present three main findings on the performance of consumer bankruptcy under Chapter 13 using a unique dataset based on information obtained from court docket records filed between 2001 and 2002 in the state of Delaware. First, the median creditor recovery rate is actually zero under Chapter 13 both for secured and unsecured debt. Second, close to twenty percent of filers are dismissed without ever obtaining confirmation of even one plan. Third, less than forty percent of debtors actually receive a financial fresh start by having their debts discharged. To account for these stylized facts, we then build a theoretical model of bankruptcy under Chapter 13. In the model, debtors make decisions regarding payment plan length as well as whether to stay in Chapter 13 after receiving shocks to their ability to repay. Structural estimations of the model highlight important trade offs between proposing a long plan versus a short one. A longer plan is costly in that debtors have to repay more under the plan, but it is more likely to be confirmed by the trustee. We also found that wage orders are important commitmment as well as enforcement devices that enure the success of Chapter 13 repayment plans. Finally, there exists substantial uncertainty regarding debtors payment ability that account for the failure and consequent low payment rate of many Chapter 13 cases.

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# 1 Introduction

On April 20, 2005, the "Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA)," was signed into law thus ending a comprehensive legislative effort that began under the Clinton administration. The most significant (and controversial) change introduced by the new personal bankruptcy law was to impose a "means test" on would-be-filers. The aim was to ensure that debtors with sufficient income would file under Chapter 13 and complete a repayment plan out of future income.[1] Despite the prominent role given to Chapter 13 in the reform act, there exists virtually no empirical evidence regarding how Chapter 13 actually performs both as a collection device for creditors, in particular unsecured creditors, and as a means to provide debtors with a financial fresh start.

In this paper, we first construct a novel data set and present extensive evidence on the actual performance of Chapter 13. The data we provide and analyze exploits information contained in court files related to all Chapter 13 personal bankruptcies filed in the Bankruptcy Federal Judicial District of Delaware between August 2001 and August 2002. We present three main findings. First, our data indicate that the median creditor recovery rate is actually zero under Chapter 13 both for secured and unsecured debt. Second, and related to the first observation, a relatively small faction of debtors are actually successful in getting discharged. Finally, despite the fact that our dataset predates the new law, and thus covers voluntary Chapter 13 filers only, about twenty percent of debtors never have their proposed repayment plan approved by the bankruptcy court.

These findings raise the following important questions: can the legal structure at the time along with debtors' characteristics account for the observations documented above? And more importantly, what does it imply about the effectiveness of the new bankruptcy law? To address these questions, we proceed to build a theoretical model where debtors make decisions regarding their proposed payment plan and whether to continue with the plan in the presence of shocks to their ability to pay while taking as given the trustee's decisions. The trustees' decisions include whether to impose a wage order and subsequently, whether to confirm or dismiss the plan before and after the realization of shocks to payment ability. Our structural estimation of the model highlights the tradeoff for debtors between proposing a long versus a short plan. A long repayment plan is costly as debtors have to pay more but it also yields a high probability of getting a wage order, getting confirmed both before and

[1] U.S. personal bankruptcy law also allows a debtor to file under Chapter 7, in which case the debtor obtains a discharge by surrendering his assets. Under Chapter 7, however, important state assets exemptions exist, such as unlimited homestead exemptions in Florida, that severely reduce creditors' ability to collect on loans in default. See section 2 for greater details.

after the payment shock, and thus, getting ultimately discharged. We also find that having a wage order highly increases the success rate of bankruptcy cases, suggesting the importance of a commitment and enforcement device. Finally, there does exist substantial uncertainty associated with debtors' ability to pay that account for the failure and thus low payment rate of many Chapter 13 bankruptcy cases.

The paper contributes to a growing area of research in consumer bankruptcy, whose aim is to assess behavioral as well as welfare consequences of different bankruptcy schemes. For the most part, the existing theoretical and empirical literature on consumer bankruptcy have proceeded in parallel ways. Empirical studies are typically concerned with establishing stylized facts and conduct statistical analysis outside the context of any theoretical framework. They have also focused mostly on consumer bankruptcy under Chapter 7. For example, researchers have looked into factors that are important for consumers' bankruptcy decisions (Fay, Hurst and White, 2002,, Buckley and Brignig 1998, Domowitz and Sartain, 1999, Gross and Souleles, 2002, Sullivan, Warren, and Westbrook, 1989, 2000, Warren 2003, 2005) and examined the effects of personal bankruptcy law on the supply of and demand for credit (Gropp, Scholz and White, 1997, and Lin and White, 2001), consumption (Filer and Fisher 2005, and Grant 2005), labor supply (Song and Li 2007), and mobility (Elul and Subramanian 2002). In recent years, in light of the many debates surrounding the proposal and eventual passage of BAPCA, a number of researchers have turned their attention to consumer bankruptcy under Chapter 13, documenting the profiles of the filers (Warren 2003, and Norberg and Velkey 2007), the performance of Chapter 13 bankruptcy (Norberg and Velkey 2007) and their relationship with, among other things, foreclosure laws (Porter and Twomey 2007).

Theoretical contributions in the consumer bankruptcy literature typically aim at providing tractable models that aim at explaining the documented empirical facts, but are in general not suitable for empirical analysis. For instance, a number of theoretical studies have used calibration and simulation exercises to explain the observed consumer bankruptcy filing rate in the economy and evaluate the effects of changes in bankruptcy laws on the welfare of the economy in general equilibrium settings (Athreya 2002, Chatterjee, Corbae, Nakamura, and Rios-Rull 2006, Li and Sarte 2005, Livshits, MacGee and Tertile 2007).

The contribution of our paper is that it brings together the two existing literatures by conducting structural estimations of a theoretical framework that is modeled after Chapter 13 bankruptcy. This exercise is especially important since it provides a natural framework for policy analysis using estimates from microeconomic data.

The remainder of this paper is organized as follows. Section 2 presents institutional details associated with U.S. personal bankruptcy law as well as a summary of creditors' options

outside bankruptcy. Section 3 provides a description of the data and its construction. We also document four measures of Chapter 13 performance: the discharge rate, creditors' recovery rate, and proposed plans' confirmation rate. In Section 4, we study how these measures are related to debtors' characteristics as summarized by income statement and balance sheet information, as well as demographic information. Section 5 offers some conclusions and directions for future research.

# 2 Legal Background

This section first briefly reviews creditors' legal remedies outside of bankruptcy. It then addresses the main features of U.S. personal bankruptcy law, and focuses in detail on Chapter 13 court procedures.

## 2.1 Creditors' Legal Remedies Outside of Bankruptcy

When a debtor defaults on his debt obligations without explicitly filing for bankruptcy, secured creditors, such as mortgage lenders or car loan lenders, will seize property to recover what they are owed. Unsecured creditors, such as credit card issuers, often start with making calls and writing letters soliciting payments. They then typically sell their debts to collecting agencies. Unsecured creditors also have the option to sue the debtor and obtain a court judgment against him. They collect on the judgment by having the court order that the debtor's employer take a portion of his paycheck and remit that money to the sheriff, who then forwards the payment appropriately. This process is known as "wage garnishment." Unsecured creditors can also potentially seize a debtor's bank account and/or foreclose on his home. Different states, however, restrict the amount and type of assets that can be seized to different degrees. Therefore, the process of seizing an account or foreclosing on a property can be costly and unsecured creditors rarely do so.

## 2.2 Main Features of U.S. Personal Bankruptcy Law

U.S. personal bankruptcy law features two distinct procedures: Chapter 7 and Chapter 13. Prior to the passage of the 2005 reform act, debtors had the right to choose between the two chapters.

Chapter 7 is often referred to as "liquidation." Under Chapter 7, the debtor surrenders all assets above an exemption level that varies across states. In exchange, he obtains the discharge of most of his unsecured debt. A debtor cannot file again for Chapter 7 during the

six years that follow the last filing. In contrast, Chapter 13 is formally known as "adjustment of debts of consumers with regular income." Under Chapter 13, a portion of a debtor's future earnings are used to meet part of his debt obligations. The repayment plan can last for a period of up to five years. While the debtor's assets are unaffected under Chapter 13, at the end of the payment plan, any remaining debt is discharged. A debtor is prevented from filing again under Chapter 13 for a period of 180 days following his last filing.

## 2.3 Bankruptcy Procedure under Chapter 13

A Chapter 13 case begins when a debtor files a petition with the bankruptcy court. This petition gives a description of, among other things, the debtor's assets, debts, income, and expenditures. The petition also details past income and lawsuit information. In the petition, the debtor also proposes a repayment plan that devotes all of his "disposable income" – defined as any income net of necessary living expenses (including insurance and mortgage payments) – to the payment of unmet claims. In order to be confirmed by the court, the proposed plan must be carried out for at least 3 years but cannot exceed 5 years. It must also be filed in good faith. In particular, the plan must propose to pay at least as much as the value of the assets creditors would have otherwise received under Chapter 7. Finally, the plan must cure any default on secured debt before providing for payments to unsecured creditors.

Upon the filing of a petition, a trustee is appointed by the bankruptcy court. The trustee serves primarily as a mediator between the debtor and his creditors during plan negotiations and renegotiations. He also works as a disbursing agent during the implementation of the plan, collecting payments from debtors and distributing them to creditors. Within a month of the petition filing, the trustee schedules a section 341 meeting. At this meeting, creditors are given an opportunity to ask any questions regarding the debtor's financial situation that may affect the plan. Upon completion of the meeting, the trustee makes a recommendation to the court in the form of a repayment plan. The court then decides whether to confirm the plan, reject the plan, or dismiss the plan.

If the plan is dismissed, the case ends. Creditors can resume legal remedies outside bankruptcy, as described above, to pursue the payment of their debts. If the plan is rejected, the debtor must propose a modified plan. Should the repayment plan be confirmed, the debtor starts making payments according to its specifications and, upon completion, any remaining debt is discharged.

It is worth noting that a confirmed plan can always be renegotiated. The debtor is free to prepay his debts in the event that his assets appreciate or that he receives additional income

from an unexpected source, say in the form of inheritance. The debtor can also potentially convert the case into a Chapter 7 bankruptcy, even after confirmation of the Chapter 13 plan, or voluntarily default on the confirmed plan and have the case dismissed. When a debtor benefits from a substantial increase in income after confirmation of a repayment plan, from inheritance say, the trustee will attempt to force the debtor into increasing his payments accordingly. Ultimately, the final plan that gets carried out can look very different from the first proposed plan or even the first confirmed plan.

Figure 1 summarizes the time line of Chapter 13 bankruptcy procedure. The payment shocks here refer to unexpected changes to debtors' income or assets as discussed earlier. There potentially exists multiple payment shocks, and thus multiple possible modification of the plan. However, since our data does not allow us to observe these events directly, we reduce them to one single payment shock. Finally, a debtor potentially exits the bankruptcy court via dismissal before confirmation, dismissal after confirmation, voluntary dismissal after confirmation, or discharge as highlighed in red in the figure. Note that discharge can only occur after the plan is carried out.

# 3 The Model

In this section, we model debtors' behavior during their Chapter 13 bankruptcy procedure taking as given trustees' decision rules. We do not explicitly model creditors here since creditors do not actively participate in Chapter 13 bankruptcy and their influence is captured by trustees' decisions as discussed in the last section.

Our analysis begins when a debtor files for bankruptcy under Chapter 13. In order that his debts be discharged, the debtor must propose a repayment plan, have it confirmed by the court, and carry it out in full. In the event that the debtor does not obtain a discharge, his case is either converted to a Chapter 7 filing or dismissed. In the latter case, state collection laws apply.

A debtor's utility depends on whether his debts are ultimately discharged, as well as on the amount of payments made under Chapter 13. We normalize the utility obtained from resorting to options outside of Chapter 13, including informal default or conversion to Chapter 7, to zero. The utility derived from successfully obtaining a discharge, when payments $P$ are made under a confirmed plan, is given by $u_D - P$.[2]

Since the law requires that all of a debtor's excess income, denoted $X$, be applied to

[2]Debtors who initially file under Chapter 13 and later pay off their debts outside bankruptcy also receive utility $u_D - P$. Because debtors rarely exit bankruptcy while repaying creditors in full, this assumption is without any real emprical consequence.

the repayment plan, debtors have little say over per period plan payments and these are treated as exogenous. Their decision then effectively reduces to choosing between different plan lengths in years, $\widetilde{L}$. We assume that plan lengths take either the value three or five, $\widetilde{L} \in \{3, 5\}$. While this assumption is made for simplicity, it is consistent with the observed distribution of proposed plan lengths being highly bimodal around these two values. Hence, we shall refer to debtors as choosing either short-term plans or long-term plans. When debtors have arrears outstanding, the proposed plan length must satisfy a lower threshold, $\underline{L}$, that allows them to fulfill these obligations. Given that both a debtor's arrears and excess income are observable in our dataset, it is straightforward to compute $\underline{L}$. We define a plan length in excess of this threshold as $L \equiv \widetilde{L} - \underline{L}$.

Once a plan is proposed, a trustee must decide whether or not to require a wage order. The trustee must also decide whether or not to confirm the proposed plan. We let the dummy variable $W$ take the value one if a wage order is required, and zero otherwise. Similarly, the dummy variable $C$ takes the value one when a plan is confirmed and zero otherwise. The trustee's decisions with respect to requiring a wage order and confirming a plan are made sequentially. In particular, the trustee first decides whether or not to require a wage order, and then makes a decision regarding the proposed plan.[3] From the debtor's standpoint, these decisions are exogenous. We let $P(C, W|L) = P(C|W, L)P(W|L)$ denote the joint probability over the trustee's wage order and confirmation decisions, conditional on the debtor choosing a plan with excess length $L$. We focus on excess plan length, $L$, rather than plan choice, $\widetilde{L}$, as a conditioning variable because excess plan is more tightly connected to unsecured debt.

In practice, a debtor's excess income will be subject to variations within the plan because of changes in the debtor's circumstances. For example, even after a plan is confirmed, a debtor may switch employment, gain additional income in the form of inheritance, or obtain access to refinancing on secured debt, and these changes are observed by the trustee.[4] We model this variation in excess income as a proportional shock, $\eta \in H = [0, \infty)$. Therefore, when per period payments $X\eta$ are made within a plan of length $\widetilde{L}$, total plan payments are given by $\widetilde{L}X\eta$.

Note that even if a Chapter 13 plan is initially confirmed by the trustee, this plan may nonetheless be dismissed at a later date once the shock $\eta$ is realized. As an example, consider

[3] The wage order requirement is meant to militate against the possibility that debtors linger in bankruptcy without a confirmed plan and, therefore, take advantage of the many provisions that exist under the current bankruptcy code.

[4] The trustee reviews debtors' W-2 forms annually. Changes in debtors' asset positions, however, are more difficult to monitor except in cases where a substantial appreciation has occurred.

the case where a debtor's income unexpectedly rises while under Chapter 13. The law specifically requires that this increase in income be reflected in payments made under the existing plan.[5] Therefore, any attempt to keep payments unchanged by the debtor, say by arguing for a raise in maintenance expenses, may well result in a dismissal of the case depending on the trustee's view of the argument. We denote the probability that a case is dismissed, given the particular realization of a shock $\eta$, by $\theta(\eta|C, W, L)$. In other words, given the debtor's status as described by $\{C, W, L\}$, the probability of a plan being dismissed by the trustee after initial confirmation depends strictly on the realization of $\eta$.

Let $B$ represent the amount owed to creditors at the time of default by a representative debtor in our sample. Then, because total payments made under Chapter 13 never exceed the amount owed, we have that $P = \min\{\widetilde{L}X\eta, B\}$. If $u_D - \min\{\widetilde{L}X\eta, B\} < 0$ upon the realization of the shock $\eta$, staying with the plan is not optimal from the debtor's standpoint. Recall that the utility obtained from resorting to options outside of Chapter 13 is normalized to zero. In that case, he will simply opt out of Chapter 13 and stop making payments (the trustee returns payments already made). In contrast, if $u_D - \min\{\widetilde{L}X\eta, B\} \geq 0$, the debtor stays with Chapter 13 and makes payments in the amount of $\min\{\widetilde{L}X\eta, B\}$.

We assume that shocks to excess income while under Chapter 13 are governed by the gamma density function, $F(\eta|C, W, L)$. These shocks are realized after the trustee's decisions regarding wage order and plan confirmation, and may be correlated with debtors' status at that stage, $\{C, W, L\}$. A debtor's expected utility, $v(\widetilde{L})$, is given by

$$v(\widetilde{L}) = u(\widetilde{L}) + \varepsilon_{\widetilde{L}}, \tag{1}$$

where $\varepsilon_{\widetilde{L}}$ denotes an approximation error associated with aspects of proposed plan lengths that are not captured by our framework. Some debtors, for instance, may believe that proposing a longer plan can allow them access to credit at better terms after bankruptcy. Given the environment we have just described, we have that

$$\begin{aligned} u(\widetilde{L}) \;\; = \;\; & \int_H P(W|L)P(C|W, L)F(\eta|C, W, L) \\ & [1 - \theta(\eta|C, W, L)] \max[0, u_D - \min\{\widetilde{L}X\eta, B\}]d\eta. \end{aligned} \tag{2}$$

In the event that $\eta$ is independent of all other information, equation (2) can be re-written as

$$u(\widetilde{L}) = P(W|L)P(C|W, L)E_\eta \Big\{ [1 - \theta(\eta|C, W, L)] \max[0, u_D - \min\{\widetilde{L}X\eta, B\}] \Big\} \tag{3}$$

The debtor's problem is then to choose $\widetilde{L}$ so as to maximize (1).

[5] See Li and Sarte (2006) for a discussion of this contingency.

Following McFadden (1993), and Rust (1997), we assume that $\varepsilon_3$ and $\varepsilon_5$ are independently and identically distributed according to a type 1 extreme value distribution with standard deviation $\rho$. Under these assumptions, the solution to the debtor's problem is

$$P(\widetilde{L}) = \frac{e^{u(\widetilde{L})/\rho}}{\sum_{L=3,5} e^{u(\widetilde{L})/\rho}}, \tag{4}$$

where $\widetilde{L}$ is a binary variable that takes the value 3 to denote a short term plan, and 5 for a long-term plan.

From the position of the debtor, the trustee's wage oder, confirmation decision of the first proposed plan, and dismissal decision after the realization of the payment shock, while conditional on the particular plan proposed and information available to that point, are random and partly reflects the trustee's type. We assume that

$$P(W = 1|L) = \frac{\exp(\alpha_W L)}{1 + \exp(\alpha_W L)}, \tag{5}$$

$$P(C = 1|W, L) = \frac{\exp(\alpha_C L + \gamma_C W)}{1 + \exp(\alpha_C L + \gamma_C W)}, \tag{6}$$

and that

$$\theta(\eta|C, W, L) = \frac{\exp(\alpha_\eta L + \gamma_\eta W + \beta_\eta C)}{1 + \exp(\alpha_\eta L + \gamma_\eta W + \beta_\eta C)} \tag{7}$$

where $\alpha_i$, $i = W, C, L$, $\gamma_C$ and $\beta_L$ are parameters to be estimated. To address the empirical implementation more specifically, we now discuss the mechanics of Chapter 13 in more detail.

Should the trustee decide to dismiss a proposed plan at any stage, the debtor's case is terminated without a discharge. Whether or not a case is terminated is captured by the dummy variable $T$, where $T = 1$ when a case is closed and $T = 0$ otherwise. The dummy variable $D$ takes on the value one when the debtor obtains a discharge and zero otherwise. When a proposed plan is never confirmed, creditors do not collect anything under Chapter 13. The recovery rate under that chapter, $R \in [0, 1]$, is then zero.

Because payments made by the debtor under Chapter 13 are given by $P = \min\{\widetilde{L}X\eta, B\}$, let us now consider the implications of each of the scenarios, $\widetilde{L}X\eta \geq B$ and $\widetilde{L}X\eta < B$. First suppose that the amount owed at default is such that $\widetilde{L}X\eta \geq B$. If it is also the case that $u_D - B \geq 0$ (where $u_D$ is a parameter to be estimated), $u_D \geq \min\{\widetilde{L}X\eta, B\}$ and the debtor simply pays his debts in full under Chapter 13 thus obtaining a discharge. For such a debtor in our sample, $T \in \{0, 1\}$ depending on whether the case is already closed, $D = 1$, and creditors fully recover their loans, $R = 1$. If $u_D - B < 0$ instead, the debtor opts out of Chapter 13 so that the case is immediately terminated, $T = 1$, without his obtaining a discharge, $D = 0$, or creditors recovering anything under that Chapter, $R = 0$. Next,

consider the opposite case, $\widetilde{L}X\eta < B$. As before, if $u_D - \widetilde{L}X\eta \geq 0$, the debtor stays with the plan and eventually obtains a discharge, $D = 1$, although creditors are unable to fully recover their loans in this case, $R = \frac{\widetilde{L}X\eta}{B} < 1$. In contrast, if $u_D - \widetilde{L}X\eta < 0$ after the shock $\eta$ is realized, the debtor simply abandons the plan so that $T = 1$, $D = 0$ and $R = 0$.

For each debtor, our model generates endogenous variables $L$, $W$, $C$, $T$, $D$, and $R$, as well as the latent variable $\eta$. Our dataset allows us to observe $L$, $W$, $C$, and $T$ for all debtors. In addition, we observe $D$ and $R$ for debtors whose cases are closed, $T = 1$. For debtors whose case are still open, $T = 0$, we do not yet know their discharge status nor creditors' ultimate recovery rate. Therefore, the econometric specification to which we now turn our attention explicitly accounts for this distinction between open and closed cases.

The likelihood function we seek to maximize is given by

$$\mathcal{L} = \mathcal{L}_0 \cdot \mathcal{L}_1 \tag{8}$$

where $\mathcal{L}_0$ is the likelihood relevant for open cases,

$$\mathcal{L}_0 = \Pi_{i=i}^{N} P(L_i, W_i C_i, T_i = 0;\, \eta_i)$$

and $\mathcal{L}_1$ is that which applies to terminated cases,

$$\mathcal{L}_1 = \Pi_{i=1}^{N} P(L_i, W_i, C_i, T_i = 1, D_i, R_i;\, \eta_i).$$

The variable $N$ refers to the number of debtors in our dataset, and $P(.)$ denotes the joint probability distribution over its arguments. More specifically,we have that

$$\mathcal{L}_0 = \Pi_{i=1}^{N} P(L_i) P(W_i|L_i) P(C_i|W_i, L_i) \int_H F(\eta_i|C_i, W_i, L_i) P(T_i = 0|\eta_i, C_i, W_i, L_i) d\eta_i, \tag{9}$$

where expressions for $P(L_i)$, $P(W_i|L_i)$, and $P(C_i|W_i, L_i)$ are given by equations (4) through (6) above, and we integrate over all possible values of the shock $\eta$ since it is a latent variable. Similarly,

$$\begin{aligned} \mathcal{L}_1 \;=\; & \Pi_{i=1}^{N} P(L_i) P(W_i|L_i) P(C_i|W_i, L_i) \int_H F(\eta_i|C_i, W_i, L_i) P\left(T_i = 1|\eta_i, C_i, W_i, L_i\right) \\ & P\left(D_i|T_i = 1, \eta_i, C_i, W_i, L_i\right) P\left(R_i|D_i, T_i = 1, \eta_i, C_i, W_i, L_i\right) d\eta_i. \end{aligned} \tag{10}$$

At this point, it remains to derive expressions for $\int_H F(\eta_i|C_i, W_i, L_i) P(T_i = 0|\eta_i, C_i, W_i, L_i) d\eta_i$ for cases that are still open, and $\int_H F(\eta_i|C_i, W_i, L_i) P(T_i = 1|\eta_i, C_i, W_i, L_i) P(D_i|T_i = 1, \eta_i, C_i, W_i, L_i) P(R_i|D_i, T_i = 1|\eta_i, C_i, W_i, L_i) d\eta_i$ for terminated cases. Put another way, conditional on the plan length chosen by the debtor, determined according to (4), as well as wage order and confirmation decisions by the trustee, governed by (5) and (6) respectively, we need to

address what factors determine whether observed cases are open or closed and, conditional on the case termination status, the resulting discharge and recovery rate outcomes.

Consider first the likelihood function for open cases, $\mathcal{L}_0$, and define

$$\Phi_0 = \int_H F(\eta_i|C_i, W_i, L_i) P(T_i = 0|\eta_i, C_i, W_i, L_i) d\eta_i. \tag{11}$$

We assume that any significant change in a debtor's excess income, $\eta_i$, occurs strictly prior to the last year of the existing plan. Since cases that are still open in our dataset are at most 6 months from completion, this amounts to assuming that those cases will be carried out successfully or, alternatively, that for those cases, $u_{iD} - \widetilde{L}_i X_i \eta_i \geq 0$. Because the maximum length to completion is so short for cases that remain open, this assumption is unlikely to be violated as these cases terminate.

Note that a Chapter 13 case in our dataset cannot be observed to be open if it was never confirmed. Hence, $P(T_i = 0|\eta_i, C_i, W_i, L_i) = 0$ whenever $C_i = 0$. Next, we examine cases that are initially confirmed.

As explained above, following the initial confirmation of a case, $C_i = 1$, if variations in the debtor's excess income, $\eta_i$, and the amount owed at default, $B_i$, are such that $u_{iD} < B_i$ and $B_i < \widetilde{L}_i X_i \eta_i$, then the debtor will simply exit Chapter 13. This will immediately terminate the case and $P(T_i = 0|\eta_i, C_i, W_i, L_i) = 0$. In contrast, if $u_{iD} < B_i$ and $B_i \geq \widetilde{L}_i X_i \eta_i$, the case lives on with probability $1 - \theta(\eta_i|C_i, W_i, L_i)$, in which case the debtor makes payments in the amount $\widetilde{L}_i X_i \eta_i$ over the life of the plan. Therefore, we have that

$$\Phi_0 = \begin{cases} \int_0^{B_i/\widetilde{L}_i X_i} [1 - \theta(\eta_i|C_i, W_i, L_i)] F(\eta_i|C_i, W_i, L_i) d\eta & \text{when } u_{iD} < B_i \text{ and } C_i = 1 \\ 0 & \text{otherwise} \end{cases}$$

in equation (9).

When the amount owed at default is such that $u_{iD} \geq B_i$, then $u_{iD} \geq \min\{\widetilde{L}_i X_i \eta_i, B_i\}$ since we have assumed that cases still open are successfully completed unless explicitly terminated by the trustee. In that case,

$$\Phi_0 = \begin{cases} \int_H [1 - \theta(\eta_i|C_i, W_i, L_i)] F(\eta_i|C_i, W_i, L_i) d\eta_i & \text{when } u_{iD} \geq B_i \text{ and } C_i = 1 \\ 0 & \text{otherwise} \end{cases}.$$

This completes the specification of the likelihood $\mathcal{L}_0$.

We now examine the expression that is being integrated in the likelihood function, $\mathcal{L}_1$, defined in equation (10). Let

$$\begin{aligned} \Phi_1 \;=\; & \int_H F\left(\eta_i|C_i, W_i, L_i\right) P\left(T_i = 1|\eta_i, C_i, W_i, L_i\right) \\ & P\left(D_i|T_i = 1, \eta_i, C_i,\ W_i, L_i\right) P\left(R_i|D_i, T_i = 1, \eta_i, C_i, W_i, L_i\right) d\eta_i \end{aligned}$$

As always, when a case is never confirmed, $C_i = 0$, it it necessarily terminated, $T_i = 1$, without the debtor ever obtaining a discharge, $D_i = 0$, or creditors being repaid, $R_i = 0$. Hence, when $C_i = 0$,

$$\Phi_1 = \begin{cases} 1 & \text{if } T_i = 1,\ D_i = 0 \text{ and } R_i = 0 \\ 0 & \text{otherwise} \end{cases}.$$

We now turn to cases that are initially confirmed.

As before, two cases must be considered with respect to the amount of debt owed at filing, $u_{iD} \geq B_i$ and $u_{iD} < B_i$. Suppose first that a confirmed case is such that $u_{iD} < B_i$. Then, even if the trustee does not later dismiss the case, which occurs with probability $1 - \theta(\eta_i|C_i, W_i, L_i)$, but the realized shock, $\eta_i$, is such that $\widetilde{L}_i X_i \eta_i > u_{iD}$, the debtor exits Chapter 13. In this case, $R_i = D_i = 0$. If instead $\widetilde{L}_i X_i \eta_i \leq u_{iD}$, the debtor carries on with the plan and repays $\widetilde{L}_i X_i \eta_i$, so that the recovery rate for creditors is given by $R_i = \frac{\widetilde{L}_i X_i \eta_i}{B_i}$. Hence, for the likelihood function, $\mathcal{L}_1$, defined in equation (10) with $C_i = 1$, we have that when $u_{iD} < B_i$,

$$\Phi_1 = \begin{cases} F\left(\frac{B_i R_i}{\widetilde{L}_i X_i}|C_i, W_i, L_i\right)\left[1 - \theta\left(\frac{B_i R_i}{\widetilde{L}_i X_i}|C_i, W_i, L_i\right)\right] & \text{if } R_i > 0 \text{ and } D_i \neq 0 \\ \int_H F(\eta_i|C_i, W_i, L_i)\theta(\eta_i|C_i, W_i, L_i)d\eta_i & \\ + \int_{u_{iD}/\widetilde{L}_i X_i}^{\infty} F(\eta_i|C_i, W_i, L_i)[1 - \theta(\eta_i|C_i, W_i, L_i)]d\eta_i & \text{if } R_i = 0, \end{cases}.$$

The first term in the event that $R_i = 0$ is observed captures cases that are terminated by the trustee after the shock, $\eta_i$, is realized. For example, when a debtor loses his job, the trustee will typically have to dismiss the case because payments set under the confirmed plan can no longer be met and modifications are not feasible.[6] The second term in the expression related to $R_i = 0$ depicts debtors whose cases are not dismissed after $\eta_i$ is realized, but whose change in excess income was so large that they opt out of Chapter 13. Such a scenario arises, for instance, when a debtor receives an inheritance and decides to pay off creditors in full to avoid any stigma from bankruptcy. The oberserved bankruptcy repayment rate, $R_i$, however, remains zero.[7]

Finally, we consider the case $u_{iD} \geq B_i$ as it applies to the likelihood function $\mathcal{L}_1$. Note that debtors for whom this case is relevant never have an incentive to walk away from Chapter 13. Therefore, in this case, the only way in which the outcome $R_i = 0$ is observed occurs when the trustee dismisses the case after observing $\eta_i$. Hence, we have that

[6] On rare occassions, the debtor can obtain a hardship discharge if the following three conditions are met. First, failure to complete the payments is due to circumstances beyond the debtor's control such as medical problems. Second, unsecured creditors have received under the plan at least the amount they would have received under Chapter 7. Finally, modification of the plan is not practical.

[7] As mentioned, this scenario is for the completion of the model. It does not have any empirical significance.

$$\Phi_1 = \begin{cases} F(\eta_i|C_i, W_i, L_i)\theta(\eta_i|C_i, W_i, L_i) & \text{if } R_i = 0 \\ \int_{B_i/\widetilde{L}_i X_i}^{\infty} F(\eta_i|C_i, W_i, L_i)[1 - \theta(\eta_i|C_i, W_i, L_i)]d\eta & \text{if } R_i = 1 \\ \int_{0}^{B_i/\widetilde{L}_i X_i} F\left(\eta_i|C_i, W_i, L_i\right)\left[1 - \theta\left(\eta_i|C_i, W_i, L_i\right)\right] & \text{if } R_i \in (0,1) \end{cases} .$$

This completes the specification of the likelihood, $\mathcal{L}_1$.

Before concluding this section, it is worth noting that in order to economize on notation, we have omitted debtors' other characteristics, such as those related to income statement and balance sheet information, as well as prior bankruptcy history, throughout our discussion. These factors, which we summarize as a vector of exogenous state variables, $Z_i$, can significantly affect both the trustee's and debtors' decisions. Hence, we include this information as conditioning variables in the empirical implementation.

# 4 The Data

## 4.1 Data Collection

The data collected in this paper is obtained using an electronic public access service to case and docket information from Federal Appellate District and Bankruptcy courts, and the U.S. Party/Case Index. This service is commonly known as Public Access to Court Electronic Records (PACER) and offers bankruptcy court information including: i) a listing of all parties and participants including judges, attorneys, and trustees, ii) a chronology of the dates of case events entered in the case record, iii) a claims registry, and iv) the types of documents filed for specific cases and imaged copies of these documents.

According to court documents and discussions with court legal staff, as of August 2005, the onset of this research project, 62 of the 94 U.S. bankruptcy courts required mandatory online filing.[8] We focus on the Delaware bankruptcy court in our study because Chapter 13 plans can last as long as 5 years, and Delaware was one of the very first states to start mandatory online filing. Furthermore, we consider all Chapter 13 cases filed between August 2001 and August 2002 anticipating that the large majority of these cases will be closed as of the writing of this paper.

There were 1084 Chapter 13 bankruptcy cases filed in Delaware over our sample period. Of the 1084 cases, 65 were later converted to Chapter 7. We delete from our sample cases that have incomplete information, resulting from either court recording or filing error, and

[8] Information on Puerto Rico and the Virgin Islands is not available.

that are therefore trivially dismissed.[9] Our final sample contains 965 cases, 61 of which were later converted to Chapter 7 filings. Of the 965 cases, 817, or 85 percent of the cases, were closed as of February 5, 2007. Table 1 summarizes the status of the cases under consideration.

## 4.2 Data Description

### 4.2.1 Who uses Chapter 13?

The court files provide information on debtors' income statement and balance sheet, their demographics, and their employment status. We present summary statistics related to this information in Table 2. For comparison, we also report information on the state of Delaware when available and the nation otherwise. In particular, demographics, employment status, and income information is obtained for the State of Delaware from the 2000 Census and Mortgage Bankers Association. Balance sheet information is obtained from the 2001 Survey of Consumer of Finances at the national level.

Table 2 indicates that, compared to their peers, Chapter 13 filers in our sample are less likely to be married but have a slightly larger family. Over 80 percent of debtors own their homes, which noticeably exceeds the 70 percent state home ownership rate. That said, about one-fifth of homeowners who file for bankruptcy have pending foreclosure lawsuits, substantially higher than the state average foreclosure rate. Moreover, over 20 percent of filers in our sample had previously filed for either Chapter 7 or 13 and, therefore, had already been exposed to the experience of bankruptcy.

Regarding employment, filers in our sample are more likely to hold steady jobs, though their monthly income falls short of Delaware's average adjusted gross income by approximately 30 percent. Furthermore, though not reported in the table, filers experience a 20 percent decline in income on average relative to the year prior to their filing. As expected, the most striking aspect of Chapter 13 filers relates to their level of indebtedness. Specifically, their total debt is about 3 times of the national average, and their unsecured debt is over 15 times of the national average. The numbers are even more striking when we compared them to income.

To sum up, Chapter 13 filers do not appear to make up the most destitute part of the general population with respect to assets. However, they do tend to earn noticeably less than average and are very heavily indebted. These observations are not inconsistent with previous findings in literature.[10]

[9] Of the deleted observations, we cannot find information on only two cases from PACER regarding their final outcome owing to court recording error.

[10] Domowitz and Sartain (1999), Nelson (1999), as well as Fay, Hurst, and White (2002), argue that debt

### 4.2.2 Chapter 13 in Action

**The Proposed Plans** All filers need to have a proposed plan in their petition when filing for bankruptcy. The plan must detail the amount of payments, payment length, and the distribution of payments to various creditors, secured and unsecured.[11] The plan must also state whether the debtor intends to obtain additional cash, such as that obtained from mortgage refinancing or the selling of a property, to help cover unmet claims and, if so, within what specific time frame. When resources in addition to income are brought to bear for the payment of debts, the length of the plan proposed can be shorter than 3 years. Secured debt refers to arrearage on secured loans, such as mortgage or car loans, and regular installments on secured debt are almost always made outside a bankruptcy plan.[12] Because the law requires debtors to devote all of their disposable income – income net of reasonable maintenance expenses – to the payment plan, and because secured creditors have to be paid in full, key elements of a repayment plan ultimately include the proposed plan length, whether additional resources are available, and the resulting payment ratio to unsecured nonpriority creditors.

We present the main facets of plans first proposed by our debtors in the top panel of Table 3. The average length of a Chapter 13 repayment plan is 4 and a half years, close to the five-year upper bound allowed under the law, and over 50 percent of our debtors initially propose a five-year plan. This is not surprising given that for the majority of the debtors, it takes at least 3 years to make up the arrears on secured debt. Between 2 and 4 percent of the debtors in our sample intend to obtain additional resources in the form of mortgage refinancing and the selling of a car.[13] Finally, debtors initially propose to pay 22 percent of their unsecured debt on average. However, the median proposed pay ratio for unsecured debt is considerably lower at only 7 percent.

**The Confirmed Plans** In the second panel of Table 3, we present various characteristics of first confirmed plans. The information presented in Table 3 is analogous to that presented

is a key factor in households' bankruptcy decision. Additionally, high asset households and households with regular income are much more likely to file under Chapter 13.

[11] Unsecured loans are divided into unsecured priority loans and unsecured nonpriority loans. The former include taxes, alimony, and student loans, and must be paid in full. The latter include all personal loans and credit card debt. Unsecured priority loans make up a small part of total household debt. Throughout the paper, unless specified, unsecured debt refers to unsecured priority loans.

[12] The reason is that a trustee often charges up to 10 percent of each payment made within the bankruptcy plan.

[13] The trustee for all cases in our dataset indicated that this observation was likely to be related to the strong housing market in 2000 and 2001.

for proposed plans.

Relative to first-proposed plans, the monthly payment associated with a confirmed plan increases by $36 on average, and by $35 for the median debtor. The percentage of debtors who plan to retrieve additional resources from their assets more than doubles. The promised ratio of payments to debt for unsecured creditors is also slightly higher under the confirmed plans.

### 4.2.3 Measuring the Performance of Chapter 13 – the Outcomes

In principle, any bankruptcy system aims to achieve two goals that are, to some degree, in conflict: maximizing the return to creditors and providing debtors with a financial fresh start by having their debts discharged. The law does not specify how these goals should be balanced.[14] That said, even without a precise way of evaluating the success or failure of Chapter 13, we can make headway by thinking about what might constitute desirable features of a bankruptcy procedure. We propose the following benchmark guidelines: i) recovery rates for unsecured creditors should match or exceed those obtained under other solutions to borrower default,[15] and ii) all confirmed cases should eventually be discharged. Given these criteria, we construct the following four performance measures:

**The recovery rate:** This measure captures payments received by various creditors relative to the face value of unpaid claims under Chapter 13. Recovery rates are zero for cases that are dismissed without confirmation.[16]

**The discharge rate:** The percentage of cases that exit the court after a discharge is obtained under Chapter 13.

**The rate of dismissal without confirmation:** The percentage of cases that are never confirmed. The term "dismissal" is used somewhat loosely in this context since a subset of the cases that are converted to Chapter 7 may eventually be discharged under that chapter. However, given the small number of Chapter 7 conversions at this stage, we do not formally distinguish between dismissal and chapter conversion in our analysis.

[14] One can imagine a welfare crieterion where the objectives of both creditors and debtors are taken into account. There currently exists little guidance, however, on how to specify the welfare weights.

[15] From the creditors' standpoint, a higher recovery rate for unsecured debt is indeed the primary advantage of Chapter 13 over other options, such legal options outside bankruptcy.

[16] In the analysis related to recovery rates, we sometimes drop observations associated with zero debt, total or unsecured, depending on the question at hand.

The rate of dismissal without confirmation captures bankruptcy outcomes in the first stage of the bankruptcy before the realization of payment shocks are shown in Figure 1.[17] The discharge rate summarizes outcomes in the final stage of the bankruptcy after the realization of payment shocks. Cases that are discharged are necessarily confirmed. The recovery rate matters directly to creditors and summarizes bankruptcy outcomes that can occur both before and after the realization of payment shocks as shown in Figure 1. The recovery rate and the discharge rate are reported for cases that have already terminated. As of February 5, 2007, only 15 percent of the cases remain open.

Tables 4 and 5 present summary statistics for the three Chapter 13 performance measures we construct. Three main findings stand out. First, close to 20 percent of the filers in our sample are dismissed without ever obtaining the confirmation of a plan despite the fact all filers are voluntary filers. Second, conditional on being terminated, less than 40 percent of the plans are carried out to completion. Even if all cases that are still open eventually resulted in a debt discharge, the discharge rate would only be 55 percent. Third, currently closed cases indicate that secured creditors collect only 23 cents on every dollar they are owed. Unsecured creditors receive only 17 cents on the dollar. Most strikingly, over half of both secured and unsecured creditors collect nothing in Chapter 13. For creditors as a whole, the average recovery rate is 28 percent with a median of 13 percent.

All in all, our Chapter 13 performance measures paint a rather grim picture of Chapter 13 as a collection mechanism for creditors and as a means of providing debtors with a financial fresh start. A natural question, for both academics and policys makers, is: what debtor characteristics or other factors are associated with these rather poor outcomes? We turn to this question in the next section.

# 5 Results

## 5.1 Estimation Results

In our empirical estimation, for simplification, we set debtors' utility after discharge, $u_D$, to be the same as total amount of debt $B$. This amounts to assuming that debtors' are risk neutral in terms of the amount of debt they carry. We include in debtors' exogenous characteristics, $Z$, the following variables: attorney experience, job tenure, whether debtors

[17] Trustees typically ask Chapter 13 filers to start submitting periodical payments according to the plan as soon as the plan is filed. Of course, payment are distributed only if the plan is confirmed and are otherwise refunded. This practice, together with other court rules, discourages debtors from staying in Chapter 13 bankruptcy without a confirmed plan for too long.

have any pending lawsuit, whether debtors have filed for bankruptcy before, the ratio of total debt to total asset, the ratio of unsecured debt to total debt, debtors' self-employment status, and debtors' household size. We also make the simplifying assumption that the payment shock is independent of debtors' other characteristics.

Attorney experience is constructed using the number of cases the attorney represented within the year. In particular, we set attorney experience to 1 if the attorney represented more than 25 cases for the sample, and 0 otherwise. Attorney experience is also set to 0 if the debtor represented himself. As mentioned in the data section, unsecured debt includes unsecured priority debt and unsecured nonpriority debt. Total debt refers to total unsecured debt plus arrears on secured debt, but not secured debt itself. The ratio of total debt to asset captures debtors' financial burden. The ratio of unsecured debt to total debt captures the percentage of debt that can be discharged within bankruptcy.

Tables 6 and 7 report our maximum likelihood estimation results. We discuss those related to the trustee's decisions first. In terms of wage order, attorney experience and job tenure both increases the probability of debtors' receiving wage orders. Experienced attorneys understand that having a wage order helps with obtaining confirmation. Job tenure serves as a good proxy for income stability, which is important for the enforcement of wage orders. By contrast, self-employed are less likely to receive wage orders, reflecting, perhaps, fluctuating income commonly associated with small businesses. Interestingly, family size also has a positive effect on the debtors' probability of receiving wage orders. This could arise for a number of reasons. For example, debtors with large family sizes are more likely to be employed.

Concerning the first confirmation decision, or confirmation before the realization of payment shocks, a long proposed excess plan length, a wage order, attorney experience, as well as the percent of debt that is eligible for discharge all increase the probability of confirmation. A long proposed excess plan length may signal debtors' good faith in repaying as much debt as they can. Wage order serves as a good enforcement of the repayment plan. An experienced attorney obviously helps the case in all dimensions. Having a large fraction of debt as unsecured means that debtors' repayment obligation under bankruptcy is relatively small and thus, everything else the same, the plan is more likely to succeed.

Regarding the trustee's dismissal decision after the realization of the payment shock, a good payment shock obviously makes dismissal less likely. Consistent with the first confirmation decision before payment shock, a longer proposed excess plan length as well as having wage order reduces the probability of dismissal. By contrast, pending lawsuit and have a large fraction of debt unsecured increases the probability of dismissal after confirmation.

Debtors take into account the impact of his characteristics on the trustee's decisions

while proposing their initial plan and making the decision of whether to stay with the plan or not after receiving the payment shock. In particular, they have to weight the pros and cos of proposing a longer plan. On the one hand, a longer plan, especially if it is longer than required plan length, is helpful in terms of getting confirmed both before and after the payment shock. One the other hand, a longer plan implies that debtors have to pay more and, thus, reduces the utility after discharge.

In addition to the parameters pertinent to the trustee as well as debtors' decisions, it is worth noting that payment shocks are important in accounting for the performance of Chapter 13 outcomes. Finally, though unobserved factors (measurement errors as in the context of this paper) are statistically important in explaining debtors' payment plan decisions, they are not quantitatively and, thus, economically important.

# 6 Conclusion

Chapter 13 bankruptcy plays a central role in the recently passed 2005 Bankruptcy Abuse Prevention and Consumer Protection Act. To understand the actual performance of Chapter 13 bankruptcies, we collected a unique and novel dataset using court files between August 2001 and August 2002 in the state of Delaware. We have three main findings: for a median creditor, secured or unsecured, the recovery rate is zero; close to half of the cases fail with roughly 20 percent of them failing without even obtaining a court confirmation on their proposed plans.

To account for these observations, we build a theoretical model of consumer bankruptcy under Chapter 13. In the model, debtors make decisions regarding what plans to propose and whether to stay in Chapter 13 or not after receiving shocks to their payment ability, taking as given the trustee's decision. Structural estimations of the model suggests that households weight the costs and benefits of a longer versus short plan in their proposal. On the one hand, a long plan is costly in that debtors have to repay more under the plan. On the other hand, the trustee is more likely to confirm and subsequently discharge a long payment plan. We also find that wage orders play important roles in the ultimate success of a Chapter 13 case. Finally, our estimation also suggests that there exists substantial uncertainty concerning debtors payment ability that explain the failure of many Chapter 13 cases.

Despite its richness, the data we constructed and thus the subsequent study do have several limitations. First, we do not analyze debtors' bankruptcy Chapter choice decision and thus the effect of the reform act on the extensive margin of bankruptcy filing. Second, our data is not representative of the nation, potentially making the generalization of our

findings difficult.

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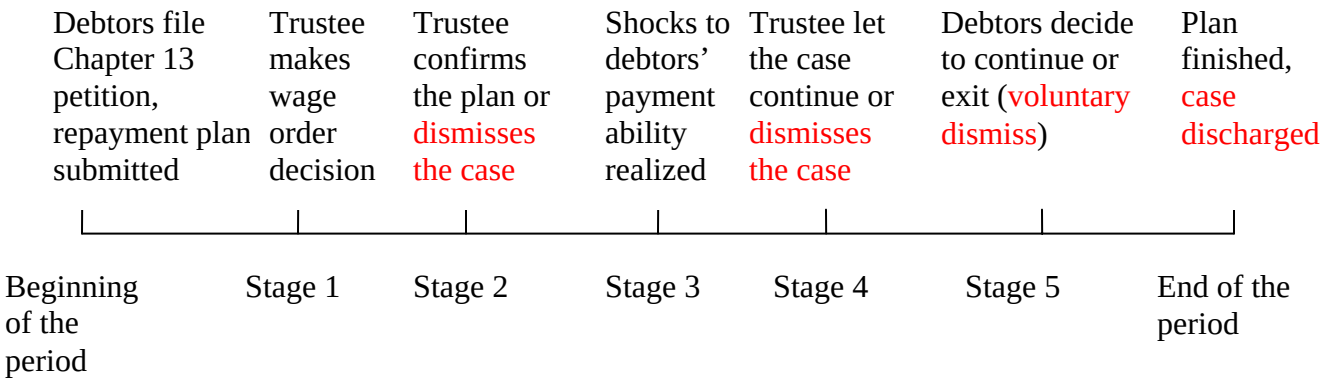


Figure 1. Chapter 13 Bankruptcy Timeline

**Table 1**
**A Sample Docket Sheet**

| Filed Date | # | Docket Text |
|---|---|---|
| 08/03/2001 | 1 | Chapter 13 Voluntary Petition. (Receipt Number 054242 voided 8/3/01 due to wrong amount. New receipt needed MLT).New receipt number 054430 issued 8/10/01 (DMS) Filed by Tiffany Poole on behalf of Ronald A. Thomas . (CFD, ) Modified on 8/3/2001 (mlt ). Modified on 8/8/2001 (Seningen, Donna). Modified on 8/10/2001 (DMS, ). (Entered: 08/03/2001) |
| 08/06/2001 | | Meeting of Creditors Scheduled for 9/5/01 @ 11:00am Court Room #10. Confirmation Hearing Scheduled for 9/24/01 @ 2:00pm Court Room #20. (Entered: 08/06/2001) |
| 08/20/2001 | 2 | Notice of Appearance and Request for Service Filed by Arcadia Financial Ltd. (JSJ, ) (Entered: 10/02/2001) |
| 09/12/2001 | | Meeting of Creditors. 341(a) meeting to be held on 11/6/2001 at 10:00 at US Bankruptcy Court, 824 Market St., Room 509, Wilmington, Delaware. Last day to oppose discharge or dischargeability is 1/5/2002. Proofs of Claims due by 2/5/2002. Government Proof of Claim due by 5/7/2002. Confirmation hearing to be held on 11/19/2001 at 02:00 PM (check with court for location).(JSJ, ) (Entered: 09/12/2001) |
| 09/28/2001 | | Meeting of Creditors. 341(a) meeting to be held on 11/6/2001 at 10:00 AM at US District Court, 844 King St., Room 2313, Wilmington, Delaware. Last day to oppose discharge or dischargeability is 1/5/2002. Proofs of Claims due by 12/28/2001.Government Proof of Claim due by 3/28/2002. Confirmation hearing to be held on 11/19/2001 at 10:00 AM at US Bankruptcy Court,824 Market St., Room 509, Wilmington, Delaware. (JSJ, ) Modified on 9/28/2001 (JSJ, ). ENTERED IN ERROR (Entered:09/28/2001) |
| 10/01/2001 | | Meeting of Creditors. 341(a) meeting to be held on 11/6/2001 at 10:00 AM at US District Court, 844 King St., Room 2313, Wilmington, Delaware. Last day to oppose discharge or dischargeability is 1/5/2002. Proofs of Claims due by 2/6/2002.Government Proof of Claim due by 2/5/2002. Confirmation hearing to be held on 11/19/2001 at 02:00 PM at US Bankruptcy Court,824 Market St., Room 509, Wilmington, Delaware. (JSJ, )(Entered:10/01/2001) |

**Table 2**
**A Sample Docket Sheet (continued)**

| Filed Date | # | Docket Text |
|---|---|---|
| 10/19/2001 | 5 | Meeting of Creditors. 341(a) meeting to be held on 11/6/2001 at 10:00 AM at US District Court, 844 King St., Room 2313, Wilmington, Delaware. Proofs of Claims due by 2/6/2002. Government Proof of Claim due by 2/5/2002. Confirmation hearing to be held on 11/19/2001 at 02:00 PM at US Bankruptcy Court, 824 Market St., Room 509, Wilmington, Delaware. (DSC, )Additional attachment(s) added on 11/21/2001 (MEL, ). (Entered:10/19/2001) |
| 10/22/2001 | 12 | Notice of Filing Notice of Chapter 13 Meeting of Creditors and Deadlines Filed by xxx. (MAS, ) (Entered:01/28/2002) |
| 11/06/2001 | 4 | Minute Sheet 341 Meeting Held. (DSC,)(Entered:11/13/2001) |
| 11/07/2001 | 11 | Objection to Confirmation of Plan Filed by Delaware Division of Revenue. (VLA, ) (Entered: 01/18/2002) |
| 11/13/2001 | 3 | Objection to Confirmation of Plan by the Internal Revenue Service to Chapter 13 Plan Filed by xxx (Slights, Ellen) (Entered: 11/13/2001) |
| 11/13/2001 | 8 | Motion for Relief from Stay. Receipt Number 056247, Fee Amount $75. Filed by Wells Fargo Home Mortage,Inc.. Hearing scheduled for 12/18/2001 at 09:30 AM at US Bankruptcy Court, 824 Market St., 6th Fl., Courtroom #1, Wilmington, Delaware. Objections due by 12/10/2001. (JSJ, ) Notice of Motion Certificate of Service (Entered: 12/05/2001) |
| 11/19/2001 | 6 | Confirmation Hearing Held. (GVW, ) Modified on 11/30/2001 (GVW, ). ENTERED IN ERROR (Entered: 11/30/2001) |
| 11/19/2001 | 7 | Hearing Continued for 1/28/2002 at 02:00 AM at US Bankruptcy Court, 824 Market St., Room 509, Wilmington, Delaware. (GVW, ) Additional attachment(s) added on 12/3/2001 (TAS, ). Additional attachment(s) added on 12/14/2001 (MEL, ).(Entered:11/30/2001) |

**Table 3**
**A Sample Docket Sheet (continued)**

| Filed Date | # | Docket Text |
|---|---|---|
| 11/19/2001 | 10 | Order of Court Regarding Certain Provisions.(GVW, ) Additional attachment(s)added on 12/14/2001 (KLM, ). (Entered:11/30/2001) |
| 12/10/2001 | 9 | Response to Motion for Relief from Stay (RE: Doc. #8) Filed by xxx. (JSJ, ) Notice of Service (Entered:12/11/2001) |
| 12/17/2001 | 16 | Notice of Transfer of Claim #2 (Wells Fargo Home Mortgage Filed by Wells Fargo Home Mortage, Inc.. (JSJ, )(Entered:02/21/2002) |
| 12/28/2001 | 17 | Amended Plan Filed by Ronald A. Thomas. (JSJ, ) (Entered: 02/21/2002) |
| 01/28/2002 | 13 | Hearing Continued for 2/25/2002 at 02:00 PM at US Bankruptcy Court, 824 Market St., Room 509, Wilmington, Delaware. (GVW, ) Additional attachment(s) added on 1/29/2002(BAM, ). (Entered: 01/28/2002) |
| 01/29/2002 | 14 | Hearing Held (related document 8). Order Entered (REB)(Entered:1/30/2002) |
| 01/29/2002 | 15 | Order signed on 1/29/2002 (related document 8). (REB) (Entered:2/01/2002) |
| 02/25/2002 | 18 | Hearing Held. CASE DISMISSED (MAS, ) Additional attachment(s) added on 3/6/2002 (MAS, ). (Entered:03/04/2002) |
| 02/25/2002 | 19 | Order of Court Regarding Certain Provisions.(MAS, ) Additional attachment(s) added on 3/19/2002 (MJY, ).(Entered:03/04/2002) |
| 02/27/2003 | 20 | Trustee's Final Report Upon Dismissal of Case Filed by Michael B. Joseph - Chapter 13 Trustee.(Entered:02/27/2003) |
| 03/03/2003 | 21 | Order Approving Final Report and Account Upon Dismissal signed on 3/3/2003. (Related Document(s)20).(ALB,)(Entered:03/04/2003) |
| 03/05/2003 | 22 | Order Closing Case signed on 3/5/2003. (ALB, )(Entered:03/06/2003) |
| 03/26/2003 | | Bankruptcy Case Closed (MDW, ) (Entered:03/26/2003) |

Table 1. Sample Data Description[1]

| | Total | Non-converted-to-7 | Converted-to-7 |
|---|---|---|---|
| Total filing | 965 | 904 | 61 |
| Terminated | 817 | 756 | 61 |
| Discharged | 379 | 322 | 57 |
| Dismissed | 438 | 434 | 4 |
| Open | 148 | 148 | 0 |

Note: 1. The status of the cases are as of January 6, 2007.

Table 2. Summary Statistics: The Debtors

| | All cases | | | State or national[1] | | |
|---|---|---|---|---|---|---|
| Variable | Mean | S.d. | Median | Mean | S.d. | Median |
| **Demographics** | | | | | | |
| Married[2] | 0.45 | 0.50 | | 0.54 | | |
| Joint filing[2] | 0.36 | 0.48 | | | | |
| Family size | 2.68 | 1.54 | 2.00 | 2.50 | | |
| Home ownership[2] | 0.87 | 0.34 | | 0.72 | | |
| Pending lawsuits | 0.53 | 0.73 | 0 | | | |
| Foreclosure | 0.22 | 0.43 | 0 | 3.5e-03 | | |
| Filed for bankruptcy before | 0.22 | 0.41 | 0 | | | |
| **Employment Status** | | | | | | |
| Self-employed[2,3] | 0.05 | 0.21 | | 0.05 | | |
| Unemployed[2] | 0.04 | 0.20 | | 0.05 | | |
| Job tenure (yrs) | 5.44 | 8.04 | 1.50 | | | |
| **Income and Expenses** | | | | | | |
| Monthly income ($) | 2,901 | 1,689 | 2,600 | 4,066 | | 4,197 |
| Monthly expense ($) | 2,437 | 1,553 | 2,166 | | | |
| Excess income ($) | 463 | 517 | 384 | | | |
| **Assets and Liabilities** | | | | | | |
| Total assets ($) | 117,024 | 101,095 | 102,291 | 451,734 | 2,122,872 | 136,510 |
| Total debts-1 ($)[4] | 138,904 | 96,778 | 120,952 | 54,514 | 115,549 | 14,300 |
| Secured ($) | 107,150 | 78,111 | 99,850 | 52,677 | 114,713 | 12,100 |
| Priority ($) | 3,137 | 8,885 | 0 | | | |
| Unsecured ($) | 28,715 | 42,916 | 16,283 | 1,837 | 5,725 | 0 |
| Total debts-2 ($)[5] | 44,230 | 48,874 | 32,186 | | | |
| Total debt-2/asset | 1.14 | 3.97 | 0.33 | | | |
| Unsecured debt/total debt-2 | 0.55 | 0.57 | 0.31 | | | |

Note. 1. Information is obtained using 2000 U.S. Census, the Mortgage Bankers' Association, and 2001 Survey of Consumer Finances.

2. We do not report median for dummy variables.

3. We classify filers' self-employment status according to their occupation, and employer.

4. Total debt-1 includes secured as well as unsecured debt.

5. Total debt-2 is defined as arrears on secured debt plus unsecured debt.

Table 3. Summary Statistics[1]: The Plans

| Variable | Mean | S.d. | Median |
|---|---|---|---|
| **First proposed** | | | |
| Payment length (months) | 55 | 10 | 60 |
| Proposed excess payment length (months) | 16 | 16 | 7 |
| Average monthly payment ($) | 374 | 285 | 304 |
| Additional resources from houses[2] | 3.21e-02 | 0.18 | 0 |
| Additional resources from cars[2] | 2.60e-02 | 0.16 | 0 |
| Pay ratio to unsecured creditors | 0.22 | 0.32 | 7.03e-02 |
| Pay ratio to all creditors | 0.62 | 0.31 | 0.61 |
| **First confirmed** | | | |
| Payment length | 55 | 10 | 60 |
| Excess payment length | 18 | 18 | 8 |
| Average monthly payment ($) | 410 | 449 | 341 |
| Additional resources from houses[2] | 7.00e-02 | 0.26 | 0 |
| Additional resources from cars[2] | 8.81e-02 | 0.28 | 0 |
| Pay ratio to unsecured creditors | 0.24 | 0.34 | 7.43e-02 |
| Pay ratio to toal creditors | 0.65 | 0.32 | 0.64 |

Note: 1. We only report summary statistics for the non-converted cases where we collected plan information.

2. These variables are dummy variables and we do not report their median.

Table 4. Summary Statistics: Final Outcomes – 1

| Variable | # of cases | Fraction of whole sample | confirmed | terminated |
|---|---|---|---|---|
| Wage order | 505 | 0.64 | 0.59 | 0.50 |
| Confirmation | 794 | 0.82 | 1 | 0.79 |
| Converted to Chapter 7 | 61 | 0.06 | 0.05 | 0.07 |
| Dismissed without a confirmation | 151 | 0.16 | 0 | 0.18 |
| Discharged under Chapter 13 | 322 | 0.33 | 0.41 | 0.39 |
| Dismissed after confirmation | 283 | 0.30 | 0.36 | 0.35 |

Table 5. Summary Statistics: Final Outcomes – 2

| | Discharged (under Chp. 13) | | | Terminated | | |
|---|---|---|---|---|---|---|
| Variable | Mean | S.d. | Median | Mean | S.d. | Median |
| **Payments/face value of debt** | | | | | | |
| Secured | 1 | 0 | | 0.23 | 0.40 | 0 |
| Mortgage arrearage | 1 | 0 | | 0.33 | 0.44 | 0 |
| Priority | 1 | 0 | | 0.36 | 0.45 | 0 |
| Unsecured | 0.40 | 0.38 | 0.23 | 0.17 | 0.32 | 0 |
| All creditors | 0.57 | 0.33 | 0.54 | 0.28 | 0.34 | 0.13 |
| **Payments/total disbursement** | | | | | | |
| Secured | 0.19 | 0.27 | 0 | 0.16 | 0.25 | 0 |
| Mortgage arrearage | 0.22 | 0.28 | 0.03 | 0.24 | 0.29 | 0.09 |
| Priority | 0.09 | 0.21 | 0 | 0.13 | 0.27 | 0 |
| Unsecured | 0.34 | 0.33 | 0.21 | 0.21 | 0.31 | 0.04 |
| Attorney fees | 7.64e-02 | 0.12 | 0.04 | 0.17 | 0.25 | 0.07 |
| Trustee expenses | 5.35-02 | 8.52-03 | 5.53e-02 | 5.32e-02 | 1.27e-02 | 5.70e-02 |

Table 6. Maximum Likelihood Estimates – 1

| Parameters | Estimate | S.e. | T-Statistics |
|---|---|---|---|
| *Trustee's wage order decision* | | | |
| Proposed excess plan length | -2.55e-03 | 4.70e-03 | -0.54 |
| Attorney experience | 4.16e-03* | 1.30e-03 | 3.13 |
| Job tenure | 3.85e-02* | 9.00e-03 | 4.27 |
| Pending lawsuit | 9.13e-02 | 0.14 | 0.66 |
| Filed for bankruptcy before | -0.12 | 0.17 | -0.70 |
| Total debt relative to asset | 9.86e-03 | 1.70e-02 | 0.58 |
| Unsecured debt relative to total debt | 0.36 | 0.26 | -1.37 |
| Self-employed | -2.67* | 0.53 | -5.09 |
| Household size | 0.13* | 0.04 | 2.95 |
| *Trustee's first confirmation decision* | | | |
| Proposed excess plan length | 1.46e-02* | 6.20e-03 | 2.36 |
| Wage order | 1.87* | 0.22 | 8.53 |
| Attorney experience | 4.83e-03* | 1.80e-03 | 2.76 |
| Job tenure | 1.67e-02 | 1.33e-02 | 1.26 |
| Pending lawsuit | 0.17 | 0.89 | 0.19 |
| Filed for bankruptcy before | -0.24 | 0.21 | -1.17 |
| Total debt relative to asset | -2.79e-02* | 2.07e-02 | -1.17 |
| Unsecured debt to total debt | 1.44* | 0.33 | 4.39 |
| Self-employed | -0.32 | 0.33 | -0.97 |
| Household size | -0.05 | 0.06 | -0.92 |

Note. * indicates 95 percent confidence level and ** indicates 90 percent confidence level.

Table 7. Maximum Likelihood Estimates (continued)

| Parameters | Estimate | S.e. | T-Statistics |
|---|---|---|---|
| *Trustee's confirmation decision after payment shock* | | | |
| Proposed excess plan length | -3.45e-02* | 6.70e-03 | -5.25 |
| Wage order | -1.47* | 0.38 | -3.85 |
| Shock to payment ability | -7.74* | 1.27 | -6.11 |
| Attorney experience | -7.39e-04 | 2.80e-03 | -0.26 |
| Job tenure | 1.47e-02 | 1.81e-02 | 0.81 |
| Pending lawsuit | 0.49** | 0.28 | 1.76 |
| Filed for bankruptcy before | 7.08e-02 | 0.33 | 0.21 |
| Total debt relative to asset | 4.97e-02 | 4.61e-02 | 1.08 |
| Unsecured debt to total debt | 0.89** | 0.51 | 1.71 |
| Self-employed | -1.07 | 0.67 | -1.60 |
| Household size | -0.06 | 0.09 | 0.74 |
| *Other parameters* | | | |
| $\alpha\_\eta$ (the gamma distribution of payment shock) | 0.77* | 0.03 | 23.78 |
| $\rho$ (s.d. of measurement error $\varepsilon_3$, and $\varepsilon_5$) | 6.52e-02* | 5.70e-03 | 11.67 |
| Number of observations: 965; Log likelihood: -2456.66 | | | |

Note. * indicates 95 percent confidence level and ** indicates 90 percent confidence level.