Liquidity Constraints and Consumer Bankruptcy: Evidence from Tax Rebates*

Tal Gross† Matthew J. Notowidigdo‡ Jialan Wang§

January, 2012

Abstract

This paper estimates the extent to which legal fees prevent liquidity-constrained households from declaring bankruptcy. To do so, it studies how the 2001 and 2008 income tax rebates affected consumer bankruptcy filings. We exploit the randomized timing of the rebate checks and estimate that the rebates caused a significant, short-run increase in consumer bankruptcies in both years, with larger effects in 2008 when the rebates were more generous and more widely distributed. Using newly collected data from individual bankruptcy petitions, we document that households filing in the weeks after the rebates were distributed had higher total liabilities and debt-to-income ratios.

*We are grateful to Ben Keys, Erik Hurst, Neale Mahoney, Nick Souleles, and seminar participants at the University of Illinois, University of Miami, the Olin School of Business, the Federal Reserve Bank of Philadelphia, and Columbia University for useful feedback. We thank Ido Moskovich and Anthony Vashevko for helpful research assistance.

†Mailman School of Public Health, Columbia University.

‡Booth School of Business, University of Chicago and NBER.

§Olin School of Business, Washington University in St. Louis and NBER.

1 Introduction

Over the past three decades, consumer bankruptcy rates have tripled. As of the late 1990s, nearly ten percent of American households had declared bankruptcy (Stavins, 2000). By 2001, over 1.3 percent of American households were filing for bankruptcy every year (Zywicki, 2005). In an attempt to slow the increase in bankruptcies, the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) raised the barriers consumers must overcome in order to file for bankruptcy.

The BAPCPA requires that bankruptcy filers undergo mandatory credit counseling at their own expense. Furthermore, the act raises the legal and administrative fees that households have to pay in order to declare bankruptcy. These "entrance fees" for bankruptcy increased from an average of $921 before the reform to an average of $1,477 after the reform (GAO, 2008).

While there is a divisive debate over these entrance fees (Zywicki, 2005; Mann and Porter, 2010), there exists little empirical research estimating their effects. Unfortunately, economic theory provides little guidance, as the welfare consequences of entrance fees are theoretically ambiguous. On the one hand, fees may act as an ordeal mechanism, screening out households who stand to gain little from filing for bankruptcy (Nichols and Zeckhauser, 1982). On the other hand, the fees may prevent liquidity-constrained households from filing for bankruptcy, and those households may benefit the most from filing.

In this paper, we provide a first attempt to analyze the extent to which bankruptcy's entrance fees prevent liquidity-constrained households from being able to declare bankruptcy. To do so, we exploit plausibly exogenous variation in liquidity induced by the 2001 and 2008 income tax rebates. The rebates were distributed over 9–10 week periods in both years, and households received between $300 and $1,200. The date households received their rebates was effectively randomly assigned, which allows us to estimate the causal effect of a one-time,

anticipated increase in liquidity on consumer bankruptcy filings.

We find that the tax rebates led to a significant, short-run increase in consumer bankruptcies. In 2001, bankruptcies increased by roughly 2 percent in the weeks after the rebates were distributed, and in 2008 (when the rebates were more generous and more widely distributed), bankruptcies increased by roughly 7 percent. We interpret the short-run increase in bankruptcies as transitory, and we present evidence that supports this interpretation. Therefore, we conclude that the tax rebates allowed some households to file for bankruptcy significantly earlier than they otherwise would have been able to.

Households can file for bankruptcy under two chapters of the bankruptcy code: Chapter 7 and Chapter 13.[1] The tax rebates increased Chapter 7 filings, but had a small, negative effect on Chapter 13 filings. This distinction is consistent with the existence of liquidity constraints, as households filing for Chapter 13 must pay higher legal fees, but are allowed to pay the fees gradually after filing. By contrast, households filing for Chapter 7 bankruptcy typically must pay their attorneys before the bankruptcy can be filed.

We find further evidence of liquidity constraints by studying the characteristics of bankruptcy filers before and after the rebates. We construct a new data set based on a random sample of digitized bankruptcy petitions. Using these data, we estimate that the households filing in the weeks after the rebates were distributed had higher total liabilites and debt-to-income ratios.

To interpret our results, we develop a simple model of consumer bankruptcy (Wang and White, 2000). Motivated by the relevant case law regarding how bankruptcy courts treated the tax rebates, the model suggests that the tax rebates should only affect the filing decisions of liquidity-constrained households. Therefore, the model allows us to translate our empirical results into an estimate of the share of households who wish to file for bankruptcy

[1] A tiny share of households (much less than one percent) file under Chapter 11. We exclude such households from our sample.

but cannot afford to do so given the costs of filing. Combining our model and empirical results, we conclude that 1.7 percent of households who wished to file bankruptcy in 2001 and 4.0 percent of households in 2008 were sufficiently liquidity-constrained that could not afford to file for bankruptcy in the absence of the tax rebates in those years. The larger share in 2008 is likely driven by the larger average value of the rebate checks as well as the severe recession, which likely increased the number of liquidity-constrained households.

Our empirical results are consistent with the existing evidence that some households are severely liquidity constrained, and our paper contributes to the literature on the economic effects of these constraints. Liquidity constraints have been shown to cause excessive consumption responses to transitory changes in income (Shapiro and Slemrod, 2003; Souleles, 1999; Hsieh, 2003; Stephens, 2003), limit investment in human capital (Dynarski, 2003), and amplify the behavioral response to unemployment insurance benefits (Chetty, 2008).[2] Additionally, liquidity constraints likely play an important role in the optimal design of social insurance programs (Chetty, 2008; Hansen and İmrohoroğlu, 1992). Since consumer bankruptcy functions—at least in part—as a social insurance program, our paper is broadly related to the literature on the role of ordeal mechanisms and entrance fees in the optimal design of social insurance programs (Nichols and Zeckhauser, 1982). We discuss below how our estimates shed light on the welfare consequences of changing the fees associated with filing for consumer bankruptcy.

Our paper is also part of a growing literature studying the economic effects of tax rebates. Most related papers focus on the effects of the tax rebates on consumption and expenditures (Johnson et al., 2006; Agarwal et al., 2007; Shapiro and Slemrod, 2003; Bertrand and Morse, 2009), while other studies have estimated the effect of the tax rebates on mortality and morbidity (Evans and Moore, 2011; Gross and Tobacman, 2011). To our knowledge, no studies

[2]By contrast, Hurst and Lusardi (2004) do not find clear evidence that liquidity constraints restrict entry into entrepreneurship.

have focused on the effect of the tax rebates on enrollment in social insurance programs in general or consumer bankruptcy in particular.

The tax rebates were designed to stimulate the economy. Our results therefore shed light on how the rebates actually stimulated consumption. Previous studies have concluded that households consumed a moderate-to-large share of the rebates (Johnson et al., 2006; Parker et al., 2010). Our results suggest that many households used the rebates to file for bankruptcy. Moreover, households may increase consumption by a great deal after bankruptcy (Filer and Fisher, 2005; Zhu, 2011). Thus our results suggest that—for some households—the rebates may have increased short-run consumption by more than the amount of the rebates themselves. In this sense, reducing the barriers to bankruptcy may be a particularly effective economic stimulus, as the timely discharge of household debt may increase household consumption substantially (Mian et al., 2011).

The remainder of the paper proceeds as follows. The next section provides background on the tax rebates and describes the bankruptcy data that we have compiled. Section 3 outlines a theoretical model that explains how the income tax rebates can affect bankruptcy rates. Section 4 demonstrates how the rebates affected the number of bankruptcies. Section 5 describes how the characteristics of the filers changed after the rebates. Section 6 discusses the alternative explanations for our findings and their policy implications. Section 7 concludes.

2 Background on the Bankruptcy Data and the Tax Rebates

In order to estimate the impact of the rebates on bankruptcy rates, we have compiled a unique data set based on the Public Access to Court Electronic Records system.[3] Our sample consists of all consumer bankruptcy filings in the 72 courts that agreed to grant us

[3]We are grateful to Tom Chang for providing some of the computer code necessary to parse the electronic records.

full electronic access to their dockets. Figure 1 presents a map of our sample coverage. We verified that the data match aggregate counts of bankruptcies reported by the Administrative Office of the US courts.

Table 1 compares the characteristics of districts in our sample to those not in our sample. The sample covers roughly 74 percent of bankruptcies in the United States and 73 percent of the population. Coverage remains consistent across our sample period, which extends from 1998 to 2008. The districts in the sample have populations with slightly lower income, less college education, and a lower unemployment rate.

The tax rebates were disbursed as part of the economic stimulus bills passed by Congress in 2001 and 2008, and were specifically designed to stimulate the economy during the ongoing recessions.[4] The Internal Revenue Service (IRS) sent the rebate checks on a schedule determined by the head-of-household's social security number (SSN). Table 2 presents the dates on which checks were sent. We include in our sample all bankruptcies that were filed at most 30 weeks prior to the date that checks were sent and at most 40 weeks after that date.[5] In 2001, social security numbers were divided into ten equally-sized groups. Checks were mailed from the 20$^{\text{th}}$ of July through the 21$^{\text{st}}$ of September. The payments ranged from \$300–\$600.[6] In 2008, households could elect to receive their stimulus payments via either check or direct deposit. As indicated in the third panel of Table 2, there were only three dates on which direct-deposit transfers were made. Roughly 40 percent of households elected to receive their rebate checks via direct deposit (Parker et al., 2010). The rebate payments were higher in 2008 than in 2001, ranging from \$300–\$600 for single filers to \$600–\$1200 for

[4]The rebates were mandated by the Economic Growth and Tax Relief Reconciliation Act of 2001 and the Economic Stimulus Act of 2008.

[5]We restrict the sample by time relative to when the checks were sent, so that we have the same number of observations for each group. The results are similar when we restrict by absolute, calendar time and are also similar when we extend the sample window.

[6]Individual tax filers with no dependents could receive up to \$300 through the rebate, single parents a maximum of \$500, and married couples jointly filing could receive \$600. To receive the full amount, a single taxpayer had to have earned at least \$6,000 in taxable income in 2000 while a married couple jointly filing had to have earned at least \$12,000 in taxable income.

couples.[7]

Figure 2 summarizes the bankruptcy rates by two-digit SSN group. Reassuringly, the figure demonstrates that there is no systematic variation in bankruptcy rates across SSN groups in the months leading up to the rebates.[8]

3 Conceptual Framework

This section presents a simple model that describes how an increase in liquidity can affect bankruptcy rates. The model suggests that liquidity-constrained households are the only households who change their filing behavior after the rebates. Such households can only file after receiving the rebates. Thus bankruptcy rates increase after the rebates are distributed, and the increase is driven by liquidity-constrained households.

3.1 Model Assumptions

Consider the following three-period model. In period 0, households borrow an exogenous amount of debt, B. We assume that debt is exogenous because of our empirical setting. All households eventually receive the rebate within a short window of time, so neither the amount nor maturity of their debt should depend on the timing of the rebates.

In period 1, households' wealth, $W \sim f(w)$, is realized. In addition, households anticipate receiving the rebate, with value I, in period 2. Households can decide to file in period 1, in period 2, or not at all. Households consume all of their wealth net of debt and bankruptcy costs at the end of period 2.[9]

[7] If a filer's 2007 tax return indicated over $3,000 in qualifying income, the filer was eligible for at least the minimum payment based on the following general guidelines: $300 to $600 for individuals, $600 to $1,200 for joint filers, and $300 for each qualifying child.

[8] An F-test fails to reject the hypothesis that the bankruptcy rates are equal across all groups with a p-value of 0.726 in 2001 and 0.864 in 2008.

[9] We assume no consumption takes place in period 1. Including consumption in period 1 would not qualitatively change our results. It would, however, introduce another mechanism whereby some low-wealth households that could technically afford to file would choose to file for bankruptcy in period 2 rather than in period 1 due to the high marginal utility of consumption in period 1.

Households file for bankruptcy when it is financially beneficial to do so, even if they have the ability to repay their debts (Fay et al., 2002). Specifically, households decide whether and when to file by maximizing consumption in period 2 subject to liquidity constraints. If a household declares bankruptcy, it pays a fixed filing fee, c, and loses a share $1 - e$ of its wealth. The parameter e captures the generosity of the exemptions provided by the bankruptcy court.[10] A larger value of e means that a larger share of the household's wealth is exempt and does not need to be turned over to the bankruptcy court during a bankruptcy filing. Once the household has filed for bankruptcy, it is absolved of its debts.[11]

A key assumption of the model involves how the bankruptcy court treats the filers' tax rebates. We assume that the tax rebate is treated the same whether the household files in period 1 or in period 2, and we further assume that the rebate is treated identically to the rest of the household's wealth. This assumption implies that households will not strategically manipulate their filing date to try to shield their rebate from the courts. The relevant case law strongly supports this assumption.[12] If some households nonetheless choose to file before receiving their rebates in an attempt to prevent them from becoming part of the estate, then we would underestimate the percentage of constrained filers. We discuss this possibility below. But given the assumptions above, consumption is equal to $e \cdot (W + I - c)$ if a household decides to file for bankruptcy and $W + I - B$ otherwise.

[10] In practice, exemptions are governed by both federal and state bankruptcy law. Exemption levels vary widely by state and have been relatively stable at the state level since the early twentieth century (Mahoney, 2010; Gropp et al., 1997).

[11] Bankruptcy in this model is a composite of Chapter 7 and Chapter 13 bankruptcy. While in practice Chapter 13 filers repay their debts based on a three to five year schedule, our framework can capture this by setting the present value of repayments to $1 - e$ times wealth net of legal fees.

[12] Several court cases (in re Rivera, in re Lambert, in re Howell, and in re Alguires) have established that for bankruptcies filed after the passage of the two stimulus acts, the tax rebates become property of the bankruptcy estate and are subject to normal rules governing other cash assets.

3.2 Bankruptcy Filing Decisions

When deciding whether or not to file for bankruptcy, households face the following constraint. The filing fee, c, must be paid in advance, so it must be the case that $W > c$ if the household declares bankruptcy in period 1 and $W + I > c$ if the household declares bankruptcy in period 2. This assumption is particularly relevant for Chapter 7 filings. Court fees of approximately \$300 are paid in advance for both Chapter 7 and 13 filings. Legal fees for Chapter 7 are almost always paid in advance, while those for Chapter 13 are often paid gradually, through the filer's payment plan.

Household filing behavior depends on the level of realized wealth in period 1. We can divide households into several groups. Some households have sufficient wealth that they do not file for bankruptcy at all. Such wealthy households are those for which

$$W + I - B \geq e \cdot (W + I - c) \Rightarrow \quad W \geq \frac{B - e \cdot c - I \cdot (1 - e)}{1 - e}. \tag{1}$$

Other households file for bankruptcy because it is financially advantageous to do so. The wealth of such households must satisfy two constraints. First, they are able to pay the filing fee in period 1 and in period 2, thus $W > c$. Second, it is in their economic interest to file for bankruptcy. Such households then have wealth that satisfies:

$$c < W < \frac{B - e \cdot c - I \cdot (1 - e)}{1 - e}. \tag{2}$$

These households are indifferent between filing in period 1 versus filing in period 2. Consistent with the characteristics of a typical bankruptcy, we assume that B is large relative to c so that there exist households within this range of wealth. Because B is large relative to c and the bankruptcy court treats the rebate as identical to other assets, a household that can pay its debts by definition can also afford the filing fee. Therefore, there is no incentive for

an unconstrained household to manipulate its filing date. Any *change* in filing rates between period 1 and period 2 will not be due to such households.

Finally, there exist households whose wealth is less than their debts but that do not have enough wealth to file in period 1.[13] Such liquidity-constrained households cannot borrow to pay the filing fee in period 1, and so must wait until period 2 to file for bankruptcy. By definition, then, such households have wealth that satisfies:

$$c - I < W < c. \tag{3}$$

These households can only afford to file in period 2. Figure 3 shows how equations (1) through (3) divide households into groups based on realized wealth.[14]

3.3 Predictions of the Model

The model implies that only liquidity-constrained households change the date of their bankruptcy based on the tax rebates. Such households can only afford to file *after* receiving their rebate checks.

The model also yields a direct interpretation of our empirical estimates. Let X be the share of households that are unconstrained and declare bankruptcy, and let Y be the share of households that are unable to file at time 1 but can file at time 2:

$$\begin{aligned} X &= \int_{c}^{\frac{B-e\cdot c-I(1-e)}{1-e}} f(W)dW \\ Y &= \int_{c-I}^{c} f(W)dW. \end{aligned}$$

[13] A final type of household is of little interest, given our empirical setting. Households with wealth $W < c - I$ have so little wealth that they cannot afford the filing fee either in period 1 or in period 2. These households will remain constrained and unable to file. They will be unaffected by the rebates and we will not observe them in the data.

[14] The value $c - I$ is non-negative as long as the costs of filing are greater than the value of the rebates. The value of the rebates were, at most, \$600 in 2001 and \$1,200 in 2008. In contrast, average bankruptcy costs are estimated at \$1,477 in 2007 (GAO, 2008).

Since unconstrained filers are indifferent between filing in period 1 or in period 2, we assume that half file in each period. The regressions below measure the percent change in bankruptcies after the tax rebates are sent. This empirical estimate, β, is the share of households filing in period 2 that are constrained filers. The model thus suggests that

$$\beta = \frac{Y}{\frac{1}{2} \cdot X}. \tag{4}$$

Finally, we relax one of the model's key assumptions. Consistent with several legal decisions, the model assumes that courts treat the rebate checks as a part of the bankruptcy estate regardless of whether households file in period 1 or period 2. However, suppose that some households are unaware of this and choose to file at period 1 in an effort to hide the rebates from the court. In this case, the share of households that are unconstrained and file at period 1 would be equal to $\gamma \cdot X$, where $\gamma > \frac{1}{2}$. In this case, the empirical estimates would equal:

$$\beta = \frac{Y - (1-\gamma) \cdot X}{\gamma \cdot X} < \frac{Y}{\frac{1}{2} \cdot X}. \tag{5}$$

Our empirical results would therefore under-estimate the fraction of filers who are constrained. Thus, to the extent that households misperceive the laws regarding the treatment of rebates under bankruptcy, our regressions will provide a lower bound for the share of bankruptcy filers who are liquidity constrained.

Additionally, not all households received rebate checks. Assume that a fraction λ of households receive rebate checks. If we assume that households that received rebate checks are otherwise identical to households that did not, then our empirical estimate equals:

$$\beta = \frac{\lambda \cdot Y}{\frac{1}{2} \cdot \lambda \cdot X + \frac{1}{2} \cdot (1-\lambda) \cdot (X+Y)}. \tag{6}$$

We can use equation (6) to translate our empirical estimates (β) into an estimate $s =$

$Y/(X+Y)$, the share of households who wish to file for bankruptcy but cannot afford to do so in the absence of the rebate. Equation (6) suggests that $s = Y/(X+Y)$ as follows:

$$s = \frac{\beta}{\lambda \cdot (2+\beta)}. \tag{7}$$

We use this expression below to translate our regression estimates into estimates of s.

4 The Effect of the Tax Rebates on Bankruptcies

This section presents our main empirical results. We first describe how the bankruptcy rate changed after the tax rebates were distributed. We then describe how the rebate effect evolved over time.

4.1 The Change in the Bankruptcy Rate After the Rebates

The way in which both the 2001 and 2008 tax rebates were distributed lends itself to a simple difference-in-difference empirical framework. For the 2001 sample, we construct aggregate counts of bankruptcies by two-digit SSN group (g) and week (w), and estimate the following regression:

$$y_{gw} = \beta \cdot I\{\text{Rebate Check Sent}\}_{gw} + \alpha_g + \alpha_w + \varepsilon_{gw}. \tag{8}$$

The outcome y_{gw} is either the number of bankruptcies in group g and week w or its logarithm, and α_g and α_w are group and week fixed effects, respectively. For the 2008 sample, we include an additional indicator function to control for whether the SSN group has been given its direct deposit.

Panel A of Table 3 presents estimates of this regression for the 2001 rebates, while panel B presents estimates for 2008. The first two columns present results when the level and the logarithm of Chapter 7 bankruptcies is the outcome of interest, respectively. Both columns

suggest a significant increase in Chapter 7 filings after the rebates were distributed. In 2001, each two-digit SSN group experienced an average of 5.6 additional bankruptcies per week. The estimates in column two indicate a 3.8 percent increase in bankruptcies after the rebates.

Panel B demonstrates that this effect was larger in 2008. The bankruptcy rate increased by 5.1 percent after the 2008 rebate checks were sent. But bankruptcies also increased by 6.2 percent after direct deposits were made. The total increase in bankruptcies after the 2008 tax rebates was thus 11.3 percent.

There are several possible explanations for the larger rebate effect in 2008. First, the rebate checks were larger in 2008, and the larger rebate checks may have enabled more liquidity-constrained households to file for bankruptcy. Second, the rebate checks were more widely distributed: roughly 85 percent of households received rebate checks in 2008 versus 57 percent in 2001 (Johnson et al., 2006; Parker et al., 2010). Third, the recession was more severe in 2008, which could have resulted in more liquidity-constrained households. All of these explanations would suggest a larger effect in 2008. Additionally, the BAPCPA dramatically changed the bankruptcy system in the intervening period (McIntyre et al., 2010), raising attorney fees and encouraging households to choose Chapter 13 rather than Chapter 7. The expected effect of these legal changes on the 2008 results is less clear.

In contrast to the results for Chapter 7 filings, Table 3 suggests that the rebates had a smaller impact on Chapter 13 bankruptcies. Columns 3 and 4 present point estimates for Chapter 13 bankruptcies that are much smaller in magnitude than those for Chapter 7. The estimates suggest a 1–2 percent decrease in Chapter 13 filings, a decrease that is statistically significant in 2001 but not in 2008. The small decrease in Chapter 13 filings suggests that some households may have switched from Chapter 13 to Chapter 7 after the tax rebates. The increase in Chapter 7 filings, however, is much larger than the decrease in Chapter 13 filings, thus the filers who switch represent a small share of bankruptcies affected by the rebates.

This contrast between chapters is consistent with the existence of liquidity constraints. There are two relevant differences between Chapter 7 and Chapter 13. First, Chapter 7 filers have lower incomes and fewer assets than Chapter 13 filers. Second, households who file under Chapter 13 are charged higher legal fees, but are allowed to pay their attorneys after filing.[15] Chapter 7 filers, on the other hand, must usually pay their attorneys in advance of filing. Both of these differences suggest that Chapter 7 filers are more likely to be liquidity constrained.[16] And, indeed, Table 3 presents a much larger rebate effect for Chapter 7 bankruptcies.

Finally, columns 5 and 6 of Table 3 present estimates for Chapter 7 and Chapter 13 filings combined. The point estimates are positive and statistically significant at conventional levels. They suggest that consumer bankruptcy filings overall increased by 2.3 percent in 2001 and by 6.8 percent in 2008. Using equation (7), we can convert the estimated rebate effects into estimates of s, the share of bankruptcy filers who are constrained. The results suggest that $s = 1.7$ percent in 2001 and $s = 4.0$ percent in 2008.[17] The rebates were larger in 2008, and thus we estimate that a greater share of filers in 2008 were liquidity constrained.[18]

The remainder of this section discusses a simple falsification test. Figure 4 presents the results of this test. Each point represents estimates from specifications identical to those in column 2 of Table 3, but which are estimated for each year in our sample. We focus on Chapter 7 filings since our main effect is most pronounced for Chapter 7, and rely on the log-based specification in order to control for differences in filing rates across years. Tax rebates were *not* distributed by SSN group in years other than 2001 and 2008, but we construct

[15] We constructed a random sample of 2001 and 2008 filings from the Central District of California. The average total cost of a Chapter 7 bankruptcy was $1,100, while the average total cost of a Chapter 13 bankruptcy was $1,749. The average attorney fees paid before filing were $995 for Chapter 7 and $684 for Chapter 13.

[16] An additional reason for the contrast by chapter is that a large share of Chapter 13 filers turn to bankruptcy in order to halt a foreclosure (Mann and Porter, 2010). The timing of such bankruptcies is then determined by the foreclosure process rather than by rebates.

[17] Since more households received the rebate in 2008, this results in a greater adjustment of the 2008 estimates.

[18] Our model implies that $\partial s / \partial I > 0$.

indicator variables as if they were. Specifically, we construct placebo indicator variables consistent with the 2001 rebate distribution for 1998 through 2004. For 2005 through 2008, we construct placebo indicator variables consistent with the 2008 rebate distribution, and plot the sum of the paper check and direct deposit placebo effects.

The figure presents no evidence of a strong rebate effect in any years other than those in which rebates were actually distributed. In all placebo tests, the confidence intervals do not exclude zero. A joint test of the hypothesis that all estimates except those for 2001 and 2008 are equal to zero fails to reject the null hypothesis with a p-value of 0.136. In contrast, a joint test that the 2001 and 2008 estimates are jointly equal to zero leads to a p-value less than 0.001.

4.2 Variation in the Rebate Effect Over Time

This section describes how filing rates evolved over the weeks surrounding the rebates. To measure such patterns, we estimate an event-study specification. We modify the regression equation above to include indicator variables for 2-week intervals before and after the rebates. The 2 weeks before each group received its rebate is the omitted category.

Figure 5 presents the estimates from that regression when the outcome is the logarithm of Chapter 7 filings in 2001. The dotted lines plot 95-percent confidence intervals and the solid line plots the point estimates. The figure demonstrates that the bankruptcy rate increased by roughly 4 percent in the month after the rebates were distributed, and the treatment effect decreases monotonically after week 4.[19] Figure 6 presents analogous estimates for 2008 which show a similar pattern.[20]

[19]The results in Figure 5 suggest a modest, marginally significant increase in filing rates 3 and 4 weeks *before* the checks are sent in 2001. In contrast, Figure 6 suggests no discernable pre-trend in 2008. We cannot identify a cause for the pre-trend in Figure 5; potentially, households may have filed early, hoping to receive their rebates after their bankruptcy case was discharged. We view this as unlikely, however, as bankruptcies generally last for months, and judges were aware of the pending rebates. Nevertheless, it is possible that some households misperceived the laws regarding how the rebates were treated by the bankruptcy courts.

[20]The regression underlying Figure 6 also includes an indicator variable for whether the SSN group had received its direct deposit, so that these event study estimates report the dynamic effects of the rebates sent

Figure 7 and Figure 8 present the same event-study estimates for Chapter 13 bankruptcies in 2001 and 2008. Nearly all of the point estimates are statistically indistinguishable from zero, though the figures suggest a slight decline in Chapter 13 bankruptcies following the rebates, consistent with the results in Table 3.

As a whole, these figures suggest that the tax rebates led to an immediate, short-run increase in Chapter 7 bankruptcies. The increase in bankruptcies lasted for roughly four weeks after the rebates were distributed.

We interpret these results as providing evidence of the short-run, transitory effect of the rebates on consumer bankruptcies. We cannot identify households that did not receive a rebate, and all SSN groups eventually received rebates; therefore, we cannot estimate the long-run effects of the rebates. We strongly suspect, however, that the rebates had little permanent effect on bankruptcy filing rates. Instead, our estimates likely represent a shift in the timing of bankruptcies for households who were unable to file when they first wished to do so. We have two pieces of evidence in support of this interpretation. First, the pattern of event-study coefficients suggests the absence of a long-run effect; the estimated coefficients on the furthest lags are statistically and economically insignificant. Additionally, Appendix Table A1 reports results of an alternative specification that attempts to estimate the permanent effect of the rebates by comparing bankruptcy rates across months in different years. The test assumes that the permanent effect of the rebates can be estimated by comparing the total number of bankruptcies in the months during and after the rebates with the same months in other years, controlling for (within-year) seasonality in bankruptcy filings and controlling for long-run (across-year) trends in bankruptcy filings.[21] Consistent

through the mail. A similar event study graph using the direct deposit dates is extremely imprecise due to the fact that there are only three direct deposite dates that are three weeks apart. This makes it very difficult to estimate the dynamic effects of the rebates sent via direct deposit. By contrast, the paper dates span roughly two months and are sent out at nine different dates.

[21] An important weakness of this strategy is that it assumes that the timing of the rebate programs was exogenous. This is unlikely to be true; the rebate programs themselves were a political response to macroeconomic conditions that likely affected overall bankruptcy filings. Nevertheless, we are reassured by

with the event-study figures, Appendix Table A1 also suggests no permanent effect of the 2001 tax rebates.[22]

4.3 Variation in the Rebate Effect by Local Characteristics

This section tests how local characteristics are associated with the rebate effects. We record the zip code of residence for each bankruptcy filer in our database. We merge those zip codes to median household income, as measured in the 2000 decennial census. This allows us to stratify our main specification by income. We also stratify filers by a proxy for their access to credit. Following Mian and Sufi (2009), we merge each zip code to the share of its residents in 1996 that were categorized as sub-prime borrowers.[23]

The theoretical model in Section 3 predicts that areas in which liquidity constraints are more prevalent should be associated with larger rebate effects. Thus, if low income and sub-prime borrowing predict liquidity constraints, then these proxies should be associated with larger rebate effects. Liquidity, however, is determined by the difference between a household's income and expenditures, not just income or sub-prime status. Therefore, it is not clear a priori whether such proxies will have a discernible relationship with the rebate effect.

Table 4 presents estimates of equation (8) for Chapter 7 bankruptcies when the sample is stratified by terciles of these two variables. The first three columns present results for terciles of median income. The point estimates form different patterns in the two rebate years. In 2001, the point estimates suggest a U-shaped pattern; the second tercile of income is associated with the smallest rebate effect. In 2008, the first tercile of income is associated

the similarity between the time-series results and the furthest lagged coefficients in the baseline model which suggest no permanent effects of the rebates.

[22]We only estimate the long-run effect of the 2001 tax rebate, because we have too little data after the 2008 rebates.

[23]The variable captures the share of adults in the zip code whose FICO credit score was 660 or lower in 1996 (Mian and Sufi, 2009). We are extremely grateful to Atif Mian and Amir Sufi for assistance in acquiring these data.

with the smallest total rebate effect. We emphasize, however, that none these differences across the terciles is statistically significant at conventional levels.

The last 3 columns of Table 4 present results when the sample is stratified by the likelihood of being a sub-prime borrower. The results also do not suggest a clear pattern. A Wald test of equality of the three coefficients in 2001 has a p-value of 0.11, and in 2008 the associated p-value is 0.82. Therefore, we cannot reject the hypothesis that households from all terciles exhibited the same rebate effect.

Overall, these results suggest a weak relationship between local characteristics and the rebate effect. The pattern of point estimates by tercile suggests that the rebate effect is not monotonically related to these proxies. Interestingly, Johnson et al. (2006) and Parker et al. (2010) find a non-monotonic effect for consumption. Both studies find that low- and high-income households exhibit a higher sensitivity to tax rebates than middle-income households. The 2001 results in Table 4 exhibit the same pattern. Such a pattern suggests a complex relationship between liquidity and income, although we do not have enough precision to reach strong conclusions on this point.

5 Analysis of Filers' Characteristics

While the results above demonstrate that Chapter 7 bankruptcy rates increased after the tax rebates, a remaining question is which types of filers were responsible for that increase. In this section, we describe how the average characteristics of bankruptcy filers changed after the rebates. To do so, we collected legal documents for a random sample of consumer bankruptcies in ten districts.[24] We randomly selected 250 Chapter 7 filings from each district

[24]We selected the districts based on whether the court judge was willing to grant us a waiver to download the files, and whether electronic records were available from both 2001 and 2008. The ten districts were: the Central District of California, the Northern and Southern Districts of Iowa, the Western District of Louisiana, the Southern District of New York, the Eastern and Western Districts of Oklahoma, the District of South Carolina, the Eastern District of Texas, and the Northern District of West Virginia.

in 2001 and 500 filings per district in 2008.[25] For each filing, research assistants read the associated legal documents and recorded the financial characteristics of the household.

5.1 Sample Statistics

Households declaring bankruptcy must reveal many financial and demographic details to the court. Summary statistics for these details are presented in Table 5. The first set of rows describe the demographics of filers. These average characteristics changed relatively little between 2001 and 2008. For instance, the percentage of primary filers who were female increased from 24 percent to 25 percent between the two years. A t-test fails to reject that the fraction of female filers remained constant (the associated p-value is 0.53). Filers were single in 34–35 percent of cases, separated or divorced in 16–20 percent of cases, and married in 46–49 percent of cases.[26]

The next set of rows in Table 5 describe the fees paid by filers. Fees generally increased from 2001 to 2008, largely driven by the BAPCPA. Filing fees are paid to the court at the time of filing. The BAPCPA standardized filing fees to $299 for all Chapter 7 cases starting in 2005, increasing the average filing fee 50 percent from 2001 to 2008.[27] Average legal fees increased 70 percent from $746 in 2001 to $1,265 in 2008; that difference across years is statistically significant at the 1-percent level.[28]

As shown in Table 5, the majority of legal fees are paid by the time of filing. Despite the increase in fees, the percentage of fees paid increased from 79 percent in 2001 to 86 percent in 2008. Instead of paying for formal legal representation, filers can elect to represent themselves

[25] Twice as many filings were used in 2008 because the significant fraction of households receiving direct deposits instead of checks decreases the precision of our estimates.

[26] All filers were categorized into one of three marital-status categories according to the bankruptcy petition. If no marital information was provided, we categorized the filer as single. A χ^2-test fails to reject that the shares of filers in the marital status categories changed between 2001 and 2008, p-value 0.18.

[27] A small number of filers receive waivers for the filing fees or arrange to pay them on installment. We find that fewer than 1 percent fail to pay the full amount by the time of filing.

[28] These numbers are roughly consistent with findings by the Government Accountability Office that attorney fees increased from $712 in 2005 to $1,078 in 2007 (GAO, 2008).

in court and pay a smaller amount for legal advice and document preparation. The share of filers representing themselves declined from 3.4 percent to 1.8 percent. This last comparison suggests that the increased paperwork required by the BAPCPA made it more difficult for filers to forego formal legal representation.

The last set of numbers in Table 5 present statistics on the filers' finances. These statistics suggest three general patterns. First, filers were significantly wealthier in 2008 than in 2001. Average monthly income increased from $2,048 to $2,693, total assets increased from $70,923 to $112,259, and total liabilities increase from $136,541 to $181,823.[29] These patterns are surprising since a main goal of the BAPCPA was to discourage high-income households from filing for Chapter 7 bankruptcy. At the same time, the average liabilities-to-income ratio rose from 72 in 2001 to 76.8 in 2008, suggesting greater indebtedness. Consequently, it is not clear from these simple comparisons whether filers were more or less liquidity constrained in 2008.

Another pattern is that filers' liabilities dwarf their assets and income. In both years, the the average filer bore liabilities over 70 times larger than their monthly income and nearly twice as large as total assets. Finally, it is important to note that these financial variables are heavily skewed. For instance, mean liabilities in 2001 were $135,649 while the median was less than half as large: $61,989. As a result, we take the logarithm of these variables in the regression analysis reported in Appendix Table A2.

5.2 Effect of the Rebates on the Characteristics of Bankruptcy Filers

This section presents evidence of the effect of rebates on the characteristics of households filing for bankruptcy. Both our model and the estimates in section 4 suggest that the number of liquidity-constrained filers increases in the weeks after the rebates. This should lead to a change in the average characteristics of the filers.

[29]These differences across years are statistically significant at the 1-percent level

We evaluate whether the rebates changed the characteristics of filers by presenting the distribution of several financial characteristics: (1) total liabilities, (2) debt-to-income ratio, (3) income, and (4) legal fees paid at filing. The distributions allow us to compare those who filed before to those who filed after the rebates. We also report Kolmogorov-Smirnov (K-S) tests of the equality of these distributions. Additionally, Appendix Table A2 reports regression tables analogous to the figures presented in this section.[30]

Figure 9 and Figure 10 present empirical cumulative distribution functions for the total liabilities of filers in 2001 and 2008. In each figure, the solid line plots the distribution of total liabilities for those who filed after the rebates, while the dashed line plots the distribution for the filers who filed before the rebates. Both figures suggest that filers who filed after the rebates had higher total liabilities. In both figures, the associated K-S test rejects the null hypothesis that the distributions are identical.

Figure 11 and Figure 12 present a similar pattern for the ratio of total liabilities to income of each filer (debt-to-income ratio). The post-rebate filers have higher debt-to-income ratios. In contrast, we find no evidence that the distribution of income differs across the two groups of filers (Figure 13 and Figure 14).

Overall, the results above suggest that households filing for bankruptcy after the rebates are more likely to be liquidity constrained. Households filing after the rebates have larger liabilities and a higher debt-to-income ratio than households filing before the rebates. In contrast, they have roughly similar incomes.

6 Discussion

This section explores alternative explanations of our empirical results, and also discusses their policy implications.

[30]The results in Appendix Table A2 are qualitatively similar to the figures reported in the main text, although the statistical precision is somewhat limited, especially when we include week fixed effects.

6.1 Alternative Explanations

We consider two alternative explanations for our findings. A first alternative explanation is that households timed their bankruptcy in order to keep their rebates from creditors or the court. This explanation, however, is unlikely. All pre-filing income and assets are subject to creditor action. Thus households trying to shield the rebate income from creditors would have to file months *before* the rebates were sent.[31] We find no evidence for such an effect. Were it to exist, this effect would bias our difference-in-difference estimates towards zero. Finally, as described in footnote 12 above, bankruptcy judges were aware of the rebates and were instructed to treat rebate income identically to other income.

A second alternative explanation is that households timed their bankruptcy so that they could consume the rebates before filing. This second explanation is also unlikely. The average "wild card" exemption under Chapter 7 is $7,073 (Mahoney, 2010). It is unlikely that the rebates shifted a large share of households beyond that threshold. Moreover, if households were to file for bankruptcy only after consuming their rebates, then we would observe a decrease in bankruptcies before the rebates were distributed. The empirical findings above do not suggest such a decrease. Finally, this alternative explanation cannot account for the change in average liabilities before and after the rebates, as demonstrated in section 5.

6.2 Policy Implications

Our empirical evidence suggests that legal fees force liquidity-constrained households to delay filing for bankruptcy. It is not obvious, however, whether lower fees would raise welfare. The effect of fees on social welfare depends on whether liquidity-constrained filers are those with the largest or the smallest utility gain from bankruptcy. If liquidity-constrained filers have the most to gain from bankruptcy, then entrance fees are likely to be socially inefficient.

[31] Bankruptcy cases are open for many months. The filer can choose the filing date, but cannot choose the closing date.

In this case, the bankruptcy system could otherwise rely on exemptions and the seizure of assets to deter bankruptcies. Conversely, if liquidity-constrained filers gain less from bankruptcy than other filers, then entrance fees may serve as an efficient mechanism to deter such bankruptcies. In this way, liquidity constraints transform entrance fees into ordeal mechanisms (Nichols and Zeckhauser, 1982).

We speculate that reducing court and legal fees is likely to improve social welfare. The theoretical model in Section 3 suggests that constrained households suffer the greatest utility loss from fees and enjoy the greatest utility gain from being able to file for bankruptcy. Our results thus support the argument made by Mann and Porter (2010) that a reduction in legal fees would be welfare enhancing.[32]

However, we temper this conclusion with several caveats. High fees may prevent two forms of moral hazard. First, fees may inhibit households from borrowing excessively. Second, fees may deter bankruptcy, holding borrowing constant. Both of these forms of moral hazard must be balanced against the benefits of reducing fees. To the extent that liquidity-constrained filers impose larger moral hazard costs than the average filer, then filing fees may be effective in reducing moral hazard costs overall. An important task in future work will be quantifying the moral hazard costs associated with reducing entrance fees to bankruptcy.

7 Conclusion

We find that tax rebates cause a significant, short-run increase in consumer bankruptcies. This evidence is consistent with the hypothesis that the legal fees associated with bankruptcy force liquidity-constrained households to delay filing. These results highlight the importance of liquidity constraints in the optimal design of the consumer bankruptcy system.

An important area of future work is the consumption-smoothing benefits of bankruptcy.

[32]Mann and Porter (2010) argue that congress can lower the amount of paperwork required for bankruptcy, which in turn, would lower legal fees. They propose an expedited form of bankruptcy for low-asset filers.

This is an improtant parameter in any comprehensive welfare analysis of the bankruptcy system. Such research will shed light on the extent to which rebate-induced bankruptcies provide effective economic stimulus. Our evidence suggests that tax rebates allow some households to avoid a delay in filing for bankruptcy. If these households substantially increase consumption following the discharge of their debts, then this may imply that the timely discharge of household debt is an important component of economic stimulus policies.

Lastly, the concept that liquidity constraints affect the utilization (or take-up) of social insurance likely extends beyond consumer bankruptcy. Previous work has found that liquidity constraints are an important determinant of the behavioral response to unemployment insurance (Chetty, 2008), and we suspect that the decision to utilize unemployment insurance at all is also affected by liquidity constraints. Similarly, we suspect that the waiting periods for disability insurance interact with liquidity constraints in determining utilization. Thus, we believe a promising area for future research involves estimating the effect of liquidity constraints on the take-up of a broad range of social insurance programs.

References

Agarwal, S., C. Liu, and N. Souleles (2007). The Reaction of Consumer Spending and Debt to Tax Rebates-Evidence from Consumer Credit Data. *Journal of Political Economy 115*(6), 986–1019.

Bertrand, M. and A. Morse (2009, May). What do high-interest borrowers do with their tax rebate? *American Economic Review Papers and Proceedings*.

Chetty, R. (2008). Moral hazard versus liquidity and optimal unemployment insurance. *The Journal of Political Economy 116*(2), 173–234.

Dynarski, S. (2003). Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion. *The American Economic Review*.

Evans, W. N. and T. J. Moore (2011, June). The Short-Term mortality consequences of income receipt. *Journal of Public Economics*.

Fay, S., E. Hurst, and M. White (2002, June). The household bankruptcy decision. *American Economic Review 92*(3), 706–718.

Filer, L. H. and J. D. Fisher (2005). The consumption effects associated with filing for personal bankruptcy. *Southern Economic Journal 71*(4), 837–854.

Gropp, R., J. K. Scholz, and M. J. White (1997). Personal bankruptcy and credit supply and demand. *The Quarterly Journal of Economics 112*(1), 217–251.

Gross, T. and J. Tobacman (2011, January). Income shocks and the demand for health care: Evidence from the 2008 stimulus payments. Unpublished.

Hansen, G. D. and A. İmrohoroğlu (1992). The role of unemployment insurance in an economy with liquidity constraints and moral hazard. *The Journal of Political Economy 100*(1), 118–142.

Hsieh, C. (2003). Do consumers react to anticipated income changes? Evidence from the Alaska permanent fund. *The American Economic Review 93*(1), 397–405.

Hurst, E. and A. Lusardi (2004). Liquidity constraints, household wealth, and entrepreneurship. *Journal of Political Economy*, 319–347.

Johnson, D., J. Parker, and N. Souleles (2006). Household expenditure and the income tax rebates of 2001. *The American Economic Review 96*(5), 1589–1610.

Mahoney, N. (2010, December). Bankruptcy as implicit health insurance. Mimeo, Stanford University.

Mann, R. and K. Porter (2010). Saving up for Bankruptcy. *Georgetown Law Journal 98*, 289–290.

McIntyre, F., D. Sullivan, and T. Layton (2010, January). Did BAPCPA Deter the Wealthy? The 2005 Bankruptcy Reform's Effect on Filings Across the Income and Asset Distribution. Unpublished.

Mian, A., K. Rao, and A. Sufi (2011, November). Household balance sheets, consumption, and the economic slump.

Mian, A. and A. Sufi (2009). The consequences of mortgage credit expansion: Evidence from the us mortgage default crisis. *The Quarterly Journal of Economics 124*(4), 1449–1496.

Nichols, A. L. and R. J. Zeckhauser (1982). Targeting transfers through restrictions on recipients. *The American Economic Review 72*(2), 372–377.

Parker, J. A., N. S. Souleles, D. S. Johnson, and R. McClelland (2010). Consumer spending and the economic stimulus payments of 2008. *Unpublished paper, Northwestern University*.

Shapiro, M. and J. Slemrod (2003). Did the 2001 Tax Rebate Stimulate Spending? Evidence from Taxpayer Surveys. *Tax Policy and the Economy 17*, 83–109.

Souleles, N. (1999). The Response of Household Consumption to Income Tax Refunds. *The American Economic Review 89*(4), 947–958.

Stavins, J. (2000, July/August). Credit card borrowing, deliquency, and personal bankruptcy. *New England Economic Review*, 15–30.

Stephens, M. (2003). "3^{rd} of the Month": Do Social Security Recipients Smooth Consumption Between Checks? *The American Economic Review 93*(1), 406–422.

GAO (2008, June). Bankruptcy reform: Dollar costs associated with the bankruptcy abuse prevention and consumer protection act of 2005. Report to Congressional Requesters GAO-08-697, United States Government Accountability Office.

Wang, H.-J. and M. White (2000, January). An optimal personal bankruptcy procedure and proposed reforms. *Journal of Legal Studies 29*, 255–286.

Zhu, N. (2011). Household consumption and personal bankruptcy. *The Journal of Legal Studies 40*(1), 1–37.

Zywicki, T. J. (2005). An economic analysis of the consumer bankruptcy crisis. *Northwestern University Law Review 99*(4), 1463–1542.

Figure 1: Bankruptcy Districts in Sample

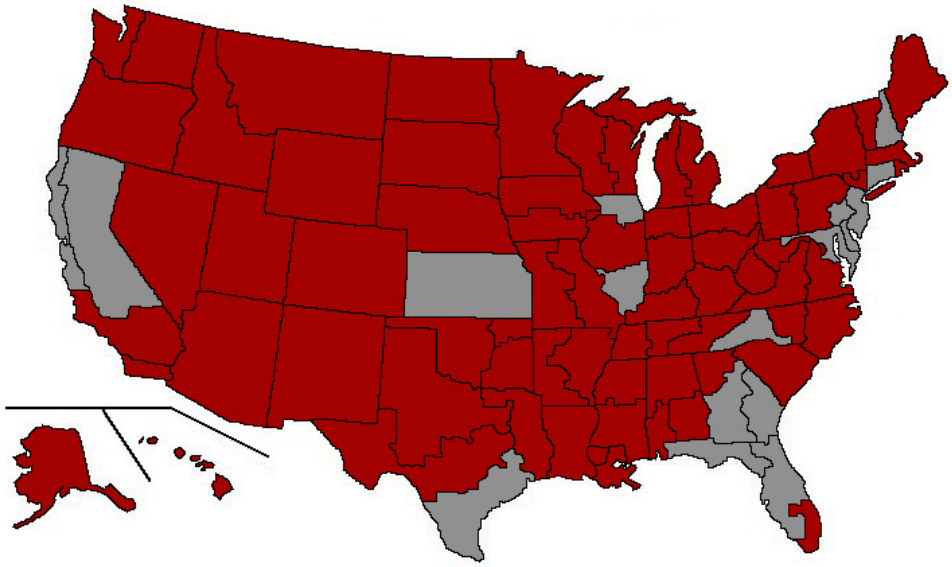
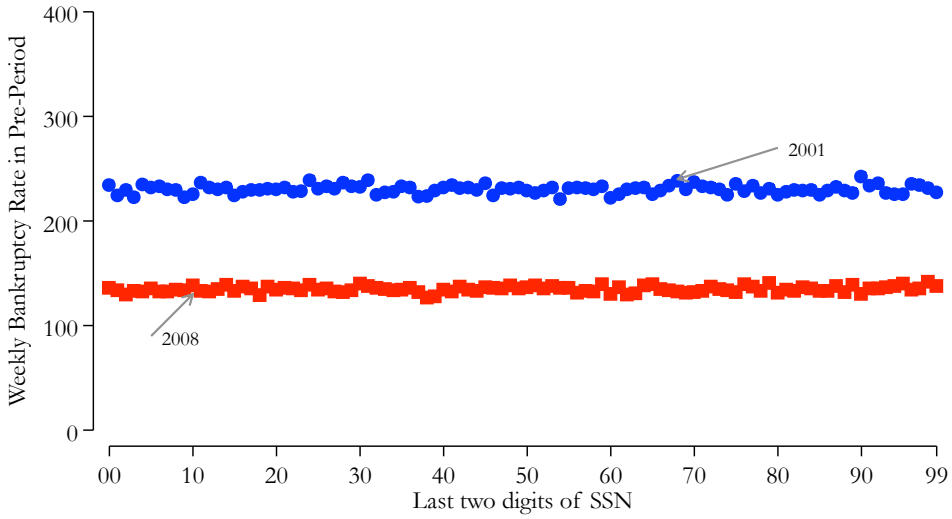


Figure 2. Randomization Test



This graph plots bankruptcies in March, April, and May of 2001 and in January, February, and March of 2008. The distribution of the 2001 tax rebates began in July, and the distribution of the 2008 tax rebates began in May. An F-test fails to reject the hypothesis that weekly bankruptcy rates are equal across groups with p-value 0.726 in 2001 and 0.864 in 2008.

Figure 3. Types of Households

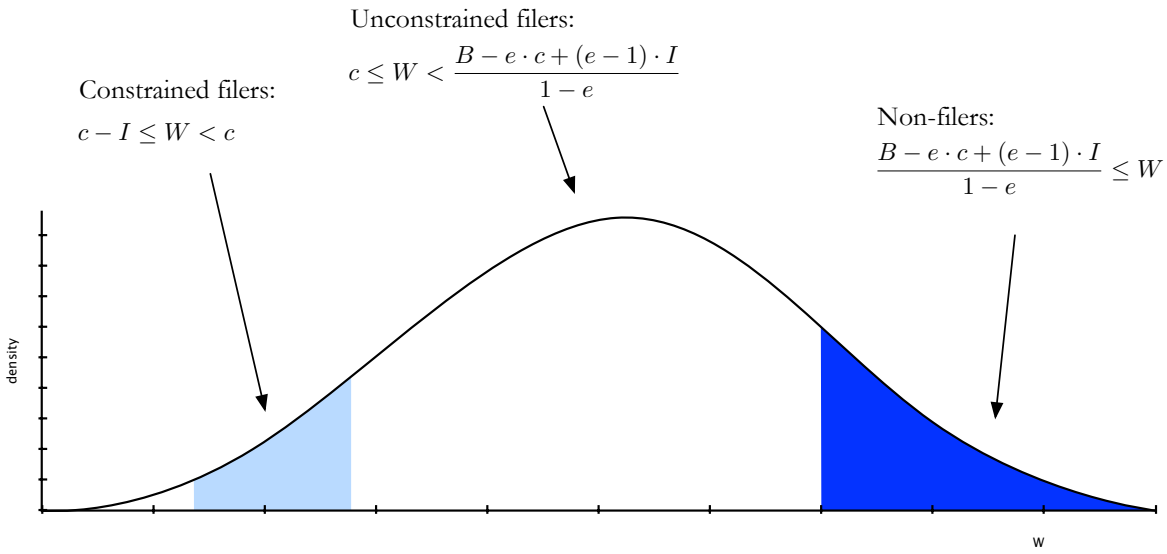
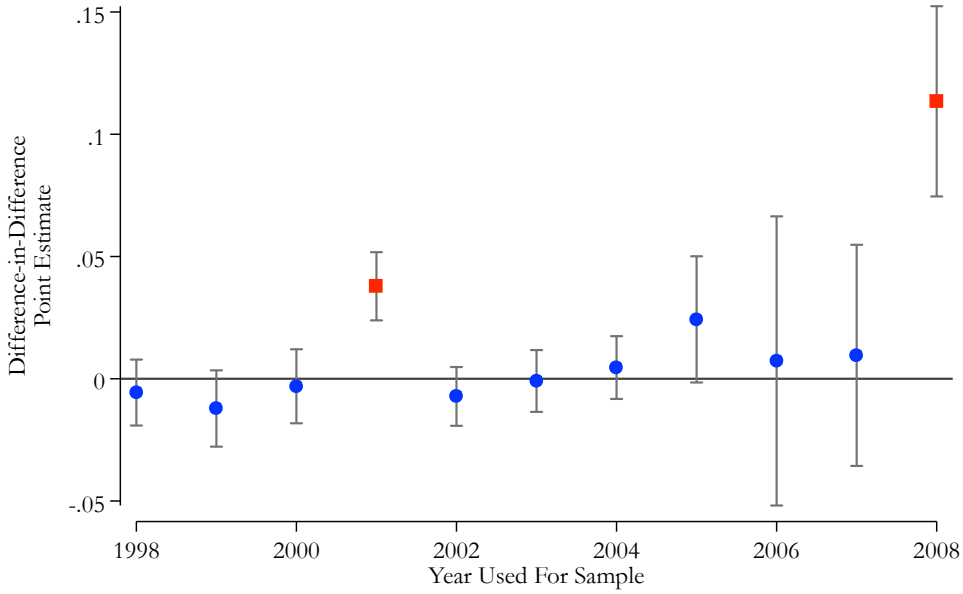
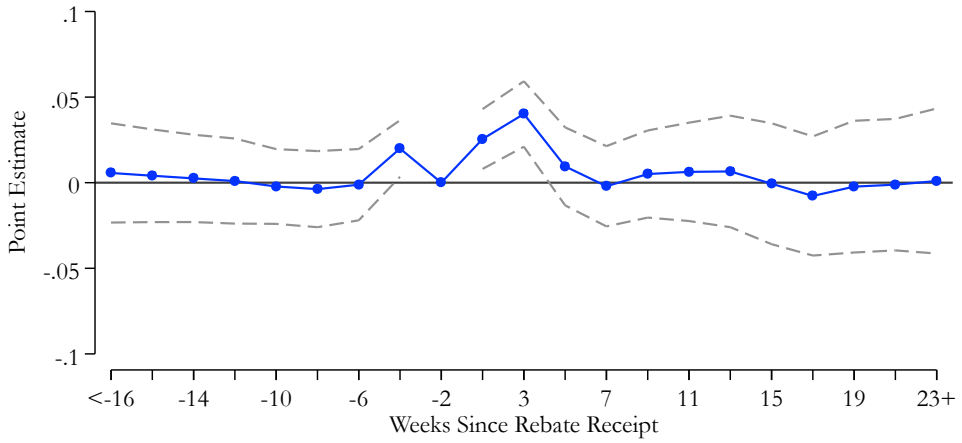


Figure 4. Chapter 7 Rebate Effect by Year



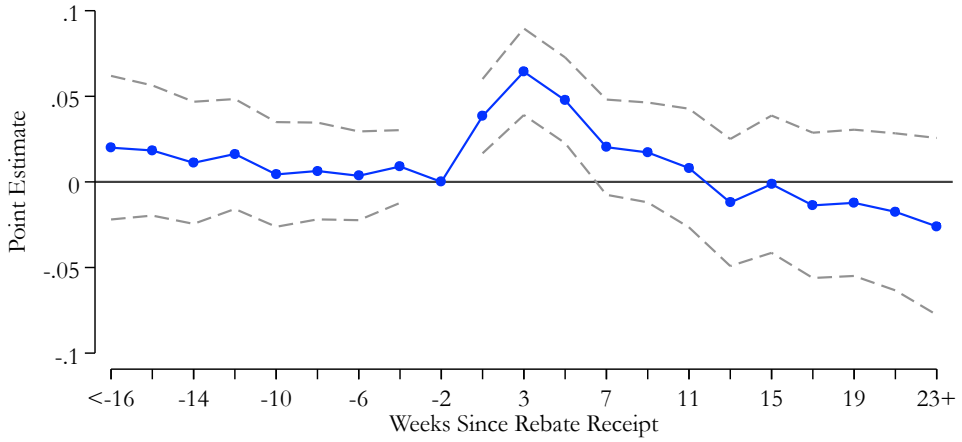
Note: Tax rebates were sent in 2001 and 2008.

Figure 5. Event Study Point Estimates, 2001
Dependent Variable: Log of Chapter 7 Filings



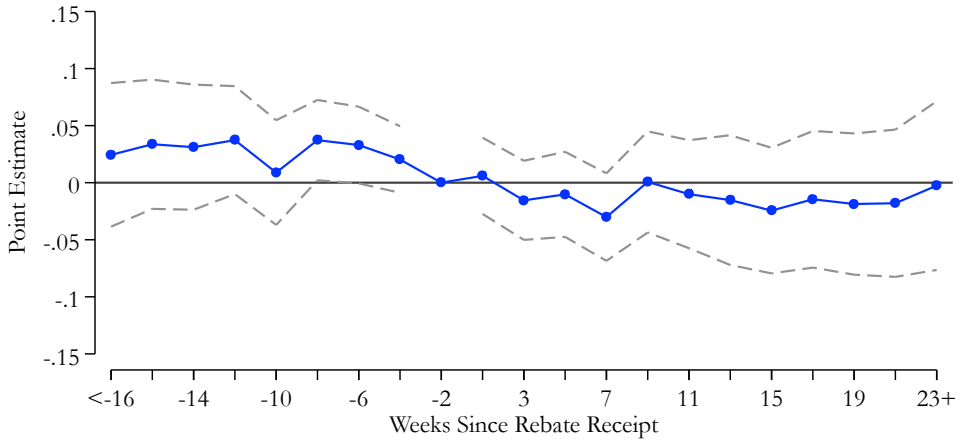
The figure presents point estimates from a regression of log counts of bankruptcies on indicators for two-week intervals. The dotted lines represent 95% confidence intervals that are robust to autocorrelation between observations from the same SSN group. The sample consists of bankruptcies by SSN group and week, covering 30 weeks before and 40 weeks after groups were sent their tax rebate checks. SSN-group fixed effects and week fixed effects not shown. The omitted time period is 1 and 2 weeks before rebate checks were sent.

Figure 6. Event Study Point Estimates, 2008
Dependent Variable: Log of Chapter 7 Filings



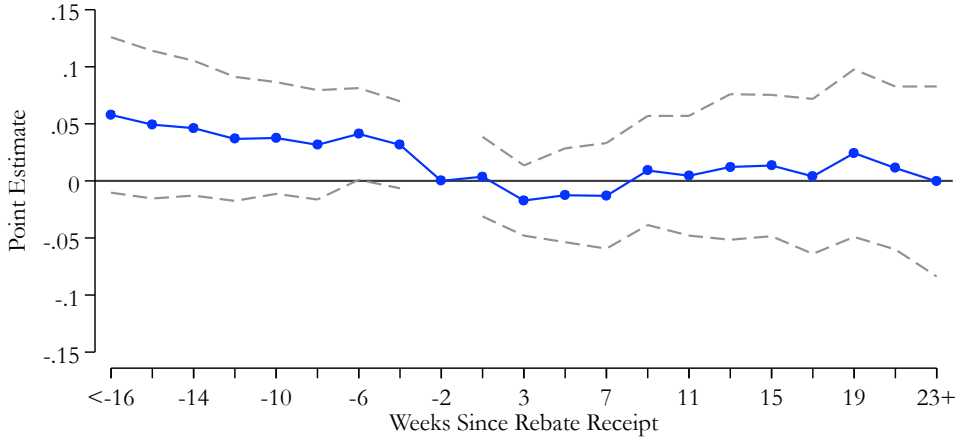
The figure presents point estimates from a regression of log counts of bankruptcies on indicators for two-week intervals. The dotted lines represent 95% confidence intervals that are robust to autocorrelation between observations from the same SSN group. The sample consists of bankruptcies by SSN group and week, covering 30 weeks before and 40 weeks after groups were sent their tax rebate checks. SSN-group fixed effects and week fixed effects not shown. The omitted time period is 1 and 2 weeks before rebate checks were sent.

Figure 7. Event Study Point Estimates, 2001
Dependent Variable: Log of Chapter 13 Filings



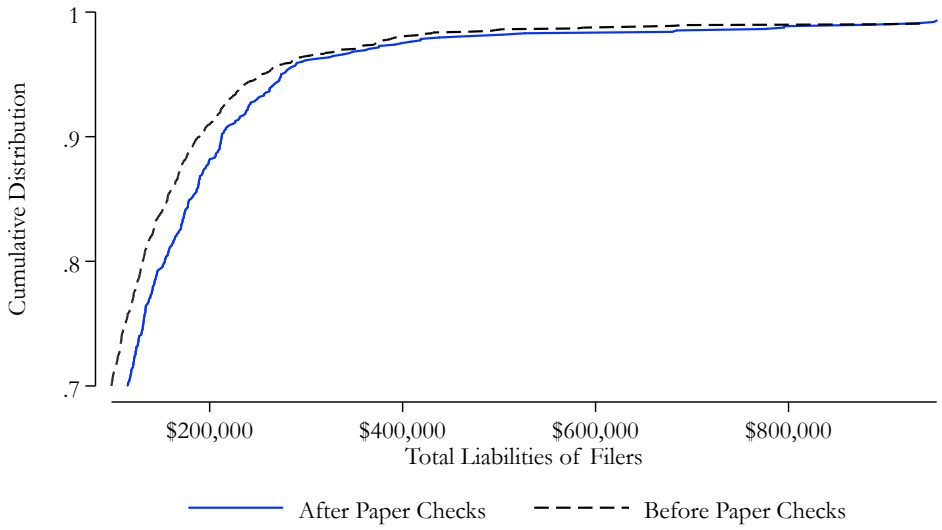
The figure presents point estimates from a regression of log counts of bankruptcies on indicators for two-week intervals. The dotted lines represent 95% confidence intervals that are robust to autocorrelation between observations from the same SSN group. The sample consists of bankruptcies by SSN group and week, covering 30 weeks before and 40 weeks after groups were sent their tax rebate checks. SSN-group fixed effects and week fixed effects not shown. The omitted time period is 1 and 2 weeks before rebate checks were sent.

Figure 8. Event Study Point Estimates, 2008
Dependent Variable: Log of Chapter 13 Filings



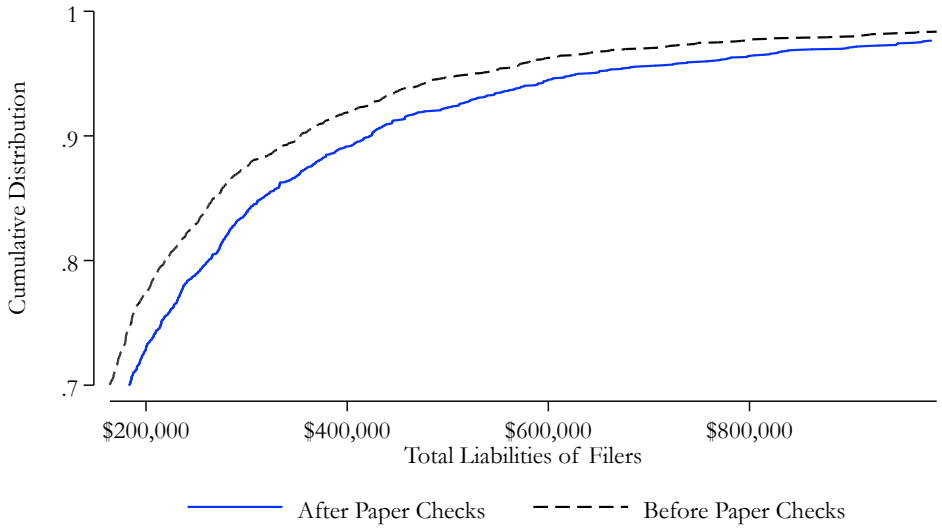
The figure presents point estimates from a regression of log counts of bankruptcies on indicators for two-week intervals. The dotted lines represent 95% confidence intervals that are robust to autocorrelation between observations from the same SSN group. The sample consists of bankruptcies by SSN group and week, covering 30 weeks before and 40 weeks after groups were sent their tax rebate checks. SSN-group fixed effects and week fixed effects not shown. The omitted time period is 1 and 2 weeks before rebate checks were sent.

Figure 9: Filers' Liabilities Before and After the Rebates, 2001



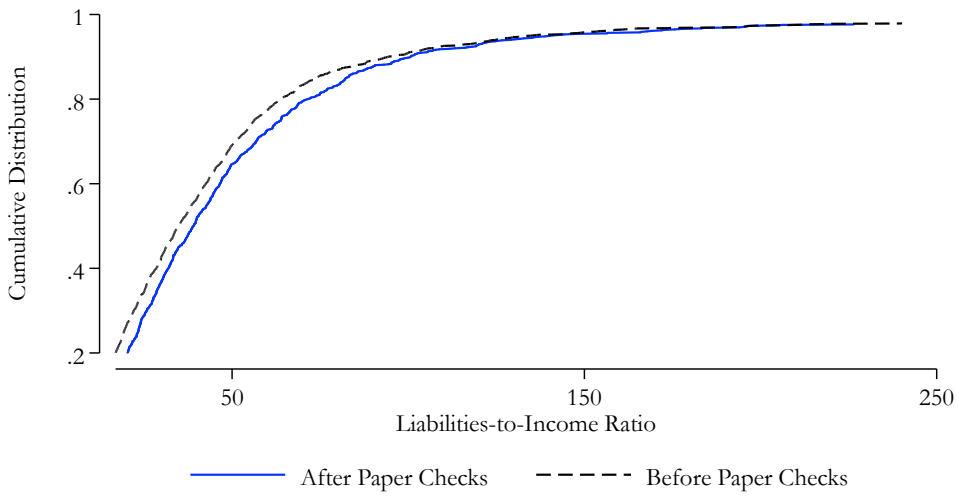
The figure presents the empirical cumulative distribution function based on a random sample of Chapter 7 bankruptcies in 2001. A Kolmogorov-Smirnov test of the null hypothesis that the two distributions are equal leads to a p-value of 0.001.

Figure 10: Filers' Liabilities Before and After the Rebates, 2008



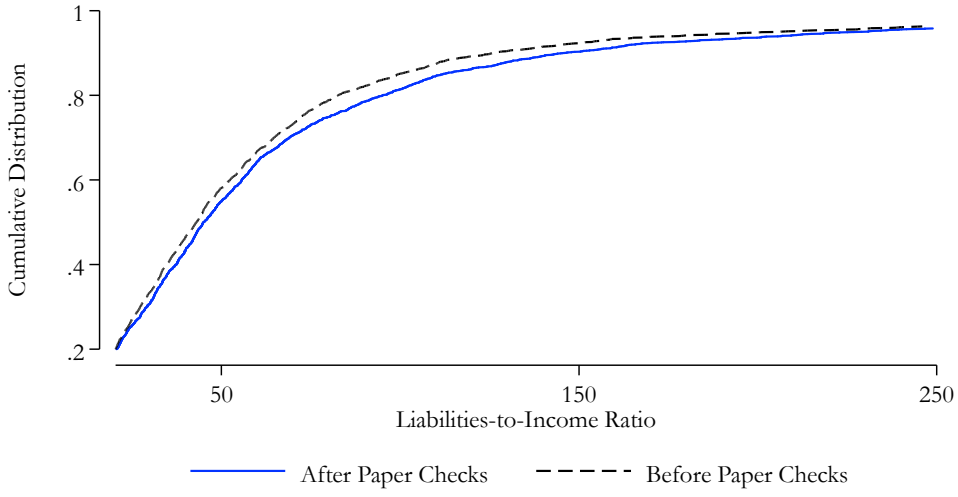
The figure presents the empirical cumulative distribution function based on a random sample of Chapter 7 bankruptcies in 2008. A Kolmogorov-Smirnov test of the null hypothesis that the two distributions are equal leads to a p-value of 0.001.

Figure 11: Filers' Liabilities-to-Income Ratio Before and After the Rebates, 2001



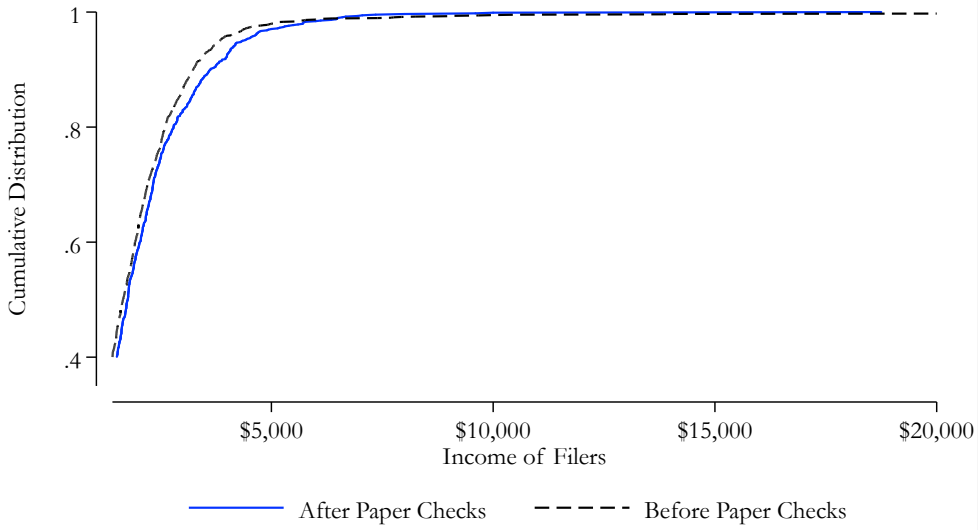
The figure presents the empirical cumulative distribution function based on a random sample of Chapter 7 bankruptcies in 2001. A Kolmogorov-Smirnov test of the null hypothesis that the two distributions are equal leads to a p-value of 0.004.

Figure 12: Filers' Liabilities-to-Income Ratio Before and After the Rebates, 2008



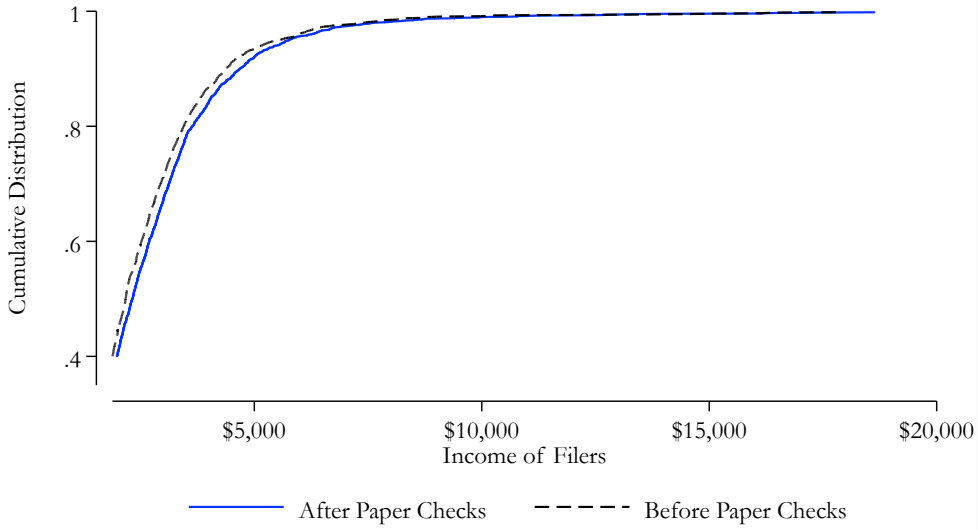
The figure presents the empirical cumulative distribution function based on a random sample of Chapter 7 bankruptcies in 2008. A Kolmogorov-Smirnov test of the null hypothesis that the two distributions are equal leads to a p-value of 0.015.

Figure 13: Filers' Income Before and After the Rebates, 2001



The figure presents the empirical cumulative distribution function based on a random sample of Chapter 7 bankruptcies in 2001. A Kolmogorov-Smirnov test of the null hypothesis that the two distributions are equal leads to a p-value of 0.097.

Figure 14: Filers' Income Before and After the Rebates, 2008



The figure presents the empirical cumulative distribution function based on a random sample of Chapter 7 bankruptcies in 2008. A Kolmogorov-Smirnov test of the null hypothesis that the two distributions are equal leads to a p-value of 0.002.

Table 1: Sample Coverage

	Districts in sample	Districts not in sample	All Districts	Coverage in our sample
		A. 2001 Sample		
Consumer bankruptcies	259,961	90,020	349,981	74%
Chapter 7	186,229	58,484	244,713	76%
Chapter 13	73,613	31,487	105,100	70%
Population	201,904,852	75,112,770	277,017,622	73%
Median Family Income	40,990	48,139	42,497	
Unemployment Rate	4.70%	4.86%	4.75%	
Percent College	23.9%	27.4%	25.5%	
Median Housing Value	117,012	151,670	124,076	
		B. 2008 Sample		
Consumer bankruptcies	272,182	90,559	362,741	75%
Chapter 7	183,788	58,740	242,528	76%
Chapter 13	88,208	31,706	119,914	74%
Total population	222,045,717	54,971,905	304,059,728	73%
Median Family Income	50,169	61,021	50,861	
Unemployment Rate	5.69%	6.06%	5.79%	
Percent College	27.0%	29.4%	27.7%	
Median Housing Value	210,302	306,000	214,900	

Note: This table describes the characteristics of the bankruptcy districts in our sample. See text for details.

Table 2. Dates When Rebate Checks Were Sent

Last 2 Digits of SSN's	2001 Rebate Check Sent	Last 2 Digits of SSN's	2008 Stimulus Check Sent	Last 2 Digits of SSN's	2008 Stimulus Deposit Made
00 – 09	July 20	00 – 09	May 16	00 – 20	May 2
10 – 19	July 27	10 – 18	May 23	21 – 75	May 9
20 – 29	August 3	19 – 25	May 30	76 – 99	May 16
30 – 39	August 10	26 – 38	June 6		
40 – 49	August 17	39 – 51	June 13		
50 – 59	August 24	52 – 63	June 20		
60 – 69	August 31	64 – 75	June 27		
70 – 79	September 7	76 – 87	July 4		
80 – 89	September 14	88 – 99	July 11		
90 – 99	September 21				

Note: This table describes the dates on which the Internal Revenue Service sent tax rebate payments. The timing of when payments were sent was determined by the last two digits of the head-of-household's social security number.

Table 3: The Effect of Rebate Checks on Bankruptcies
Dependent Variable: Level or logarithm of total bankruptcy filings
per SSN group per week

	(1)	(2)	(3)	(4)	(5)	(6)
	Chapter 7		Chapter 13		All	
	Levels	Logs	Levels	Logs	Levels	Logs
			A. 2001 Tax Rebates			
After	5.640	0.038	- 1.160	- 0.024	4.480	0.023
Check	(1.024)	(0.007)	(0.564)	(0.011)	(1.116)	(0.006)
Sent	[0.000]	[0.000]	[0.042]	[0.030]	[0.000]	[0.000]
R^2	0.776	0.787	0.473	0.473	0.771	0.791
			B. 2008 Tax Rebates			
After	5.445	0.051	- 0.471	- 0.011	4.974	0.033
Check	(0.948)	(0.009)	(0.535)	(0.012)	(1.039)	(0.007)
Sent	[0.000]	[0.000]	[0.380]	[0.361]	[0.000]	[0.000]
After	6.388	0.062	- 1.538	- 0.037	4.850	0.035
Direct	(1.695)	(0.017)	(0.889)	(0.023)	(1.817)	(0.013)
Deposit	[0.000]	[0.000]	[0.087]	[0.105]	[0.009]	[0.009]
Total	11.834	0.113	- 2.009	- 0.048	9.824	0.068
Effect	(1.973)	(0.020)	(1.092)	(0.027)	(2.161)	(0.016)
	[0.000]	[0.000]	[0.069]	[0.079]	[0.000]	[0.000]
R^2	0.865	0.860	0.559	0.568	0.868	0.866

Note: N = 7,100. The sample consists of counts of bankruptcies by two-digit SSN group and week, covering 30 weeks before and 40 weeks after groups were sent their tax rebate checks. The standard errors in parentheses are robust to autocorrelation between observations from the same SSN group. The associated p-values are in brackets. SSN-group fixed effects and week fixed effects not shown.

Table 4: The Effect of Rebate Checks by Local Characteristics
Dependent Variable: logarithm of chapter 7 bankruptcy filings per SSN group per

	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
	Bankruptcies stratified by median family income in zip code			Bankruptcies stratified by share of zip code residents who are sub-prime borrowers		
	First Tercile	Second Tercile	Third Tercile	First Tercile	Second Tercile	Third Tercile
			A. 2001 Tax Rebates			
After	0.048	0.026	0.045	0.044	0.052	0.019
Check	(0.011)	(0.012)	(0.015)	(0.013)	(0.011)	(0.011)
Sent	[0.000]	[0.032]	[0.003]	[0.002]	[0.000]	[0.105]
R^2	0.585	0.599	0.465	0.512	0.595	0.555
			B. 2008 Tax Rebates			
After	0.053	0.054	0.050	0.049	0.058	0.046
Check	(0.016)	(0.015)	(0.014)	(0.016)	(0.014)	(0.017)
Sent	[0.002]	[0.000]	[0.000]	[0.003]	[0.000]	[0.009]
After	0.005	0.085	0.076	0.075	0.058	0.047
Direct	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.035)
Deposit	[0.863]	[0.006]	[0.012]	[0.016]	[0.057]	[0.176]
Total	0.058	0.139	0.126	0.075	0.058	0.047
Effect	(0.035)	(0.034)	(0.035)	(0.030)	(0.030)	(0.035)
	[0.098]	[0.000]	[0.001]	[0.016]	[0.057]	[0.176]
R^2	0.616	0.702	0.658	0.648	0.702	0.632

Note: N = 7,100. The sample consists of counts of bankruptcies by two-digit SSN group and week, covering 30 weeks before and 40 weeks after groups were sent their tax rebate checks. The standard errors in parentheses are robust to autocorrelation between observations from the same SSN group. The associated p-values are in brackets. SSN group fixed effects and week fixed effects not shown.

Table 5: Summary Statistics for Filings from Ten Districts

	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
		A. 2001			B. 2008	
Household Composition						
Female	24%			25%		
Single	35%			34%		
Separated or Divorced	16%			20%		
Married	49%			46%		
Number of children	1.04	1	1.20	0.92	0	1.20
Fees						
Filing fee	$199	$200	$15	$299	$299	$0
Legal fee promised	$746	$700	$397	$1,265	$1,099	$654
Legal fee % paid	79%	100%	30%	86%	100%	30%
Self-representation	3.4%			1.8%		
Financial Characteristics						
Monthly income	$2,048	$1,748	$2,053	$2,693	$2,284	$2,136
Monthly expenses	$2,351	$1,976	$4,526	$2,989	$2,540	$2,389
Total assets	$70,923	$31,883	$310,346	$112,259	$55,074	$440,894
Total liabilities	$136,541	$62,896	$1,021,721	$181,823	$101,943	$392,214
% of liabilities secured	42%	46%	30%	42%	44%	30%
Liabilities-to-income ratio	72	36.8	430.4	76.4	43.8	187

Note: This table presents statistics for a sample of chapter 7 bankruptcies from 10 bankruptcy districts. The sample consists of 2,132 bankruptcies in 2001 and 4,355 bankruptcies in 2008. See text for details on how the sample was constructed.

Appendix Table A1: The Long-Run Effect of the 2001 Rebates
Dependent Variable: Log of chapter 7 bankruptcies by month

	(1)	(2)	(3)	(4)
After 2001	0.000	- 0.004	- 0.017	0.006
Tax Rebates	(0.039)	(0.050)	(0.050)	(0.030)
	[1.000]	[0.937]	[0.743]	[0.844]
R^2	0.660	0.661	0.666	0.908
N	84	84	84	84
Cubic polynomial in time	X			
Quartic polynomial in time		X		
Quintic polynomial in time			X	X
Month fixed effects				X

Note: This table reports results from a regression of log bankruptcies on a dummy for the period between June, 2001 and March, 2002 (inclusive). This captures two months before the 2001 tax rebate and six months afterwards. The sample includes the months between January, 1998 and December, 2004 (inclusive), and the unit of observation is month-year. The time polynomials are functions of the number of months since the start of the sample period, and are intended to capture long-run trends in bankruptcy filings. Heteroskedasticity-robust standard errors are in parentheses, and p-values are in brackets.

Appendix Table A2: The Effect of the Tax Rebates on Characteristics of the Filers

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	Log of Liabilities	Log of Liabilities-to-Income Ratio	Log of Income	Log of Liabilities	Log of Liabilities-to-Income Ratio	Log of Income
			A. 2001 Tax Rebates			
After Check Sent	0.155	0.111	0.044	0.318	0.260	0.059
	(0.045)	(0.039)	(0.028)	(0.107)	(0.084)	(0.059)
	[0.001]	[0.005]	[0.119]	[0.003]	[0.002]	[0.317]
R^2	0.105	0.084	0.100	0.126	0.108	0.127
			B. 2008 Tax Rebates			
After Check Sent	- 0.020	0.020	- 0.041	- 0.103	- 0.080	- 0.023
	(0.053)	(0.042)	(0.030)	(0.078)	(0.066)	(0.045)
	[0.702]	[0.630]	[0.175]	[0.186]	[0.228]	[0.601]
After Direct Deposit	0.107	0.025	0.082	0.151	0.059	0.092
	(0.054)	(0.043)	(0.031)	(0.210)	(0.149)	(0.151)
	[0.048]	[0.566]	[0.009]	[0.472]	[0.693]	[0.541]
Total Effect	0.086	0.045	0.041	0.048	- 0.021	0.069
	(0.032)	(0.029)	(0.021)	(0.227)	(0.167)	(0.160)
	[0.007]	[0.126]	[0.046]	[0.832]	[0.901]	[0.667]
R^2	0.156	0.104	0.080	0.170	0.118	0.091
Fixed Effects						
SSN group FEs	Y	Y	Y	Y	Y	Y
Office FEs	Y	Y	Y	Y	Y	Y
Week FEs	N	N	N	Y	Y	Y

Note: The sample consists of Chapter 7 filings randomly selected from ten court districts: 2,132 bankruptcies in 2001 and 4,355 bankruptcies in 2008. The standard errors in parentheses are robust to autocorrelation between observations from same SSN group, and associated p-values are in brackets.