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HOW DO EXOGENOUS SHOCKS CAUSE BANKRUPTCY?
BALANCE SHEET AND INCOME STATEMENT CHANNELS

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ABSTRACT

We are the first to examine whether exogenous shocks cause personal bankruptcy through the balance sheet channel and/or the income statement channel. For identification, we examine the effect of exogenous, politically motivated government payments on 200,000 Canadian bankruptcy filings. We find support for the balance sheet channel, in that receipt of the exogenous cash increases the net balance sheet benefits of bankruptcy (unsecured debt discharged minus liquidated assets forgone) required by filers. We also find limited support for the income statement channel, in that exogenous payments reduce bankruptcy filings from individuals whose current expenses exceed their current income.

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1. Introduction

An important difference between the literatures on corporate finance and household finance is the widespread availability of balance sheet and income statement data for firms but not for households. Thus, while a vast literature on corporate finance has shown that the balance sheet and income statement characteristics of a firm influence its financial decisions, similar research for household financial decisions is rare.

This paper examines the link between a household's balance sheet and income statement characteristics and its financial decisions by exploiting one of the few instances when a household is required by law to publically divulge its full balance sheet and full income statement: the moment when a household files for personal bankruptcy. Specifically, this paper tests the hypothesis that a household's balance sheet and income statement characteristics will affect whether the household responds to an exogenous shock by making the financial decision to file for personal bankruptcy.

The exogenous shock hypothesis for personal bankruptcy has long been at the center of much discussion of personal bankruptcy (e.g., Fay, Hurst, and White, 2002; Gross and Souleles, 2002; White, 2011; and many others). The standard version of this hypothesis states that a positive shock (e.g., unexpectedly receiving a cash payment) should lead to a reduction in bankruptcy filings because individuals would use that payment to avoid bankruptcy. Similarly, a negative shock (e.g., unexpected job loss, health shock, divorce) should lead to an increase in bankruptcy filings because individuals would have a greater need for bankruptcy protection. The contribution of this paper is to provide the first evidence that the full balance sheet and income statement characteristics of individuals will influence how they respond to exogenous shocks.

Recent empirical research has attempted to test the exogenous shock hypothesis by exploiting plausibly exogenous shocks received by some but not other individuals (i.e., treatment and control groups) and examining the resulting effect on total counts of bankruptcy filings. Gross and Notowidigdo (2011) examine exogenous increases in US state-level Medicaid coverage and find evidence to support the standard income shock hypothesis: that a positive shock reduces bankruptcies. Hankins, Hoekstra, and Skiba (2011) examine the random differences of small and large lottery winnings on bankruptcy and conclude that winning the lottery does not reduce, but only postpones, bankruptcy, which is inconsistent with the standard

exogenous shock hypothesis. Gross, Notowidigdo, and Wang (2013) examine the randomized timing of U.S. tax rebate payments on bankruptcy and find that receipt of these payments actually causes increased bankruptcies, which is the opposite of what would be predicted by the standard exogenous shock hypothesis. Morrison, et al. (2013) examine the effect of severe and minor car crashes (as a proxy for health shocks) on bankruptcy, but they conclude there is no causal relationship between car crashes and bankruptcy.

While the main focus of much of the existing empirical literature has therefore been on examining how exogenous shocks affect total counts of bankruptcy filings, the focus in this paper is on how *heterogeneity* in individual balance sheet and income statement characteristics across individuals affects the bankruptcy response to exogenous shocks. By examining balance sheet and income statement characteristics of filers, we aim to provide new evidence on the various possible channels by which an exogenous shock influences an individual's bankruptcy filing decision.

We first replicate the literature by showing that an exogenous cash payment reduces the total count of bankruptcy filers. Our main new findings are that exogenous shocks strongly affect the bankruptcy filing decision through the balance sheet channel, but they have a weaker effect through the income statement channel. Furthermore, we are the first to show that the interaction of both income statement and balance sheet characteristics matters for explaining individual bankruptcy responses to exogenous shocks. The signs on all of our results are consistent with the standard income shock hypothesis (i.e., that a positive shock reduces bankruptcy).

Our methodology is to exploit a plausibly exogenous fiscal payment received by some but not other bankruptcy filers, while at the same time using a very large and unique new database containing the full balance sheet (all assets and all liabilities) and full income statement (all current income and all current expenses) of every bankruptcy e-filer in Canada. This database of more than 200,000 individual bankruptcy filings is provided to us by the Office of the Superintendent of Bankruptcy (OSB), which regulates all bankruptcies in Canada.

To the best of our knowledge, this is the only data set we are aware of in the literature to include both the full balance sheet as well as the full income statement of a very large number of bankruptcy filers. While our paper is the first to test whether exogenous shocks affect bankruptcy responses through the balance sheet channel and/or the income statement channel, our work builds on that of Hankins, Hoekstra, and Skiba (2011) and Gross, Notowidigdo, and Wang

(2013), who have recognized that the balance sheet and/or income statement characteristics of bankruptcy filers may affect their response to exogenous shocks. These authors, however, have been unable to formally test the hypotheses developed here, largely because of administrative constraints in collecting from the U.S. bankruptcy courts full balance sheet and full income statement data for a large number of bankruptcy filers.

For exogenous variation, we exploit a politically motivated, one-time-only fiscal cash transfer paid to every resident of one Canadian province in one specific month but not to any other Canadians (the "Ralph bucks" payments to every resident of Alberta in January 2006, named after then Alberta Premier Ralph Klein). Approximately 10.5 percent of Canadians are resident in the Province of Alberta. The key to our identification strategy is that we can distinguish exactly which Canadian bankruptcy filers received the unexpected cash payment (bankruptcy filers resident in the Province of Alberta in 2006, our treatment group) and which Canadian bankruptcy filers did not (our control group), based on their province of residency at the time of their bankruptcy filing. We use a variety of mechanisms such as propensity score matching to construct our treatment and control groups.

Our new balance sheet channel hypothesis is specifically based on the different ways that different kinds of liabilities and assets are treated under bankruptcy law. Broadly speaking, under bankruptcy law, a bankruptcy filer benefits from the discharge of unsecured liabilities (e.g., credit card debt), but faces the cost of the loss of assets (e.g., real estate) that are liquidated and used to repay secured creditors (e.g., mortgage debt), net of provincial-level exemptions. The idea of the net balance sheet benefits of bankruptcy has played a central role in the bankruptcy literature (e.g., Fay, Hurst, and White, 2002). Because of the different ways that secured and unsecured liabilities are treated under bankruptcy law, we argue that it is not appropriate, for example, to examine how exogenous shocks affect aggregate balance sheet measures such as total liabilities. Our full balance sheet data, as well as data on provincial exemptions, allow us to calculate the specific dollar value of the net balance sheet benefits of bankruptcy for each filer in our database, using the same approach as Fay, Hurst, and White (2002).

We use these data to test our balance sheet channel hypothesis that the dollar magnitude of net balance sheet benefits from bankruptcy will affect the bankruptcy choice following exogenous shocks. We argue that individuals with relatively small net balance sheet benefits from bankruptcy may be persuaded, by receipt of the exogenous cash, not to file for bankruptcy.

On the other hand, we argue that individuals with high net benefits from bankruptcy are unlikely to be dissuaded from filing by the exogenous payment. Our testable hypothesis is thus that the exogenous cash payment will increase the average balance sheet benefit of filers. Our new evidence supports this hypothesis.

The role of income statement characteristics (i.e., the income statement channel) in the existing bankruptcy literature has focused on issues of illiquidity, which occurs when the individual is not able to meet current expenses from current income. The importance of our full income statement database, therefore, is that it allows us to measure monthly income net of monthly expenses as a measure of liquidity, rather than having to use measures such as annual income as a proxy for liquidity.

Opposing predictions have been proposed in this literature regarding the effect of illiquidity on bankruptcy and default decisions following an exogenous shock. The standard income shock argument (e.g., Elul et al., 2010) argues that illiquidity can *increase* the likelihood of default because the individual may "not be able to find the cash" to meet current expenses (Elul et al., 2010, p. 490). On the other hand, Gross, Notowidigdo, and Wang (2013) emphasize the payment frictions involved in bankruptcy filing and argue that illiquidity can *reduce* bankruptcy filings because illiquid individuals cannot afford to pay the bankruptcy filing fee. Our exogenous shock methodology and our full income statement data allow us to distinguish between these contradictory hypotheses. Our evidence is consistent with the standard argument.

While our data allow us to examine income statement (i.e., liquidity) and balance sheet (i.e., net balance sheet benefits) characteristics separately, they also allow us to explore the interaction between income statement and balance sheet characteristics of filers and how they combine to affect the response to the exogenous shock. We find that the exogenous payment reduces the number of filers with low financial benefits, but particularly those filers who are also illiquid (i.e., their current expenses are larger than current income). We are the first in the literature to draw this conclusion.

2. Institutional Background

2.1. Personal Bankruptcy in Canada

There are both similarities and differences between the personal bankruptcy systems in Canada and the United States. Bankruptcy in Canada is federally regulated by a single regulator,

the OSB, to which every bankruptcy filing must be made. This is very different from in the U.S., where there are 94 separate bankruptcy court districts to which bankruptcy filings are made. The single Canadian bankruptcy regulator is an important reason for our ability to access the large, Canada-wide database used in this paper. There are two types of personal insolvency in Canada: "bankruptcy," where the filer writes off unsecured debt in exchange for liquidating secured assets that are used to repay debts to creditors, and "proposal," which is a negotiated agreement with creditors to reduce or delay debt repayments without any liquidation of assets (these mechanisms are broadly similar to Chapter 7 and Chapter 13 bankruptcies in the U.S., respectively). The main section of this paper focuses only on Canadian bankruptcy, but we do use data on proposal counts as a falsification test.

Every bankruptcy filing in Canada has to be made to the OSB by a bankruptcy trustee to the OSB. The trustee is typically a professional accountant licensed by the OSB to act in bankruptcy filings. The trustee is considered an officer of the court and is designed to be impartial between creditors and debtors. The values of all balance sheet and income statement data used in this paper are determined by the trustee rather than by the individual bankruptcy filer, based on legal standards established by the OSB.

Ramsay (1999) shows that approximately 98 percent of all personal bankruptcies in Canada are filed under "summary administration," which is a highly automated process used for relatively simple and "routinized" files. These are the files in our database. Furthermore, Ramsay shows that in only 5 percent of individual bankruptcy cases do creditors object to the bankruptcy. In other words, for the overwhelming majority of individual bankruptcy filers in Canada, the individual debtor is not required to appear in court to face creditors.

An important institutional distinction between the bankruptcy processes in the U.S. and Canada may explain the difference between our Canadian results (we find that exogenous payments reduce bankruptcy) and the U.S. findings of Gross, Notowidigdo, and Wang (2013) (who find that exogenous payments increase bankruptcy). Gross, Notowidigdo, and Wang argue that their finding is due to liquidity-constrained individuals using the exogenous payment to pay filing fees. The key institutional detail is that, in Canada, bankruptcy filing fees can be paid over a nine-month period after the filing date, while U.S. filers must pay filing fees at the time of the filing. In other words, the filing fees constraint is less binding for bankruptcy filers in Canada.

2.2. The Exogenous Shock: The Alberta 2006 "Ralph Bucks" Cash Payment

We use as an exogenous shock the "Ralph bucks" payments made by the government of Alberta to every resident of Alberta, but not to other Canadians, in January 2006. The magnitude of the Alberta cash payment was C$400 for each and every resident of Alberta (including all adults and all children). Thus, a one-person household received C$400 and a four-person household received C$1,600. The magnitude of the fiscal cash transfers in this study is very similar to the magnitude of the exogenous fiscal cash transfers (U.S. tax rebates) examined by Gross, Notowidigdo, and Wang (2013) in their bankruptcy study, which typically fell between US$300 and US$1,200 per household.

There was much discussion in the Albertan popular press at the time that the motivation for this one-off payment was a "vote grab" designed to increase the political popularity of the then-Premier of Alberta, Ralph Klein. The politically motivated nature of these cash transfers is indicated by the fact that this kind of payment never occurred before (or since) in the recent history of Alberta. Because of the perceived political motivation for these one-off payments, Albertans almost universally referred to them as "Ralph bucks." We follow a variety of authors (e.g., Levitt, 1997) who argue that politically motivated actions of politicians are a good source of exogenous variation.

Based on data made available to us by the government of Alberta, 92.2 percent of these payment checks were delivered in January 2006; thus in our tests below, we use January 2006 as our "event month." The only Alberta residents not eligible for the payment were prison inmates. The transfer was exempt from taxes, and it did not alter eligibility for other government programs.

An important institutional detail concerns how this payment was dealt with by the Canadian bankruptcy regulator, the OSB. The OSB stated very explicitly that the Alberta 2006 cash payments were exempt from seizure in bankruptcy. Specifically, the OSB ruled that "the rebate amounts are exempt from execution or seizure, and cannot be assigned …. The rebates are considered property of the bankrupt that is *not* divisible amongst the creditors" (italics added). Therefore, the fiscal transfer did not affect either assets or liabilities of bankruptcy filers, and it was not considered part of the income that could be distributed to creditors. Hence, the transfer itself is not part of the balance sheet assets or income statements used in this paper.

3. Treatment and Control Groups

Our treatment group is defined as individuals who received the payment (i.e., filers resident in Alberta in 2006), and control groups are those that did not receive the payment (i.e., all other Canadian filers). We employ a variety of approaches to construct treatment and control groups. Our first approach is simply to include all 200,000 filers in our sample in either the treatment or control group, based on residency in Alberta during 2006. However, one possible concern with this approach is that our treatment group (in Alberta during 2006) may have systematically different characteristics from our control group (the rest of Canada). In order to account for this possibility, we also use propensity score matching developed by Heckman et al. (1997, 1998).

In order to generate a matched control group, we exploit the fact that we can observe the geographic location (six-digit postal code) of every filer in our database. There are approximately 13 households in each six-digit postal code. We can thus observe a very large number of census-level variables on the characteristics of the neighborhood of each filer—a geographic area known as the *dissemination area* (DA)—, which contains approximately 15 postal codes (i.e., approximately 200 households). The DA is the lowest geographic area at which census data is made available. We can thus generate a new (matched) control group based on matching each DA region in the treatment group with a matched DA region in the control group, based on the large number of census characteristics. We follow a standard procedure for propensity score matching in that we match DAs in Alberta during 2005 (the year preceding the disbursement of Ralph bucks) with DAs in the rest of Canada during 2005. In particular, we implement one-to-one nearest neighbor matching without replacement and without caliper. We use Logit to estimate the propensity score. As matching variables we use DA population, average DA income, standard error of DA income, annual change in CSD income, rural-urban index, past neighborhood bankruptcies, numerical literacy, proportions of divorced, separated and widowed, age and gender distributions, proportion of homeowners, and DA average levels of educational attainment.

Figures 1 and 2 plot data on bankruptcy counts per DA for the treatment group and the control group derived from the propensity score matching. Figure 1 shows that these two series have very similar trends over the period 2001–10. Figure 2 plots the difference in bankruptcies per DA between the treatment and control groups per year and shows horizontal lines reflecting

plus-and-minus 1 standard deviation of these differences. The key conclusion from Figure 2 is that, in all but one year, the difference between treatment and control groups is generally within the 1-standard-deviation bands. However, in 2006 the number of bankruptcies in Alberta is almost 2 standard deviations lower than the propensity score matched control group. This large negative spike for 2006 in Figure 2 is consistent with the proposition in this paper that the exogenous Ralph bucks payments to Albertans in 2006 reduced bankruptcy filings. We provide more formalized tests for this proposition below.

4. Testable Hypotheses

The main innovation in this paper is to test whether exogenous shocks affect the balance sheet and/or income statement characteristics of filers. Before conducting our main tests, however, we first replicate the tests conducted in the existing literature, which examine how an exogenous shock affects simple *counts* of bankruptcy filings.

We describe in detail in the following section the administrative bankruptcy data provided to us by the Canadian bankruptcy regulator, the Office of the Superintendent of Bankruptcy. In brief, the OSB provided us with two separate databases. The first includes a full count of every personal bankruptcy in Canada by year and six-digit postal code (we label this "count" data). This database does not, however, include details of individual bankruptcy filings. We use this database to test the hypothesis that the exogenous shock affects the count of bankruptcies across regions.

The second database includes all data from each individual filing, including full balance sheet and full income statement data as well as a large amount of demographic data provided by the bankruptcy trustee to the OSB at the time of filing. This database, however, includes only filings made electronically rather than by paper (we label this the "individual" data). We use this second individual-level database to test the hypothesis that exogenous shocks affect the balance sheet and/or income statement characteristics of individual filers.

4.1. Bankruptcy Counts

In order to test the hypothesis that the exogenous shock affects bankruptcy counts in a region, we use a dependent variable of total bankruptcy counts per annum per DA (which have on average 200 households), for every DA in Canada. Our main independent variable (Exogenous_Payment) reflects whether or not the cash payment was received (i.e., treatment or

control group). We include a large number of controls, described in the following.

$$Bankruptcy\_Count_{it} = \alpha + \delta Exogenous\_Payment_{it} + \beta Controls_{it} + \varepsilon_{it} . \quad (1)$$

A negative sign on the coefficient on the Exogenous_Payment term is consistent with the standard income shock hypothesis (i.e., that a positive shock, such as the Ralph-bucks payments, will reduce the count of bankruptcy filings), while a positive coefficient is consistent with the filing fees hypothesis (i.e., that a cash payment will allow individuals to afford bankruptcy filing fees and thus lead to an increase in bankruptcy counts).

In addition to annual counts of consumer bankruptcies per DA, the OSB database also includes counts of consumer proposals. These additional proposal-count data allow us to conduct a falsification test. Our falsification test exploits the legal distinctions in Canadian bankruptcy law between filing for bankruptcy (similar to U.S. Chapter 7) and filing a proposal to creditors (similar to U.S. Chapter 13). The key institutional detail is that a proposal to creditors is a negotiated agreement that requires the consent of creditors concerning the future stream of reduced and/or delayed payments to pay off outstanding debts. Unlike bankruptcy, a proposal does not entail the liquidation of assets to repay secured creditors. Thus, a successful proposal reflects the creditors' forward-looking expectation that the debtor will have the financial resources to repay the required amounts into the future, and in exchange, the creditors will not liquidate and claim secured assets. Because bankruptcy filers have fewer financial resources than proposal filers, we argue that the exogenous Ralph-bucks cash payment will be more likely to persuade bankruptcy filers with lower balance sheet benefits not to file. We can thus run a regression of the following form, where our prediction is that the coefficient on the Exogenous_Payment term should be insignificant on counts of proposals per DA:

$$Proposal\_Count_{it} = \alpha + \delta Exogenous\_Payment_{it} + \beta Controls_{it} + \varepsilon_{it} . \quad (2)$$

4.2. Individual Filer Characteristics: Balance Sheets and Income Statements

As previously described, both our balance sheet and income statement hypotheses build on work by Hankins, Hoekstra, and Skiba (2011) and Gross, Notowidigdo, and Wang (2013), who have also argued that exogenous shocks will affect the balance sheet and income statement characteristics of bankruptcy filers. However, these authors have not been able to develop and test the specific hypotheses examined here, because of constraints in collecting *full* balance sheet and full income statement data for a large number of bankruptcy filers from the U.S. bankruptcy

court system. For example, Gross, Notowidigdo, and Wang (2013) run regressions whose structure is similar to ours, in that their main independent variable is an exogenous shock and their dependent variables reflect individual filers' financial characteristics (in their case, either total liabilities, or total income, or their ratio). We argue, however, that our new dependent variables developed here more accurately reflect bankruptcy law and institutions.

4.2.1. The Balance Sheet Channel Hypothesis

Fay, Hurst, and White (2002) were the first to exploit the idea that, under bankruptcy law, individuals both receive benefits and incur costs from their bankruptcy, depending on the characteristics of their balance sheets. The main benefit from bankruptcy is that the individual is able to discharge all unsecured (e.g., credit card) debt. Thus, the larger the amount of unsecured debt held by the individual, the greater the benefit of the bankruptcy. On the other hand, under bankruptcy law, the individual turns over all assets above a provincial (or U.S. state) threshold to the bankruptcy trustee. The trustee then liquidates these assets and uses the proceeds to repay secured creditors. In other words, the larger the amount of assets available to pay off secured creditors, the greater the costs of the bankruptcy to the filer. A key implication of Fay, Hurst, and White (2002) is that, in the specific context of bankruptcy, it is not appropriate to examine aggregate balance sheet measures such as total liabilities, because of the very different ways in which different kinds of liabilities (specifically, unsecured and secured debt) are dealt with under bankruptcy law.

Our hypothesis argues that an exogenous payment will increase the average level of balance sheet benefits of those individuals who choose to file for bankruptcy even after receiving the payment. This hypothesis is based on the argument that individuals will choose to file for bankruptcy if and when they receive a certain level of balance sheet benefits from their bankruptcy (institutionally, under bankruptcy law, the choice of if and when to file is completely that of the individual). However, if individuals with relatively low balance sheet benefits from bankruptcy receive the exogenous cash payment, this cash payment may be enough to persuade them not to file. On the other hand, we hypothesize that it is unlikely individuals with relatively high balance sheet benefits from bankruptcy will be persuaded not to file, even after receipt of the cash payment. Taken together, our testable hypothesis is thus that receipt of the exogenous cash payment will increase the average balance sheet benefits (BSB) of filers. We thus run a

regression of the following form:

$$BSB_{it} = \alpha + \delta Exogenous\_Payment_{it} + \beta Controls_{it} + \varepsilon_{it} . \quad (3)$$

The coefficient on the Exogenous Payment variable (where treatment group = 1) in this regression will thus capture the effect of the income shock on the average BSB of treatment group filers who received the payment, compared with the average BSB of the control group filers who did not receive the payment. Our prediction is that there will be a positive coefficient on the Exogenous_Payment term, which implies that the average BSB of the treatment group filers who received the payment will be higher than the average BSB of the control group filers who did not receive the payment. The counterfactual is that the exogenous payment does not affect the decision to file, across all levels of BSB, in which case there should be no difference in the average level of BSB across treatment and control groups—i.e., the Exogenous_Payment term should be insignificant.

We argued above that a positive coefficient on Exogenous_Payment implies that receipt of the cash payment will persuade individuals with lower BSB not to file, but the cash payment will not change the filing decision of individuals with higher BSB. However, it is also mathematically possible that a positive coefficient (i.e., an increase in average BSB from filers receiving the payment) may be caused by an increase in the number of high-BSB filers, with no change in the number of low-BSB filers. One way of precluding this latter possibility is by examining the effect of the exogenous shock on the total counts of bankruptcy filers in the count regressions above. A finding that the cash payment reduces the *total count* of bankruptcy filers is not consistent with the possibility that an increase in average BSB by recipients of the cash payment is the result of an increase in the number of high-BSB filers. Our findings below indeed show that the cash payment reduces the total counts of filers.

4.2.2. The Income Statement Channel Hypothesis

Our *income statement channel* hypothesis builds on a variety of papers in the bankruptcy and default literature arguing that the level of liquidity can affect bankruptcy or default choices. While liquidity has been defined in many ways in the literature, because of our focus on the income statement channel we define liquidity as current monthly income minus current monthly expenses, which can be captured by the individual's current income statement.

As previously described, two competing hypotheses have been proposed in the literature

on how liquidity affects the bankruptcy and default choices of individuals in response to an exogenous payment shock. On the one hand, Gross, Notowidigdo, and Wang (2013) argue that liquidity constraints reduce bankruptcy filings because illiquid individuals cannot afford to pay bankruptcy filing fees. An exogenous cash payment should enable illiquid individuals to pay the bankruptcy filing fee, thus increasing the number of bankruptcies. On the other hand, authors such as Elul et al. (2010) argue that illiquidity should reduce the number of defaults (and bankruptcies) because individuals can use the exogenous cash payment to pay off current expenses (e.g., outstanding debt). The central distinction between these competing hypotheses concerns how the individual spends the exogenous cash payment. If the cash is used to pay bankruptcy filing fees, then this will increase the number of bankruptcies. But if the cash is used to pay current expenses, then this will decrease the number of bankruptcies.

Our data and methodology allow us to test these competing hypotheses by running a regression of the following form:

$$NetIncome_{it} = \alpha + \delta Exogenous\_Payment_{it} + \beta Controls_{it} + \varepsilon_{it}\ , \tag{4}$$

where net income is defined as current monthly income minus current monthly expenses as taken from the individual's full income statement. A positive coefficient on the Exogenous Payment term implies that, on average, bankruptcy filers who received the cash will have a higher level of net income compared to the control group of filers who did not receive the cash. Thus, the individuals who proceeded to file for bankruptcy in spite of receiving the cash payment will be individuals with higher net income. This in turn implies that individuals with lower levels of net income on average choose not to file for bankruptcy after receiving the cash transfer. One possible explanation for why individuals with lower net income choose not to file after receiving the cash is that they used the cash to pay off current expenses and thus avoid bankruptcy, as argued by the standard exogenous shock hypothesis (e.g., Elul et al., 2010).

Similarly, a negative coefficient implies that treated filers who receive the cash will have, on average, lower net income than control filers who do not receive the cash. One possible reason for why the cash payment induces more individuals with lower net income to file for bankruptcy is that the cash payment is used to pay the bankruptcy filing fee. A negative coefficient thus implies support for the bankruptcy filing fees argument of Gross, Notowidigdo, and Wang (2013), which suggests that cash payment to illiquid individuals will increase

bankruptcy filings because those individuals will use the cash to pay bankruptcy filing fees.

4.2.3. Interaction of Balance Sheet and Income Statement Channels

The two sections above have described how exogenous shocks may affect bankruptcy choices through the balance sheet channel and the income statement channel. It is also possible that *both* income statement as well as balance sheet characteristics interact to affect the response to exogenous shocks. Note, however, that we are interested in how two *dependent* variables relate to each other in response to a single exogenous independent variable (and not the interaction of two dependent variables multiplied together). Thus, our procedure is to rerun each of the balance sheet channel and income statement regressions above, but in each case we split the sample based on the variable describing the other channel.

5. Data Issues

5.1. Selection Bias

As described above, the OSB provided us with two separate databases: the "count" database, which includes a full count of every personal bankruptcy in Canada by year and six-digit postal code, and the "individual" database, which includes full balance sheet and full income statement data from each individual electronic (but not paper) filing. The OSB instituted an electronic (e-filing) system in 2002, and by 2007, essentially all bankruptcies were filed electronically. In the years of interest in this study (before and after the Ralph bucks payments of 2006), the percentages of all filings made electronically were as follows: 62.2 percent in 2005, 77.4 percent in 2006, 97.7 percent in 2007, and 98.9 percent in 2008. Thus, while our individual database contains a large majority of bankruptcy filers in Canada, it is not exhaustive and is limited to electronic rather than paper filers.

We argue that issues of possible selection bias (i.e., the choice of electronic rather than paper filings) should not be a concern for this study. This is because the choice of whether to file electronically or via paper is the decision of the bankruptcy trustee. As previously described, a trustee is typically a professional accountant licensed by the OSB to be a trustee and who, as an officer of the court, is designed to be impartial between debtors and creditors. We thus argue that the trustee's choice of an electronic- or paper-filing mechanism should not have any relationship at all to the financial situation of the individual bankruptcy filer. Indeed, it is probable that filers

are unaware of whether their trustee uses an electronic- or paper-filing system. Furthermore, the transition to electronic filing was essentially made by all trustees in Canada by the latter part of our study (97.7 percent of all filings were made electronically, and thus included in our data, by 2007, the year after the Ralph-bucks payment). Accordingly, there appears to be no systematic reasons for why specific trustees choose paper or electronic systems.

5.2. Measuring Net Balance Sheet Benefits (BSB) of Bankruptcy

Our balance sheet data are taken from OSB Form 79, which lists all assets as well as all liabilities of the bankruptcy filer. In particular, the data allow us to observe different classes of assets and liabilities (e.g., all secured and unsecured liabilities of different types). Furthermore, these data also include the current estimated market value of real estate and other assets, as determined by the bankruptcy trustee.

These data allow us to use the formula of Fay, Hurst, and White (2002) to calculate the net balance sheet benefits (BSB) of bankruptcy for each bankruptcy filer:

$$BSB_{it} = \max[D_{it} - \max[W_{it} - E_{it}, 0], 0], \quad (5)$$

where D_{it} is unsecured liabilities of filers eliminated in bankruptcy, W_{it} is net wealth of bankruptcy filers, and E_{it} represents bankruptcy exemptions available to filers in a particular year and province. The formula states that the benefits of bankruptcy accrue from the unsecured debt discharged (D). The costs of bankruptcy are the liquidated net wealth (W) that must be paid to secured creditors net of the provincial exemption level (E). If, for example, net wealth (W) is less than the provincial exemption level (E), then no wealth is liquidated.

Our measure of unsecured debt D is measured directly from the data on OSB Form 79, which lists the amount of all unsecured (e.g., credit card) debt outstanding at the time of bankruptcy. Our measure of net wealth (W) is also taken directly from Form 79, which lists the bankruptcy trustee's current market valuation of all assets (e.g., the bankruptcy trustee's valuation of real estate and vehicle assets) as well as the value of all secured debt outstanding (e.g., mortgage and car loans). Net wealth is the positive equity (current value of assets minus secured debt) the individual has in those assets, which will be liquidated and transferred to creditors under bankruptcy. All provincial bankruptcy exemptions (E) allowed in different provinces of Canada during our study period are described in Table 1, and all are included in our calculations of BSB. These exemptions are typically related to particular assets such as principal

residence, car, furniture, or pension accounts.

As previously described, the OSB ruled that that the Ralph-bucks cash transfer should be considered exempt from distribution to creditors. Thus, the cash from the exogenous payment should not affect BSB. That is, in terms of the BSB equation above, both W and E will increase by the size of the payment and thus the net effect of the payment on BSB, (W-E), will be zero. OSB Form 79 lists cash on hand as either exempt (from creditors) or nonexempt assets; thus we only include nonexempt cash as an asset in our calculation of BSB.

5.3. Measuring Net Income

We test our income statement channel hypothesis using data on total monthly income minus total monthly expenses. Our income statement data are taken from OSB Form 65. These income and expenses data are recorded at the specific time of the bankruptcy filing and reflect monthly income and expenses in the period immediately after the bankruptcy filing. Our data include all monthly income from various sources (e.g., employment, pension, spousal support, social assistance, etc.) as well as all monthly expenses of various kinds (e.g., child care, health expenses, rent, taxes, food, transport, etc.). All of these amounts are determined by the bankruptcy trustee rather than by the bankruptcy filer.

Our measure of net income (current monthly income minus current monthly expenses) differs from that of other papers in the literature (e.g., Gross and Souleles, 2002; Agarwal, et al., 2007; Scholnick, 2013; Elul, et al., 2010), which have defined liquidity using credit card utilization rates (i.e., available credit card lines relative to current credit card balances). Thus, our paper reflects income statement measures of liquidity rather than balance sheet measures of liquidity. This is because, as argued above, under bankruptcy law, balance sheet mechanics are very different at the moment of bankruptcy than at other periods. For example, we previously described how unsecured debt such as credit cards is written off under bankruptcy. Thus, immediately after bankruptcy all existing credit card agreements are typically terminated by the card providers to ensure the bankrupt has no further access to this unsecured debt, which the creditors typically do not recover in bankruptcy. It is thus not appropriate to use a balance-sheet-based measure of liquidity (e.g., credit card utilization rate) in the context of bankruptcy.

Furthermore, we argue that our definition of liquidity (i.e., current income minus current expenses at the time of the bankruptcy) is particularly appropriate to test the filing fees

hypothesis of Gross, Notowidigdo, and Wang (2013). As previously described, an important element of Canadian bankruptcy law, compared to U.S. bankruptcy law, is that bankruptcy filing fee payments can be made over time *following* the bankruptcy filing, typically over some months. This feature of the Canadian bankruptcy system is different from U.S. bankruptcy regulations, where filing fees and lawyers are required to be paid *before* the bankruptcy filing. We argue that the income statement data we use here provide an accurate description of the filer's liquidity status during the period immediately after the filing, which in Canada is when the filing fees need to be paid.

Furthermore, Canadian bankruptcy law states that it is not possible to use debt that will be discharged in the bankruptcy (specifically credit card debt) to pay bankruptcy filing fees (e.g., by using unutilized credit card debt to pay the bankruptcy fees, before the card contract is terminated by the card provider). This is another reason why it is inappropriate to use credit card utilization as a measure of liquidity available to pay bankruptcy filing fees.

5.4. Timing

Because our empirical specification that follows examines the timings of bankruptcy filings as they relate to the date of the exogenous Ralph-bucks payment, an important institutional issue concerns possible time lags between the date that an individual decides to file and the actual filing date as recorded in our OSB data. A filing can be processed only by a licensed bankruptcy trustee. Thus, before the filing can be submitted to the OSB, an individual typically needs to locate a trustee and then provide that trustee with all of the various data required to complete and verify the full balance sheet and income statement. This is typically a document-intensive bureaucratic process that can take some months to complete. Thus, even if the Ralph-bucks payment of January 2006 induced an individual to make a decision regarding a bankruptcy filing, the actual filing would likely occur some months later.

In order to account for these possible administrative lags, we examine the responses to the exogenous payment over three-month periods. Given that the event month of the payment was January 2006, we examine treatment group responses in the following three-month periods: February to April 2006, May to July 2006, August to October 2006, and November 2006 to January 2007. As a placebo test, we also examine the three-month period before the exogenous payment: November 2005 to January 2006.

5.5. Control Variables

Our individual-level OSB filing data provide us with a variety of demographic variables including individual-level data on filer's age, marital status (specifically divorce), household size, self-employment status, and prior insolvency. A unique element of our filer-level OSB data is our ability to capture the reasons given by filers for their financial distress. OSB Form 79 includes responses to the following open-ended question: "Give reasons for your financial distress." Our data include the full textual responses to this question from every filer in our database, and textual analysis software was used to code these responses into 17 separate categories (listed in Table 3). Each category is represented by a dummy variable, with multiple responses allowed per filer.

Our count data allow us to capture counts of *past* bankruptcies in the individual's postal code. The bankruptcy literature (e.g., Gross and Souleles, 2002; Fay, Hurst, and White, 2002; Livshits, MacGee, and Tertilt, 2010; White, 2011; Scholnick, 2014) has argued that neighborhood spillovers can influence bankruptcies because of stigma and/or information spillovers. To control for this, we measure bankruptcy counts for each postal code in the five-year period 2000–04. We construct an indicator variable equal to 1 if there were one or more bankruptcies in the postal code in the five-year period 2000-04.[1] This period falls before the data used in our main specification (2005 to 2008).

In order to control for income shocks in specific geographic areas, we use data from the Canada Revenue Agency (CRA), the country's tax authority. In particular, we use statistics for personal income tax returns filed at the level of census subdivision (CSD), which has an average population size of 5,000. These CRA data are available annually; thus, we are able to capture annual percentage rates of change in income within the specific geographic area. These data have measures of total income (taxable and not taxable) for all individuals in the CSD and also the total number of individual tax returns filed in the CSD. We can thus calculate the average personal income of individuals in the CSD by dividing total income across all tax filers in the CSD by total number of tax returns filed in the CSD. We control for education level using data taken from the 2006 Canadian census, which are made available by Statistics Canada at the DA

[1] All our estimates of interest are virtually unchanged with either this dummy variable or the actual count of past bankruptcies. However, some models do not converge with the actual counts. Thus, we report the dummy variable results.

level.

A large literature links issues such as bankruptcy with levels of financial literacy and numeracy (e.g., Lusardi, 2012, among many others). We employ a measure of numerical literacy, available at the DA geographic level, as a control variable. Our numerical literacy data were developed by Murray (2011) and are computed using the 2003 International Adult Literacy and Skills Survey (IALSS) and the 2006 census. IALSS evaluated numerical skills for a very large sample of the Canadian population. The average level of numerical literacy for each DA was estimated, based on the demographic characteristics of that DA.

6. Summary Statistics: Treatment and Control Groups

Tables 2 to 7 provide summary statistics for all of the various treatment and control groups in the study. We provide the OSB balance sheet data (i.e., OSB data from electronic files, including full filing details), as well as OSB count data (i.e., OSB listing the count of all filings at the postal code level). We also provide data for both methods of deriving the control group (full samples as well as propensity score matching).

As can be seen from a comparison of Tables 6 and 7 (DA characteristics before and after matching), propensity score matching reduces the average differences between the treatment and control groups in all observable variables for our count data. After the matching, the differences in observable variables are also reduced for individual balance sheet and income statement data, as revealed by comparing Tables 2 and 4 and Tables 3 and 5.

Figure 3 plots the distributions in the treatment and control groups for BSB, and Figure 4 plots these distributions for net income. In both cases, the control group is defined using propensity score matching.

7. Count Data Results: Bankruptcies and Proposals per DA per Year

This section uses the OSB count database to test the hypothesis that exogenous payments reduce the number of bankruptcy filings. Table 8 summarizes our results. Each cell in this table represents a separate regression, reporting only the exogenous payment variable. Full results are reported in the appendix. These results are all reported in percentage terms. Panel A of Table 8 examines treatment and control groups from the whole sample, while Panel B examines treatment and control groups using propensity score matching. Our results are very robust

between these two methodologies.

Line 1 of both Panels A and B in Table 8 indicates that the cash payment to the treatment group (Alberta in 2006) significantly *reduced* the average number of consumer bankruptcies compared to the control group by 7.8 percent in Panel A and 8.8percent in Panel B. These percentage terms are obtained directly from regression coefficients using the following formula from Long and Freese (2001): [exp(δ)- 1]*100 percent. These negative coefficients are thus consistent with the standard exogenous shock hypothesis (that a positive payment shock should reduce bankruptcies). As previously predicted, our results (line 2 of Table 8) show that the exogenous cash payment did not have any significant effect on consumer proposals, but it did have a significant negative effect on consumer bankruptcies (line 1). These findings are also inconsistent with an unobserved Alberta 2006 shock affecting both bankruptcies and proposals.

8. Individual Data Results: Balance Sheet and Income Statement Characteristics

Our individual data results are summarized in Tables 9 and 10. In these tables, we report only one coefficient per regression: the coefficient on the exogenous payment term. All other control variables, for all specifications, are reported in the online appendix. Each column of Tables 9 and 10 reports results for regressions where the treatment dummy is set to 1 for specific months (relative to the Ralph-bucks event month of January 2006) and 0 otherwise. In each table, our two methods for creating treatment and control groups are reported in Panel A (whole sample) and Panel B (propensity score matching).

Our results for net balance sheet benefits (BSB) as a dependent variable are provided in Table 9. The first rows of both panels provide results for the full sample (without sample splits) and show that the exogenous shock term is positive and strongly significant in the February to April 2006 period that immediately followed the payment month of January 2006. In these regressions, there is no significant response for any other quarter, either before the payment (i.e., the placebo test of November 2005 to January 2006) or after the payment (May to July 2006, August to October 2006, or November 2006 to January 2007). This positive coefficient on the exogenous payment variable indicates that the net balance sheet benefits of treatment group filers who received the Ralph-bucks payment are significantly larger than the net BSB of the control group. This is consistent with our hypothesis that those filers who have relatively high BSB will not be dissuaded from filing by the exogenous payment but will proceed to file in spite of

receiving the payment. Marginal potential filers, on the other hand, who have low BSB are more likely to be persuaded not to file following receipt of the exogenous payment.

The second and third rows of Panels A and B report results from the same regression except that we split this sample into two groups based on income statement characteristics of the individual. Specifically, our sample split is based on whether net monthly income minus expenses is positive or negative. The key finding from these rows in both Panel A and B is that our main result (i.e., a strongly significant positive coefficient for the time period immediately after the exogenous payment) holds only when we limit the sample to negative net income individuals, with income <= expenses (second row of each panel). On the other hand, all coefficients across all time periods are insignificant for individuals with positive net income (third row of each panel). These results imply that the exogenous payment will be particularly effective in persuading individuals who have *both* negative net income (which suggests they can use the exogenous cash payment to pay current expenses to avoid bankruptcy) *and* low financial benefits of the bankruptcy not to file (i.e., they have low balance sheet incentives to file).

The various columns in Table 9 allow us to compare the coefficients across different time periods relative to the event month of January 2006. In no specification was the coefficient significant in the period before the payment (i.e., November 2005 to January 2006), which acts as a placebo test. In the propensity score results (Panel B), all significant coefficients occur in the period *immediately* after the payment (i.e., February to April 2006). For an additional robustness test, in the final column of Table 9, we report results where, instead of restricting the time period to three months, we examine all 12 months of 2006. These results are consistent with our main three-month results reported above. We find positive and significant coefficients and also where we split the samples as described above. The main difference between the three-month and 12-month specifications is that the magnitudes and significance of the 12-month coefficients are substantially smaller in the 12-month specification, which is consistent with the effect of the Ralph-bucks payment dissipating over time.

In Table 10, we use income minus expenses as the dependent variable. An important issue in these results is that the propensity score treatment group results in Panel B are only significant at the 10 percent level, even though the results in Panel A for the whole sample treatment group are significant at 1 percent. Because the creation of control groups can be considered more robust when using propensity score methods, we do not consider the whole sample results reported in

Panel A of Table 10 to be robust. While the propensity score results reported in Panel B have the expected sign and the expected timing (i.e., a positive coefficient on net income in the period from May to July 2006), because of the low significance levels on these coefficients we conclude there is, at best, weak support for the hypothesis that the exogenous shocks affect bankruptcy through the income statement channel.

In order to compare our results with individual filing data and DA bankruptcy counts, we calculate the proportion of individual filers who have low benefits and low net income in the treatment and control groups. The proportion is defined as the percentage of filers in either group that have net income below 0 and BSB below the median. Our data show that the treatment group contains about 6.18 percent fewer low-liquidity and low-benefits filers than the propensity scored control group. These results are consistent with our earlier findings for bankruptcy counts, which suggested that bankruptcy counts declined in the treatment group by around 7 percent.

9. Conclusion

The theory that exogenous shocks cause bankruptcy has long been central to the bankruptcy literature. Several recent studies have attempted to provide evidence for this hypothesis by examining whether various kinds of exogenous shocks affect the number of bankruptcy filings. The aim of this paper, however, is not only to examine *how many* bankruptcies are caused by exogenous shocks, but also to provide new evidence on the possible *channels* by which exogenous shocks cause individuals to file for bankruptcy. In particular, we propose the hypothesis that an exogenous shock could influence an individual's bankruptcy decision, either through the balance sheet channel or the income statement channel, or both.

Our methodology exploits an exogenous, politically driven government cash payment, combined with unique bankruptcy filing data containing full balance sheets and full income statements from every Canadian e-filer. Our main conclusion is that exogenous shocks cause bankruptcy through the balance sheet channel, although there is some additional evidence that they also cause bankruptcy through the income statement channel. We also find support for the hypothesis that the two channels interact and that positive income shocks reduce bankruptcies of filers with both low liquidity and low balance sheet benefits.

Bibliography

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.

Elul, R., N. Souleles, S. Chomsisengphet, D. Glennon, and R. Hunt. 2010. "What 'Triggers' Mortgage Default?" *American Economic Review: Papers & Proceedings, 100*, 490–4.

Fay, S., E. Hurst, and M. White. 2002. "The Household Bankruptcy Decision," *American Economic Review, 92*(3), 706–18.

Gross, T., and M. Notowidigdo. 2011. "Health Insurance and the Consumer Bankruptcy Decision: Evidence from Expansions of Medicaid," *Journal of Public Economics, 95*, 767–78.

Gross, T., M. Notowidigdo, and J. Wang. 2013. "Liquidity Constraints and Consumer Bankruptcy: Evidence from Tax Rebates," *Review of Economics and Statistics*, forthcoming.

Gross, D., and N. Souleles. 2002. "An Empirical Analysis of Personal Bankruptcy and Delinquency," *Review of Financial Studies, 15*(1), 319–47.

Hankins, S., M. Hoekstra, and P. M. Skiba. 2011. "The Ticket to Easy Street? The Financial Consequences of Winning the Lottery," *Review of Economics and Statistics, 93*(3), 961–9.

Heckman, J., H. Ichimura, and P.E. Todd. 1997. "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme," *Review of Economic Studies, 64*(4), 605–54.

Heckman, J., H. Ichimura, and P.E. Todd. 1998. "Matching as an Econometric Evaluation Estimator," *Review of Economic Studies 65*(2), 261–94.

Levitt, S. 1997. "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime," *American Economic Review, 87*(3), 270–90.

Livshits, I., J. MacGee, and M. Tertilt. 2010. "Accounting for the Rise in Consumer Bankruptcies," *American Economic Journal: Macroeconomics, 2*(2), 165–93.

Long, S., and J. Freese. 2001. *Regression Models for Categorical Dependent Variables using Stata.* College Station, Tex.: Stata Press.

Lusardi, A. 2012. "Numeracy, Financial Literacy, and Financial Decision-making," National Bureau of Economic Research Working Paper No. 17821.

Morrison, E., A. Gupta, L. Olson, L. Cook, and H. Keenan. 2013. "Health and Financial Fragility: Evidence from Car Crashes and Consumer Bankruptcy," University of Chicago Coase-Sandor Institute for Law & Economics Research Paper 655.

Murray, S. 2011. "Financial Literacy: A Conceptual Review," research paper prepared for the Task Force on Financial Literacy, Canadian Council on Learning.

Ramsay, I. D. 1999. "Individual Bankruptcy: Preliminary Findings of a Socio-Legal Analysis," *Osgoode Hall Law Journal*, *37*, 15–82.

Scholnick, B. 2013. "Consumption Smoothing after the Final Mortgage Payment: Testing the Magnitude Hypothesis," *Review of Economics and Statistics*, *95*(4), 1444–9.

Scholnick, B. 2014. "Bankruptcy Spillovers between Close Neighbors," working paper, University of Alberta School of Business.

White, M. 2011. "Corporate and Personal Bankruptcy Law," *Annual Review of Law and Social Science, 7*, 139–64.

Figure 1. Average Bankruptcy Count per DA per Year: Alberta (Treatment) and Propensity Score Matched Controls

Figure 2. Difference in Average Bankruptcy Count per DA per Year: Alberta (Treatment) Minus Propensity Score Matched Controls

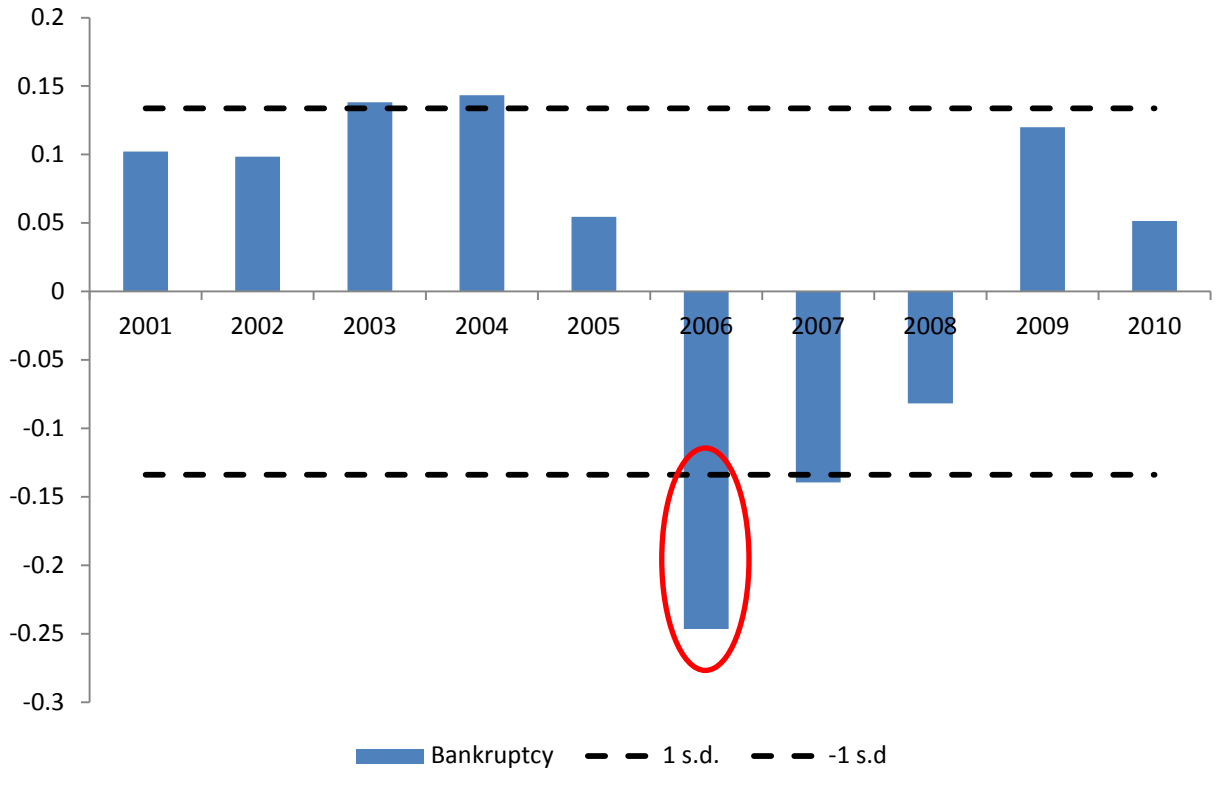
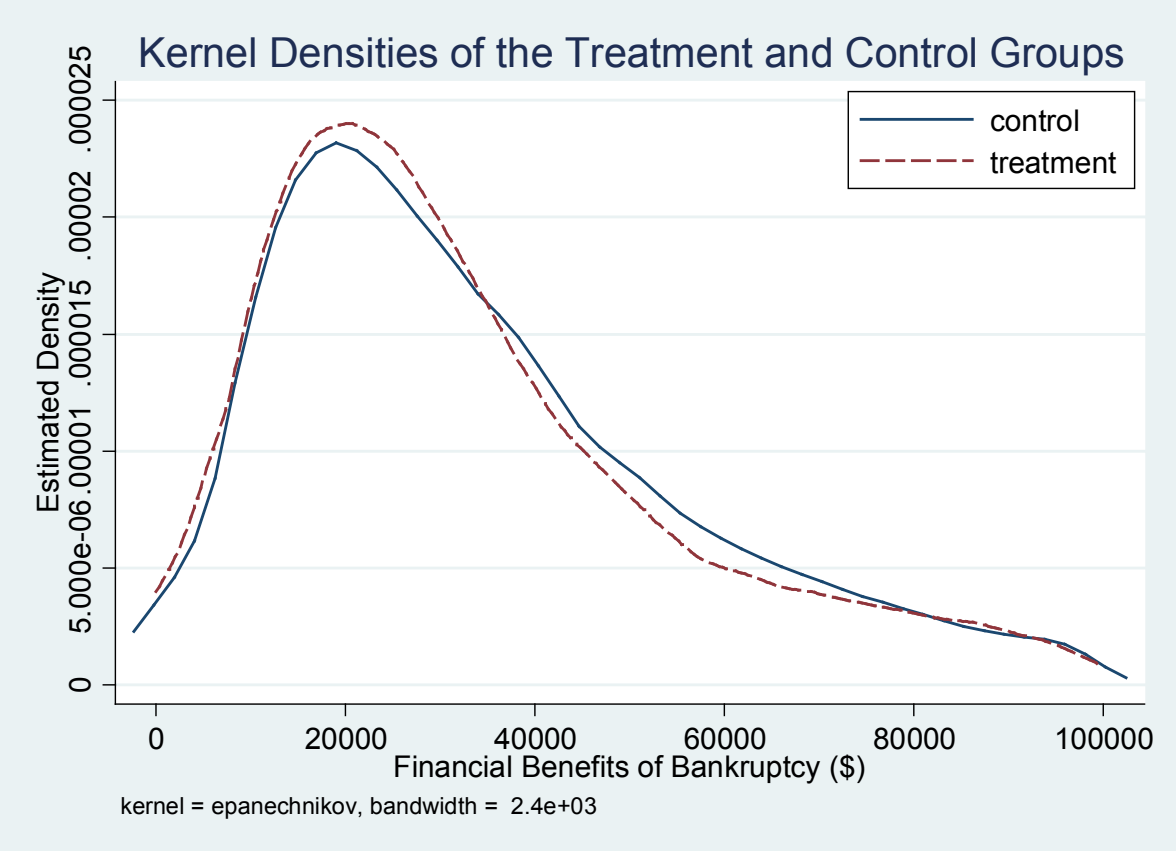
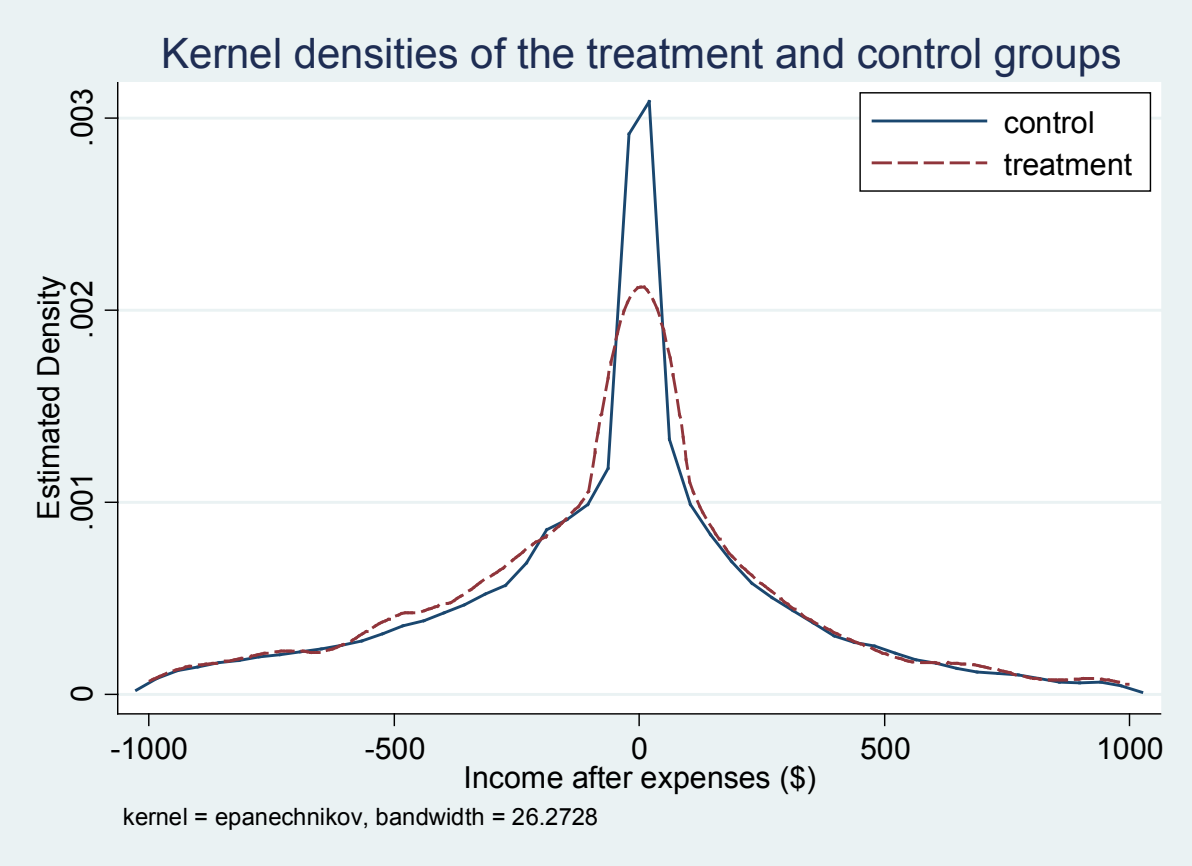


Figure 3. Density of Balance Sheet Benefits of Bankruptcy in the Treatment Group (Alberta 2006) and Propensity Score Matched Control Group (2005-08)



Notes: Benefits are constrained to be below $100,000 to avoid a very long right tail. We use propensity score matched samples as described in the text. Data span the period 2005–08.

Figure 4. Density of Net Income after Expenses in the Treatment Group (Alberta 2006) and Propensity Score Matched Control Group (2005-08)



Notes: We use observations with balance sheet benefits below $100,000 and monthly net income of between -$1,000 and $1,000 (91 percent of observations) to avoid very long tails. We use propensity score matched samples as described in the text. Data span the period 2005–08.

Table 1. Bankruptcy Exemptions by Canadian Provinces

	Exemptions					
Provinces	**House**	**Car**	**Pension**	**Personal Effects**	**Furniture**	**Land**
Alberta	40,000	5,000	No	4,000	4,000	All if rural
British Columbia	12,000	5,000	All	Up to 4,000 together		No
Manitoba	2,500	3,000	All	All	4,500	No
New Brunswick	No	6,500	All	No	5,000	No
Newfoundland and Labrador	10,000	2,000	All	4,000	4,000	No
Nova Scotia	No	6,500	All	All	All	No
Ontario	No	5,650	All	5,600	11,300	No
Prince Edward Island	No	3,000	All	All	2,000	No
Quebec	No	No	All	Up to 6000 together		No
Saskatchewan	50,000	10,000	All	7,500	All	No

Notes: Data are from http://www.bankruptcycanada.com/bankruptcyexemptions.htm.
All amounts are in Canadian dollars and apply to equity in the asset. These amounts represent maximum values of assets protected from seizure by creditors in bankruptcy.

Table 2. Summary Statistics of OSB Individual Filer Data and Merged Neighborhood Data (Whole Sample)

Treatment group is electronically filed bankruptcies in Alberta in 2006, and control group is electronic filings in the rest of Canada during 2005-08 and in Alberta except during 2006.

Variable	Treatment Group			Control Group		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
OSB Individual Filer Data						
Financial benefits ($)	3819	32506	21425	206020	33131	21576
Log of financial benefits (log of $)	3819	9.8	2.7	206020	10.01	1.92
Monthly income after monthly expenses ($)	3819	-157.7	690.3	206020	-126.8	542.4
Age (years)	3819	41.57	13.56	206020	42.7	13.35
Self-employment (dummy)	3819	0.05	0.219	206020	0.047	0.211
Divorce (dummy)	3819	0.152	0.359	206020	0.132	0.339
Household size (count)	3819	1.950	1.290	206020	2.025	1.302
Prior defaults (dummy)	3819	0.168	0.374	206020	0.174	0.379
Neighborhood-Level Data (Based on Filer's Postal Code)						
Lagged neighborhood effect (postal code) (dummy)	3819	0.662	0.473	206020	0.658	0.474
Postal code population (persons)	3819	36.6	53.3	206020	36.5	49.8
Annual average income (CSD) ($000)	3819	48.3	9.7	206020	37.7	8
Change in income (CSD) (percent)	3819	10.9	3.1	206020	3.069	6.713
Numerical literacy (score between 100 and 500)	3819	274	11.2	206020	264.6	12.9
High school (DA) (proportion of DA population)	3819	0.245	0.069	206019	0.242	0.073
Apprenticeship (DA) (proportion of DA population)	3819	0.13	0.06	206019	0.126	0.065
College (DA) (proportion of DA population)	3819	0.194	0.065	206019	0.184	0.071
University (DA) (proportion of DA population)	3819	0.156	0.1	206019	0.146	0.094
Graduate (DA) (proportion of DA population)	3819	0.049	0.053	206019	0.058	0.061

Census subdivision (CSD) and dissemination areas (DA) are census regions defined by Statistics Canada. CSD average population is 5,000 and DA average population is 500. Postal codes are defined by Canada Post and on average contain 13 households.

Table 3. Summary Statistics of Reasons for Financial Distress (Whole Sample)
Based on textual answers to OSB question: "Give reasons for your financial distress." Treatment group is electronically filed bankruptcies in Alberta in 2006, and control group is electronic filings in the rest of Canada during 2005-08 and in Alberta except during 2006)

Variable	Treatment Group			Control Group		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Overuse of credit	3819	0.559	0.497	206020	0.596	0.491
Insufficient income	3819	0.349	0.477	206020	0.343	0.475
Health concerns	3819	0.266	0.442	206020	0.206	0.404
Unemployment	3819	0.252	0.434	206020	0.269	0.443
Marital breakdown	3819	0.218	0.413	206020	0.178	0.382
Business failure	3819	0.098	0.297	206020	0.073	0.260
Supporting relatives	3819	0.086	0.280	206020	0.053	0.224
Tax liabilities	3819	0.055	0.228	206020	0.040	0.197
Moving/relocation	3819	0.050	0.219	206020	0.019	0.136
Substance abuse	3819	0.041	0.199	206020	0.021	0.143
Gambling	3819	0.037	0.190	206020	0.023	0.149
Accidents/emergencies	3819	0.035	0.183	206020	0.025	0.155
Legal action	3819	0.020	0.141	206020	0.013	0.115
Loans to friends	3819	0.020	0.140	206020	0.013	0.115
Garnishee	3819	0.015	0.121	206020	0.016	0.124
Bad/poor investments	3819	0.012	0.109	206020	0.012	0.111
Student loans	3819	0.007	0.081	206020	0.007	0.083

All variables are dummies. Textual responses to the question "Give reasons for your financial difficulties" are coded into 17 categories using textual analysis software. More than one reason can be provided, so categories are not mutually exclusive.

Table 4. Summary Statistics of OSB Individual Filer Data and Merged Neighborhood Data (Propensity Score Matched Sample)

Propensity score matching is used to match DAs in Alberta 2005 with DAs in the rest of Canada in 2005 based on all observed DA attributes. Treatment group is electronically filed bankruptcies in matched DAs in Alberta during 2006, and control group is electronic filings in the matched DAs in the rest of Canada during 2005-08 and in Alberta except during 2006.

	Treatment Group			Control Group		
Variable	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**
OSB Individual Filer Data						
Financial benefits ($)	3709	32529	21416.64	32251	33947	21530.1
Log of financial benefits (log of $)	3709	9.80	2.704	32251	9.93	2.39
Monthly income after monthly expenses ($)	3709	-159.81	688.1	32251	-141.90	634.26
Age (years)	3709	41.53	13.543	32251	41.65	13.31
Self-employment (dummy)	3709	0.050	0.219	32251	0.057	0.232
Divorce (dummy)	3709	0.152	0.359	32251	0.139	0.346
Household size (count)	3709	1.94	1.287	32251	2.02	1.33
Prior defaults (dummy)	3709	0.170	0.375	32251	0.159	0.365
Neighborhood-Level Data (Based on Filer's Postal Code)						
Lagged neighborhood effect (postal code) (dummy)	3709	0.662	0.473	32251	0.631	0.483
Postal code population (persons)	3709	36.824	53.654	32251	36.21	53.43
Annual average income (CSD) ($000)	3709	48.329	9.681	32251	43.83	10.36
Change in income (CSD) (percent)	3709	10.92	3.095	32251	5.828	4.356
Numerical literacy (score between 100 and 500)	3709	274.3	11.133	32251	273.9	13.4
High school (DA) (proportion of DA population)	3709	0.245	0.069	32251	0.241	0.073
Apprenticeship (DA) (proportion of DA population)	3709	0.130	0.059	32251	0.131	0.062
College (DA) (proportion of DA population)	3709	0.194	0.065	32251	0.198	0.072
University (DA) (proportion of DA population)	3709	0.158	0.100	32251	0.155	0.101
Graduate (DA) (proportion of DA population)	3709	0.049	0.054	32251	0.051	0.057

Census subdivision (CSD) and dissemination area (DA) are census regions defined by Statistics Canada. CSD average population is 5,000, and DA average population is 500. Postal codes are defined by Canada Post and on average contain 13 households.

Table 5. Summary Statistics of Reasons for Financial Distress Data (Propensity Score Matched Sample)

Variable	Treatment Group			Control Group		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Overuse of credit	3709	0.557	0.497	32251	0.613	0.487
Insufficient income	3709	0.348	0.476	32251	0.340	0.474
Health concerns	3709	0.264	0.441	32251	0.236	0.425
Unemployment	3709	0.255	0.436	32251	0.263	0.440
Marital breakdown	3709	0.219	0.414	32251	0.199	0.399
Business failure	3709	0.098	0.297	32251	0.092	0.289
Supporting relatives	3709	0.085	0.279	32251	0.070	0.255
Tax liabilities	3709	0.055	0.227	32251	0.053	0.225
Moving/relocation	3709	0.051	0.221	32251	0.038	0.192
Substance abuse	3709	0.041	0.199	32251	0.028	0.166
Gambling	3709	0.037	0.189	32251	0.028	0.165
Accidents/emergencies	3709	0.035	0.183	32251	0.028	0.166
Legal action	3709	0.021	0.144	32251	0.016	0.124
Loans to friends	3709	0.020	0.141	32251	0.013	0.113
Garnishee	3709	0.015	0.121	32251	0.015	0.122
Bad/poor investments	3709	0.012	0.109	32251	0.012	0.110
Student loans	3709	0.006	0.079	32251	0.009	0.092

All variables are dummies. Textual responses to the question "Give reasons for your financial difficulties" are coded into 17 categories using textual analysis software. More than one reason can be provided, so categories are not mutually exclusive.

Table 6. Summary Statistics of Bankruptcy Count Data and Control Variables, Treatment Group (DA, Alberta in 2006) and Control Group (all Canadian DAs except for Alberta in 2006) (whole sample)

	Treatment Group			Control Group		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Consumer bankruptcy (DA) (count)	4143	1.154	1.669	142761	1.687	2.296
Consumer proposal (DA) (count)	4143	0.235	0.577	142761	0.416	0.923
Lagged neighborhood effect (DA) (dummy)	4143	0.922	0.268	142761	0.919	0.272
Population (DA) (persons)	4143	670.8	585.9	142761	629	449
Average personal income (DA) ($000)	4143	42.334	25.16	142761	36.09	18.41
Change in average personal income (CSD) (percent)	4143	11.078	2.925	138614	3.568	6.165
Standard error of income (DA) ($)	4143	5148	9773	142761	3760	6147
Urban-rural index (between 1 and 8)	4143	1.875	1.596	142761	1.813	1.525
Homeowners (DA) (proportion)	4143	0.743	0.249	142761	0.725	0.264
Males (DA) (proportion)	4143	0.499	0.031	142761	0.489	0.032
Age 20-39 (DA) (proportion)	4143	0.291	0.103	142761	0.262	0.084
Age 40-64 (DA) (proportion)	4143	0.342	0.069	142761	0.359	0.062
Age over 65 (DA) (proportion)	4143	0.114	0.090	142761	0.140	0.092
Divorced (DA) (proportion)	4143	0.080	0.034	142761	0.078	0.036
Separated (DA) (proportion)	4143	0.029	0.016	142761	0.031	0.018
Widowed (DA) (proportion)	4143	0.049	0.047	142761	0.060	0.047
High school (DA) (proportion)	4143	0.235	0.074	142761	0.237	0.079
Apprenticeship (DA) (proportion)	4143	0.122	0.063	142761	0.113	0.066
College (DA) (proportion)	4143	0.199	0.069	142761	0.187	0.073
University (DA) (proportion)	4143	0.183	0.111	142761	0.177	0.107
Graduate (DA) (proportion)	4143	0.064	0.071	142761	0.077	0.079
Numerical literacy (DA) (score between 100 and 500)	4143	276.7	11.8	142761	268.5	13.8

Table 7. Summary Statistics of Bankruptcy Count Data and Control Variables for Propensity Score Matched Treatment and Control Groups (Propensity Score Matched Sample)

	Treatment Group			Control Group		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Consumer bankruptcy (DA) (count)	4143	1.154	1.669	28998	1.379	2.001
Consumer proposal (DA) (count)	4143	0.235	0.577	28998	0.294	0.767
Lagged neighborhood effect (DA) (dummy)	4143	0.922	0.268	28998	0.919	0.272
Population (DA) (persons)	4143	670.782	585.911	28998	655.701	614.673
Average personal income (DA) ($000)	4143	42.34	25.16	28998	40.7	29.42
Change in average personal income (CSD) (percent)	4143	11.078	2.925	28998	6.160	4.786
Standard error of income (DA) ($)	4143	5148	9773	28988	4599	8815
Urban-rural index (between 1 and 8)	4143	1.875	1.596	28988	1.845	1.534
Homeowners (DA) (proportion)	4143	0.743	0.249	28998	0.731	0.250
Males (DA) (proportion)	4143	0.499	0.031	28998	0.497	0.032
Age 20–39 (DA) (proportion)	4143	0.291	0.103	28998	0.289	0.104
Age 40–64 (DA) (proportion)	4143	0.342	0.069	28998	0.340	0.068
Age over 65 (DA) (proportion)	4143	0.114	0.090	28998	0.119	0.087
Divorced (DA) (proportion)	4143	0.080	0.034	28998	0.080	0.035
Separated (DA) (proportion)	4143	0.029	0.016	28998	0.029	0.016
Widowed (DA) (proportion)	4143	0.049	0.047	28998	0.051	0.045
High school (DA) (proportion)	4143	0.235	0.074	28998	0.235	0.078
Apprenticeship (DA) (proportion)	4143	0.122	0.063	28998	0.121	0.065
College (DA) (proportion)	4143	0.199	0.069	28998	0.198	0.074
University (DA) (proportion)	4143	0.183	0.111	28998	0.182	0.115
Graduate (DA) (proportion)	4143	0.064	0.071	28998	0.066	0.075
Numerical literacy (DA) (score between 100 and 500)	4143	276.687	11.763	28998	277.264	13.399

Table 8. The Effect of the Exogenous Payment on Total Bankruptcy Counts (Paper + Electronic) per DA

A finding of a significant reduction in bankruptcies after a positive income shock from the exogenous payment supports the standard exogenous shock explanation of bankruptcy (i.e., a positive shock reduces bankruptcy). Consumer bankruptcies are the main test, while consumer proposals are falsification tests. These tests use a negative binomial model with standard errors clustered at the DA level.

	Pooled data robust s.e.	DA fixed effects
PANEL A: WHOLE SAMPLE		
Consumer bankruptcies	-7.879***	-6.779***
Consumer proposals	-0.380	0.108
PANEL B: PROPENSITY SCORE MATCHED SAMPLE		
Consumer bankruptcies	-8.881***	-10.506**
Consumer proposals	-4.4	-4.4

Notes: This table summarizes the full results reported in the appendix. Each cell reflects one regression and only reports the estimated coefficient on the exogenous payment (differences-in-differences) term. Results are reported in percentage terms. *** indicates significance at 1 percent, ** is significance at 5 percent, and * is significance at 10 percent. Further details are provided in the appendix. DA fixed effects specification for consumer proposals did not converge.

Table 9. The Effect of the Exogenous Payment on Balance Sheet Benefits of Bankrupts

A finding of a positive effect of the exogenous payment on (1) net balance sheet benefits of (2) filers with lower net income after expenses indicates that filers with (1) smaller balance sheet benefits and (2) lower net income are dropping out of the pool of bankruptcy filers after receiving the cash transfer, thus increasing the average net benefits of the remaining filers in the treatment group. Tests in Panel A use OLS with DA clustered standard errors. Tests in Panel B use OLS with DA clustered standard errors on a sample of propensity score matched DAs. The dependent variable, net balance sheet benefits, is logged because no observations are negative.

		Time Periods			
Nov-Jan 2005-06	**Feb-April 2006**	**May-July 2006**	**Aug-Oct 2006**	**Nov-Jan 2006-07**	**Jan-Dec 2006**
PANEL A: WHOLE SAMPLE					
		All filers			
-0.097	0.323***	0.070	0.108	-0.021	0.122**
		Households with negative income after expenses			
-0.026	0.383***	0.221*	0.094	-0.032	0.176***
		Households with positive income after expenses			
-0.226	0.241	-0.123	0.122	-0.007	0.045
PANEL B: PROPENSITY SCORE MATCHED SAMPLE					
		All filers			
-0.106	0.246**	0.033	0.190	-0.049	0.111*
		Households with negative income after expenses			
-0.039	0.291**	0.159	0.194	-0.096	0.151*
		Households with positive income after expenses			
-0.237	0.165	-0.131	0.176	0.014	0.044

Notes: This table summarizes the full results reported in the appendix. Each cell reflects one regression and only reports the estimated coefficient on the exogenous payment (differences-in-differences) term. For financial benefits, results are reported in percentage terms. *** indicates significance at 1 percent, ** is significance at 5 percent, and * is significance at 10 percent. Further details are provided in the appendix.

Table 10. The Effect of the Exogenous Payment on Net Income after Expenses of Bankrupts

A finding of a positive effect of the exogenous payment on net income after expenses indicates that filers with lower net income are dropping out of the pool of bankruptcy filers after receiving the cash transfer, thus increasing the average net income after expenses of the remaining filers in the treatment group. Tests in Panel A use OLS with DA clustered standard errors. Tests in Panel B use OLS with DA clustered standard errors on a sample of propensity score matched DAs. The dependent variable, net income after expenses, is measured in levels ($) because it takes negative values.

		Time Periods			
Nov-Jan 2005-06	**Feb-April 2006**	**May-July 2006**	**Aug-Oct 2006**	**Nov-Jan 2006-07**	**Jan-Dec 2006**
PANEL A: WHOLE SAMPLE					
		All filers			
-6.578	25.825	65.771***	55.105**	-2.097	39.264***
		Filers with below median balance sheet benefits			
-5.414	43.454	84.541***	50.576*	21.456	45.601***
		Filers with above median balance sheet benefits			
-3.645	8.076	44.741	58.767	-26.896	31.381
PANEL B: PROPENSITY SCORE MATCHED SAMPLE					
		All filers			
-23.677	6.626	48.139*	41.042	-3.676	23.072
		Filers with below median balance sheet benefits			
-29.391	49.616	65.379*	39.732	-9.088	34.514*
		Filers with above median balance sheet benefits			
-10.834	-38.533	22.032	45.160	-9.447	6.911

Notes: This table summarizes the full results reported in the online appendix. Each cell reflects one regression and only reports the estimated coefficient on the exogenous payment (differences-in-differences) term. For financial benefits, results are reported in percentage terms. *** indicates significance at 1 percent, ** is significance at 5 percent, and * is significance at 10 percent. Further details are provided in the appendix.

WEB APPENDIX

for

How Do Exogenous Shocks Cause Bankruptcy? Balance Sheet and Income Statement Channels

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This appendix reports results for propensity score matched samples (Tables 8 through 10). Additional results are available upon request.

Table A1. The Effect of the Exogenous Payment on the Number of Bankruptcies
(Full results for all variables reported in Table 8.)

	Consumer Bankruptcy		Consumer Proposal	
	Pooled data	DA	Pooled data	DA
Independent Variables	robust s.e.	fixed effects	robust s.e.	fixed effects
Exogenous payment (DA)	-0.093***	-0.111**	-0.045	-0.045
	(0.026)	(0.050)	(0.053)	(0.052)
Lagged neighborhood effect (DA)	1.186***		1.148***	
	(0.075)		(0.101)	
Average income (DA)	-0.004***		-0.001	
	(0.001)		(0.001)	
Change in average personal income (CSD)	0.001		0.005	
	(0.002)		(0.003)	
Numerical literacy (DA)	0.004**		0.001	
	(0.002)		(0.003)	
Divorced (DA)	3.358***		2.614***	
	(0.398)		(0.569)	
Separated (DA)	5.270***		3.509***	
	(0.867)		(1.228)	
Widowed (DA)	-0.020		0.773	
	(0.507)		(0.744)	
Homeowners (DA)	-0.651***		-0.279***	
	(0.058)		(0.085)	
Age 20-39 (DA)	1.334***		2.537***	
	(0.209)		(0.281)	
Age 40-64 (DA)	0.315		0.472	
	(0.265)		(0.349)	
Age over 65 (DA)	0.775***		0.138	
	(0.261)		(0.403)	
High school (DA)	-0.353*		0.266	
	(0.190)		(0.250)	
Apprenticeship (DA)	0.001		1.128***	
	(0.248)		(0.313)	
College degree (DA)	-0.746***		-0.048	
	(0.228)		(0.297)	
University degree (DA)	-1.829***		-1.217***	
	(0.198)		(0.273)	
Graduate degree (DA)	-1.916***		-0.233	
	(0.249)		(0.363)	
Males (DA)	0.050		-0.188	
	(0.364)		(0.524)	
Population (DA)	0.001***		0.001***	
	(0.000)		(0.000)	
Constant	-1.137**	2.010***	-4.850***	-0.423
	(0.473)	(0.586)	(0.668)	(0.903)
Provincial dummies	Yes	Yes	Yes	Yes
Annual dummies	Yes	Yes	Yes	Yes
Observations	33,131	7,610	33,131	17,622

Notes: ***, **, and * denote statistical significance at 1 percent, 5 percent, and 10 percent, respectively. Standard errors are in parentheses.

Table A2. Effects of Exogenous Payments on the Balance Benefits of Bankruptcy (All Filers)

	Time Periods					
Independent Variables	Nov-Jan 2005-06	Feb-April 2006	May-July 2006	Aug-Oct 2006	Nov-Jan 2006-07	Jan-Dec 2006
Exogenous payment (DA)	-0.106	0.246**	0.033	0.190	-0.049	0.111*
	(0.135)	(0.097)	(0.123)	(0.120)	(0.105)	(0.065)
Age	-0.008***	-0.008***	-0.008***	-0.008***	-0.008***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Self-employment	0.226***	0.226***	0.226***	0.226***	0.226***	0.226***
	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)
Divorce	-0.032	-0.032	-0.032	-0.031	-0.032	-0.032
	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
Numerical literacy	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Lagged neighborhood effect	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Average income (CSD)	0.005**	0.005**	0.005**	0.005**	0.005**	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Change in income (CSD)	0.010***	0.009***	0.009***	0.009***	0.010***	0.008***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Prior defaults	-0.068*	-0.068*	-0.069*	-0.068*	-0.068*	-0.069*
	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
High school (DA)	-0.477*	-0.484*	-0.479*	-0.477*	-0.479*	-0.481*
	(0.254)	(0.254)	(0.254)	(0.254)	(0.254)	(0.254)
Apprenticeship (DA)	-0.451	-0.456	-0.454	-0.449	-0.455	-0.454
	(0.281)	(0.282)	(0.281)	(0.282)	(0.281)	(0.281)
College (DA)	-0.553**	-0.556**	-0.554**	-0.549**	-0.555**	-0.550**
	(0.252)	(0.252)	(0.252)	(0.253)	(0.252)	(0.252)
University (DA)	0.170	0.168	0.168	0.170	0.168	0.168
	(0.253)	(0.253)	(0.253)	(0.254)	(0.254)	(0.254)
Graduate (DA)	0.182	0.174	0.182	0.185	0.181	0.180
	(0.351)	(0.351)	(0.351)	(0.351)	(0.351)	(0.351)
Postal code population	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household size	0.032***	0.032***	0.032***	0.033***	0.032***	0.032***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Constant	10.475***	10.501***	10.487***	10.501***	10.483***	10.514***
	(0.444)	(0.444)	(0.445)	(0.444)	(0.444)	(0.445)
Reasons for financial distress	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Annual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Monthly & annual f.e. interaction	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,960	35,960	35,960	35,960	35,960	35,960

Notes: Raw coefficients using OLS are reported with logarithm of benefits as the dependent variable. ***, **, and * denote statistical significance at 1 percent, 5 percent, and 10 percent, respectively. Standard errors are in parentheses. Data include filers in propensity score matched DAs in 2005–08; we drop observations with more than $100,000 in benefits.

Table A3. Effect of Exogenous Payments on the Net Income of Bankrupts (All Filers)

	Time Periods					
Independent Variables	Nov-Jan 2005-06	Feb-April 2006	May-July 2006	Aug-Oct 2006	Nov-Jan 2006-07	Jan-Dec 2006
Exogenous payment (DA)	-23.677	6.626	48.139*	41.042	-3.676	23.072
	(29.569)	(28.537)	(28.095)	(31.494)	(30.169)	(16.800)
Age	0.455*	0.450*	0.450*	0.454*	0.451*	0.450*
	(0.266)	(0.266)	(0.266)	(0.266)	(0.266)	(0.266)
Self-employment	-94.36***	-94.439***	-94.365***	-94.457***	-94.436***	-94.399***
	(16.317)	(16.322)	(16.314)	(16.320)	(16.321)	(16.320)
Divorce	-6.187	-6.198	-6.247	-6.112	-6.187	-6.173
	(9.039)	(9.040)	(9.038)	(9.036)	(9.038)	(9.036)
Numerical literacy	-1.476***	-1.479***	-1.482***	-1.488***	-1.479***	-1.486***
	(0.531)	(0.532)	(0.531)	(0.531)	(0.532)	(0.531)
Lagged neighborhood effect	13.691*	13.707*	13.651*	13.698*	13.711*	13.670*
	(8.075)	(8.076)	(8.076)	(8.076)	(8.076)	(8.077)
Average income (CSD)	-2.876***	-2.862***	-2.853***	-2.856***	-2.863***	-2.846***
	(0.576)	(0.575)	(0.576)	(0.575)	(0.575)	(0.575)
Change in income (CSD)	1.841*	1.773*	1.677*	1.692*	1.796*	1.557
	(0.985)	(0.988)	(0.987)	(0.986)	(0.984)	(0.996)
Prior defaults	-43.88***	-43.912***	-44.028***	-43.897***	-43.917***	-43.995***
	(10.110)	(10.115)	(10.117)	(10.113)	(10.117)	(10.114)
High school (DA)	106.009	105.460	104.768	105.825	105.533	104.967
	(71.733)	(71.757)	(71.668)	(71.741)	(71.736)	(71.744)
Apprenticeship (DA)	-39.376	-39.940	-41.114	-39.004	-39.960	-39.921
	(85.582)	(85.587)	(85.538)	(85.605)	(85.585)	(85.557)
College (DA)	126.240*	126.039*	126.344*	127.162*	126.028*	126.878*
	(75.080)	(75.106)	(75.067)	(75.098)	(75.128)	(75.095)
University (DA)	47.563	47.262	46.694	47.752	47.260	47.175
	(74.980)	(75.004)	(74.966)	(74.971)	(74.996)	(75.012)
Graduate (DA)	79.614	79.391	79.091	80.275	79.510	79.221
	(102.046)	(102.099)	(102.063)	(102.076)	(102.075)	(102.062)
Postal code population	0.068	0.069	0.070	0.068	0.069	0.069
	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
Household size	-14.33***	-14.347***	-14.349***	-14.300***	-14.345***	-14.336***
	(3.523)	(3.523)	(3.522)	(3.524)	(3.523)	(3.523)
Constant	314.043**	316.705***	319.222***	319.710***	316.144**	322.417***
	(122.725)	(122.779)	(122.739)	(122.733)	(122.817)	(122.632)
Reasons for financial distress	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Annual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Monthly & annual f.e. interaction	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	35,960	35,960	35,960	35,960	35,960	35,960

Notes: Raw coefficients using OLS are reported with monthly income net of expenses as the dependent variable. ***, **, and * denote statistical significance at 1 percent, 5 percent, and 10 percent, respectively. Standard errors are in parentheses. Data include filers in propensity score matched DAs in 2005–08.