

## Access to credit after bankruptcy: Does it pay to be a deadbeat?

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February 12, 2009

VERY PRELIMINARY DRAFT

### Abstract

Conventional wisdom about individuals who have gone bankrupt is that they find it very difficult to get credit for at least some time after their bankruptcy. However, there is very little non-survey based empirical evidence on the availability of credit post-bankruptcy. This paper makes two contributions using data from one of the largest credit bureaus in the US. First, we show that individuals who file for bankruptcy can indeed get credit very quickly after they file. Second, we show that those individuals who are effectively the least punished and can get the easiest access to credit after bankruptcy tend to be the ones who have shown the least ability and propensity to repay their debt prior to declaring bankruptcy. In fact, a significant fraction of individuals at the bottom of the credit quality spectrum seem to receive *more* credit after filing than before. We interpret the widespread credit access and the difference in credit provision across borrower types as evidence that lenders target at-risk borrowers.

**JEL codes: G33, D14**

**Keywords: consumer bankruptcy, post-bankruptcy credit access**

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## Introduction

The last two decades have seen a massive increase in both consumer credit and personal bankruptcies, leading to much debate among both policy-makers and academics in an attempt to understand the sources of and the causal link between these trends. As part of this debate, there has also been much discussion about whether or not bankrupt individuals are (and should be) effectively punished and excluded from credit markets, and whether these individuals have gone bankrupt as part of a general trend of increased credit to riskier households.

While there have been many theoretical studies analyzing these questions, there is very little empirical evidence, especially regarding facts about credit access post-bankruptcy. The economics literature, in particular, the macro-quantitative models of bankruptcy mostly assume an exclusion penalty where individuals are not allowed to borrow post-bankruptcy for a given period of time. The legal literature on the other hand suggests that there is relatively easy access to credit, relying principally on survey evidence. We discuss both these lines of research in detail in the section below.

The aim of this paper is to contribute to this debate by investigating the degree to which individuals that file for personal bankruptcy have access to credit markets afterwards. To our knowledge, this is the first study of post-bankruptcy credit access based on a nationally representative sample of consumer credit information that is drawn from lenders themselves. Using panel data provided by a large US credit bureau data, we establish some basic facts about the availability of credit post-bankruptcy and provide a related discussion about the potential behavior of lenders. We focus primarily on access to unsecured lending as measured by credit limits on revolving credit lines, such as credit cards. We also limit our focus to lending by 'traditional' issuers such as banks or credit card companies, as captured by credit bureaus, and not informal credit channels, such as 'payday' loan operations.

Our findings show, first, that the average exclusion period, if it exists at all, is very short. Indeed, 90% of individuals have access to some sort of credit within the 18 months after filing for bankruptcy, and 66% have positive revolving credit. More precisely, we find that a significant proportion of the population (27.8% in our sample) actually seem to receive *more* credit after filing for bankruptcy than if they had not filed. Second, we document that this access to credit after bankruptcy is highly heterogeneous. There appears to be a strong division between individuals that had good credit histories prior to bankruptcy and those that had poor credit histories. We find that bankrupt individuals with the lowest credit scores have more access to credit than individuals with similar credit score that did not file for bankruptcy: 44% of individuals that file for bankruptcy have positive revolving credit limits in 2004, while that average is 41% for the lowest score individuals that have never filed for bankruptcy. When we further investigate the characteristics of these individuals who received more credit than expected, we find that they are on average more likely to have lower credit scores than average and live in poorer, and less educated communities. In other words, the individuals with the least ability and propensity to repay their debts prior to declaring bankruptcy and the least ability to access financial or educational resources seem more likely to experience an increase in their credit limits after filing for bankruptcy.

We interpret these findings as evidence of targeting of at-risk individuals by lenders, as consistent with a profit maximizing lender that allocates resources across different types of borrowers segmented by credit score. This interpretation is also consistent with some of the survey evidence provided by legal studies as discussed in section 2 below. However, the fact that bankrupt individuals receive more credit after filing than they would have had if they had not filed is not enough evidence for this claim on its own. Two factors are important in making this claim. First, from an economic perspective, declaring bankruptcy can provide creditors with information about a borrower's ability or willingness to repay debt; that is, it may be a predictor of the post-bankruptcy credit score. Of course, without knowledge of whether the filing was for

strategic reasons or due to an adverse event, this filing could contain differing information. As such, the bankruptcy filing may not indicate the borrower's willingness or ability to repay in the future. Nonetheless, existing credit scoring models penalize borrowers for bankruptcy: the credit score decreases by 133 points on average, which suggests a lower ability to repay debt in the future after bankruptcy, at least from a statistical basis. As we discuss below, credit scores in general are inverse ordinal rankings of risk. As a result, increasing credit lines to consumers in this category as we find, suggests a willingness to lend despite expected higher default rates. The second factor is the difference in provision of credit across the credit quality spectrum. One might imagine a business model in which lenders provide increased, but high-interest credit to anyone that enters bankruptcy. The data, however, suggest that issuers provide increased credit lines disproportionately to lower quality borrowers in particular communities. The combination of the increase in credit access and the differential provision of credit to targeted, potentially at risk, populations provide evidence for our claim. We think that either of these, on its own, provides some evidence of targeting of at-risk borrowers and the two together provide strong support for this claim.

These findings are also consistent with economic theory which would suggest that, ex-post, lenders have no incentive to punish borrowers unless bankruptcy reveals a change in their likelihood of repayment. Unfortunately, we do not observe the prices associated with these credit lines. In other words, our results show the quantity of available credit but not the cost of credit, which is clearly an important indicator of credit availability. However, this lack of information does not undermine our findings. Indeed, prices would only strengthen our results regarding the differences in credit limits available to those households who have good vs. bad credit histories. The only way that a lender would wish to lend *more* to a borrower with a *lower* probability of payment is to charge higher prices.

The primary confounding factor for interpreting these findings is how to disentangle the demand by borrowers from credit supply by lenders. For example, well-educated individuals and/or those with good credit histories may be better at reading the fine print on solicitations, and potentially less likely to accept credit limits at any cost. Though this could plausibly explain quantitative differences in credit limits post bankruptcy it leaves unchanged our conclusion of targeting at-risk borrowers in the sense that there is no stable equilibrium in which lenders soliciting equally across credit category but receive responses only from low credit quality individuals. We discuss this further in the last section.

The remainder of the paper is organized as follows. In section 2 we provide a short summary of the economics and legal literature on personal bankruptcy. Both these literature reviews are limited in scope, but intended to provide a baseline for our discussion. Section 3 discusses our dataset, while section 4 describes the methodology we use to assess credit availability and bankruptcy penalty, and our results. In section 6 we provide a general discussion of these results together with a summary of potential caveats. Section 7 concludes the paper.

## **1. Literature on Personal Bankruptcy**

### **Economics Literature**

Following the dramatic rise in bankruptcies over the last couple of decades and the surrounding policy discussions, many researchers have attempted to study household bankruptcy decisions and tried to explain the sources and the links between increasing consumer lending and defaults. In doing so, economists have mainly relied on quantitative macroeconomic models, and to a smaller degree on applied analyses that exploit different sources of micro data.

The quantitative macroeconomic models are part of a recent literature on equilibrium models of consumer bankruptcy. Examples include Athreya (2002, 2004), Chatterjee et al. (2007), and Livshits et al. (2007), which comprise of dynamic equilibrium models where interest rates vary

with borrowers' characteristics.<sup>1</sup> Almost all of these models assume the presence of a market exclusion following default. The existence of such an exclusion penalty facilitates these quantitative macro models in a number of ways. Most importantly, by imposing the presence of a non-renegotiable ex-ante exclusion, the models rule out moral hazard problems. Agents cannot accumulate assets with the explicit intention of expunging debt and then acquiring new debt. Of course, debt renegotiation does occur and nothing prevents a credit issuer from providing credit to a bankrupt ex-post. The presence of an exclusion serves as a reasonable assumption that captures a type of well quantified 'punishment' for bankrupts and allows researchers to calibrate a cost associated with bankruptcy. Such costs are a key to generating realistic solutions to models where households trade-off such costs against the benefit from a fresh-start (discharge of their debt). Similarly, another motivation for the exclusion assumption in these models is the fact that US Law<sup>2</sup> prevents repeat bankruptcies within an 8 year period and that bankruptcy of an individual is kept on their credit history records for 10 years.<sup>3</sup>

More recently, however, there has been increased discussion about whether these assumptions are realistic, followed by a move away from reliance on such assumptions. For example, Athreya and Janicki (2006) evaluate "the commonly used (but rarely justified) assumption" that bankrupt individuals get excluded from unsecured credit markets, as well as examine the quantitative role of exclusion in explaining the surge in both consumer debt and personal bankruptcies. They conclude that such an assumption is hard to justify from a theoretical perspective, especially without a better understanding of the income shocks households face—a key determinant of bankruptcies. This is because lenders have no incentive to punish borrowers after bankruptcy unless bankruptcy reveals a change in their likelihood of repayment. Accordingly, only in the case of small or primarily transitory shocks that exclusion penalties would have the most effect as the option-value to borrow is much less when facing a permanent shock.

On the applied analyses front, there are only a handful of studies, primarily due to lack of suitable data. Stavins (2000) examines the relationship between consumer credit card borrowing, delinquency rates, and personal bankruptcies. She finds that having been turned down for credit makes one substantially more likely to have filed for bankruptcy in the past. Similarly, bankruptcy filers are less likely to hold at least one credit card. While both of these observations are suggestive, they do not have an unambiguous interpretation of "exclusion" from credit markets. The extent of this exclusion is especially questionable given her finding that the average number of credit cards held by those with a past bankruptcy was 2.91 compared to 3.58 for those without a bankruptcy. One of the most interesting findings in Stavins (2000) is that the individuals with prior bankruptcies have higher delinquency rates than the rest of the population, a finding that is suggestive of the systemically different characterization of bankrupt individuals.

Musto (2004) and Fisher, Filer and Lyons (2000) provide other evidence in support of an exclusion period. Musto (2004) analyzes the impact of the removal of the bankruptcy record from an individual's credit record and shows that especially the credit-worthy individuals get more cards and see big jumps in their credit limits. Indeed, such a finding is consistent with our results in that the high-credit individuals here see a relatively larger 'penalty' and can thus have larger increases at the time the bankruptcy flag is removed from the record. Using a panel study of households, Fisher, Filer, and Lyons (2000) show that consumption of the bankrupt households

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<sup>1</sup> It's worth noting that such exclusion-penalty assumptions are not exclusive to the personal finance realm. Yue (2005), Aguiar and Gopinath (2005), and Saprizza and Cuadra (2005) use it in the sovereign context with very similar logic.

<sup>2</sup> 11 U.S.C.A. § 727(a)(8) prohibits grant of discharge if debtor received a discharge in the eight years preceding the current filing.

<sup>3</sup> The relevant federal law is the Fair Credit Reporting Act. See 15 U.S.C. § 1681c(a)(1).

depict higher sensitivity to their incomes than in the period preceding the filing, which is consistent with binding borrowing constraints in the post-bankruptcy period.

Unfortunately, these theoretical arguments or the indirect nature of the evidence so far presented in empirical studies limit our ability to have a solid understanding of the basic facts surrounding households' credit access after bankruptcy, a gap this paper hopes to fill.

### **Legal Literature**

Outside of the economics literature, legal studies on post-bankruptcy rely primarily on available survey data to describe the exclusion patterns. That said, the legal literature has produced a wide range of work on bankruptcy. Among these works is a long-running debate over whether bankruptcy filings are strategically motivated or caused by unexpected external events. Among others Block-Lieb and Janger (2006), Sullivan et al (2006) and Weiner et al (2005) find support for the latter explanation for most bankruptcy filings. A comprehensive overview is available in Porter and Thorne (2006) and Porter (2008). Porter (2006) also uses data from the 2001 consumer bankruptcy project, a survey of a few thousands individuals experience before and after bankruptcy to provide some statistics on market exclusion and to opine on the reasons for bankruptcy.

In a seminal study that preceded the large 1973 change in the US bankruptcy code, Stanley et al (1971) interviewed a small sample of people, and, notably found that credit was relatively easy to come by post bankruptcy. Among the literature that has found evidence of access on post 1973 data, Porter (2008) finds that a very high percentage of individuals being offered unsecured lines of credit within a year of going bankrupt. As well, she finds support for the 'adverse event' theory of bankruptcy. She also notes that little prior empirical work has been done, but that a number of authors have cited the need for more data and evidence on the topic (see Braucher (2004) and Jacoby (2005)). In other work, Staten (1993) looks at the role of post-bankruptcy credit on the number of bankruptcies. He draws his data from a survey as well, and finds that one year post bankruptcy, 16.2 percent got new credit. Three years after, 38.6 percent obtained credit. About half of each came in installment and revolving debt. However, highlighting the problems with surveys and sample size, these numbers are quite different from the Porter (2008) results.

The background to the literature directly on post-bankruptcy lending is the work that has found that the changes in the bankruptcy code enacted in 2005 made consumer bankruptcy more difficult to obtain, and more expensive for the filer both in terms of filing costs and time allocation (Mann 2007, Sommer 2005).

Our question is about lending to consumers who have already filed for bankruptcy. Porter (2008) describes the criteria that should apply, "If even a modest proportion of bankruptcy debtors are untrustworthy deadbeats who behave in immoral or strategic ways, the credit industry should be reluctant to lend to these families." Indeed, individuals with low credit scores, defined as those individuals who have been unreliable in repayment of debts, should not typically be a target of credit issuance. In a story that is consistent with our findings, Porter (2008), using a longitudinal study of bankrupt individuals, finds evidence that consumers are 'bombarded' with credit offers, including from the very issuers that have just had debts expunged. Overlain with this motive is evidence that more than a third of families post bankruptcy had worsening financial conditions, even accounting for the bankruptcy discharge (Porter and Thorne, 2006).

Why would issuers pursue a strategy to lend to borrowers with worsening financial conditions? Porter (2008) and Mann (2007) argue that issuers stand to profit by charging sufficiently high interest rates, large fees and by trapping consumers in a debt trap. Broadly speaking the *trap* is that consumers, even at high interest rates, can pay interest on existing debt obligations using new credit. This, of course leads to higher debt and an increased chance that future payments will need to be met with new credit as well. At high enough rates, issuers can profit from borrowers that *never* repay initial principal. Consider the following example. John borrows \$500 at 20% interest on a credit card. In the event that John misses a payment, his rate

will change to 30% for the duration of the debt, plus a late fee of \$39 for each missed payment. John is late on average 3 times a year. Thus, interest and fees on Jon's debt average \$267. Principal payments are typically 2% (\$10) per month. If John pays the principal payment and half the interest and fees in cash and finances the rest, his debt after a year will actually grow by \$13.<sup>4</sup>

While these results are based on surveys alone, the patterns are largely consistent with our findings.

## 2. Data

Our analysis is based on a unique, very large proprietary data set provided by one of the three major credit bureaus in the US. The data are drawn from geographically stratified random samples of individuals, and include information on variables commonly available in a personal credit report. In particular, the file includes age, a variety of account and credit quality information such as the number of open accounts, defaulted accounts, current and past delinquencies, size of missed payments, credit lines, credit balances, etc. The information spans all credit lines, from mortgages, bank cards, installment loans to department store accounts. The credit bureau also provides a summary measure of default risk—an internal credit score. As is customary, account files have been purged of names, social security numbers, and addresses to ensure individual confidentiality.

The primary data were drawn from two periods in time with an 18 month interval—June 2003 and December 2004—comprising a very large repeated panel with about 270,000 individuals. One of the key advantages of these data is that it includes a measure of credit risk. For each individual, the data provider includes information on a credit score. Credit scores in general are inverse ordinal rankings of risk. That is, an individual with a credit score of 200 is viewed to have higher risk of default than an individual of score 201. However, the difference in risk between 200 and 201 may or may not be equal to the change from 201 to 202. Having information on credit quality allows us to answer some of the outstanding questions more accurately than has been done to date. Importantly, the data set also includes information on individual public bankruptcy filings. Our key variable of interest is revolving credit line limits, though we also consider availability of secured lending in section 6. Unfortunately, we do not observe and therefore are not able to comment on the “price” or cost of available credit to these individuals, which are likely to be an important indicator. Nonetheless, we believe our results are still informative and provide the first direct evidence on credit access of bankrupt individuals.

For the analysis we drop individuals that have a total credit limit smaller than \$1,000 in year 2003. We define two sub samples. The first one is the sample of individuals that have never filed for bankruptcy in 2003 or 2004, comprising 135,122 individuals with complete information. Second, we construct the sub sample of individuals that go bankrupt between the two observation periods by selecting the individuals that have filed for bankruptcy in 2004 but did not in 2003 and drop individuals that in 2004 report more than 18 months since last derogatory public record. Indeed, the number of months permits to analyze the evolution of credit after bankruptcy across individuals.

Finally, we also use a larger and more recent panel dataset we have from the same credit bureau. This panel is drawn in June 2006 and December 2007, and helps us to analyze whether there might have been changes in credit markets, especially as we entered the slow-down in this 2007/2008 crisis. In other words, we use this latter element to see whether the associated penalty with bankruptcy—the ease at which bankrupt individuals can get credit has changed between the

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<sup>4</sup> See Block-Lieb and Janger (2006) for an articulation of this argument. Broadly speaking, they find that issuers pursue this strategy based on ability to target populations carefully such that individuals with strategically incur debt and default are a sufficiently small percentage and outweighed by a large percentage of individuals that carry debt at high interest rates and thus profit margins.

credit boom period of 2003/2004 and the slow-down in 2007. Unfortunately matching the two data sets is not possible due to differences in some of the available information and the fact that we do not have a common unique identifier between the two sets, and limits our analysis to a comparison of two time periods as opposed to four.

### 3.1. Descriptive statistics

Table 1 provides the summary statistics for the variables used in our analysis. Table 2 provides more detailed descriptive statistics on the average credit limit by credit score brackets for the whole sample (Panel A), for the sub-sample of individuals that never filed for bankruptcy (Panel B), and for the sub-sample that file for bankruptcy (Panel C). In Panel C we can see that individuals with the lowest credit score (<300) have the lowest credit limit both before and after filing for bankruptcy, as expected: \$3,200 and \$1,200 in 2003 and 2004 respectively. Access to credit, measured by the percentage of individuals with positive credit limit in 2004, is increasing with pre-bankruptcy credit score: 44% of individuals in the lowest credit score bracket have access to credit compared to an overall average of 92%. However, bankrupt individuals in the lowest score bracket have nearly identical revolving credit limits when compared to individuals with similar scores that do not file for bankruptcy (both approximately \$1,200). Also note that a significant fraction of the lowest credit score, bankrupt individuals (12%) experience an absolute increase in their credit limit.

## 3. Empirical Methodology and Results

### 4.1 Estimation of the bankruptcy penalty

We define the bankruptcy penalty as the difference in credit limit available to individuals that have filed for bankruptcy with respect to the credit limit that would have been available to them had they not filed for bankruptcy. This requires the estimation of a counterfactual credit limit for individuals that file for bankruptcy. We exploit the time dimension of our dataset to estimate the bankruptcy penalty of those individuals that file for bankruptcy sometime between June 2003 and December 2004 (our two observation times). We proceed in three steps. First, using the sample of individuals that have never filed for bankruptcy in 2003 or 2004, we estimate the following model for the availability of credit in 2004 using observables in 2003 the results of which are provided in Table 3:

$$(1) \text{Credit}_{2004_i} = \beta \text{Credit}_{2003_i} + \beta X_{2003_i} + u_i, \text{ for all } i \text{ that never filed for bankruptcy, where } X_{2003} = \text{age, number cards, census variables (income, race, etc.)}$$

Using model (1), we predict the credit limit in 2004 for individuals that have filed for bankruptcy in 2004 but did not in 2003. This is the counterfactual: estimated credit limit that would have been available in 2004 if they had not filed for bankruptcy, conditional on their observable characteristics in 2003.

$$(2) \text{Pred\_Limit}_{2004_i} = \hat{\beta} \text{Limit}_{2003_i} + \hat{\beta} X_{2003_i}, \text{ if bankruptcy in 2004}$$

Next, we estimate the bankruptcy penalty for individuals that filed for bankruptcy between 2003 and 2004 by subtracting the estimated credit limit in (2) from the actual observed credit limit in 2004.

$$(3) \text{Bankruptcy Penalty}_i = \text{Limit}_{2004_i} - \text{Pred\_Limit}_{2004_i}, \text{ if bankruptcy in 2004}$$

The bankruptcy penalty is negative when individuals obtain less credit after bankruptcy with respect to the credit limit they would have had if they did not file. We also compute the bankruptcy penalty relative to the initial credit limit in 2003:

$$(4) \text{ Bankruptcy Penalty Ratio} = \text{Bankruptcy Penalty}_i / \text{Limit}_{2003_i}$$

We focus on revolving credit because unsecured credit is the one that is discharged during bankruptcy, and therefore, we expect the larger bankruptcy effects to be shown for this type of credit.

## 4.2 Results

Figure 1 plots the average bankruptcy penalty against months since most recent derogatory public record, which includes bankruptcy filings. We observe a U-shaped pattern, with a decrease in available revolving credit during the first six months after filing for bankruptcy, as would be expected. The credit limit loss reaches its maximum five months after bankruptcy and is on average \$21,000 at that point. After that, the penalty gets smaller and approaches \$10,000 on average at 18 months after bankruptcy. Unfortunately, we cannot calculate the penalty beyond 18 months after bankruptcy due to data limitations. Similarly, notice also that the observed decline in the first months may just reflect the reporting lag to the credit bureau.

While on average a bankrupt individual faces a significant (albeit temporary) drop in available credit there is quite a bit of heterogeneity behind the average plotted in Figure 1. Figure 2 uncovers this heterogeneity. On the one hand, we observe that for a significant fraction of individuals (23.8%) the bankruptcy penalty is indeed positive, meaning that they actually get more credit than predicted by model (1). On the other hand, it shows that for the majority of individuals the penalty is negative and for some of them is substantial—approaching \$90,000 lost in revolving credit. We attempt to identify and discuss the factors that explain these different patterns of access to credit post bankruptcy in the next section.

In Table 4 we can see that individuals with the lowest credit score (<300) have on average a positive bankruptcy penalty, which is a \$300 increase in revolving credit. Compared to an average credit limit before bankruptcy of \$3,200, this increase is relatively small. In fact, the average bankruptcy penalty ratio is *positive* and equal to 173%, meaning that individuals obtain more credit after bankruptcy with respect to the credit limit they would have if they did not file. In total, 65% of individuals in the lowest credit score group have a *positive* bankruptcy penalty.

In order to better understand the determinants of having a positive or a negative penalty, we provide a cross tabulation of the credit score, credit limits and utilization rate with the bankruptcy penalty in Table 5. This table shows that individuals with positive penalty have on average lower credit scores, lower credit limits and higher utilization rates. Combining data from the US Census on characteristics of the neighborhoods of these individuals, Table 6 shows that individuals with positive penalty tend to live in poorer areas, with higher divorce rate, more blacks, and lower home valuations.

As a preliminary test of whether these trends in credit access may have changed, we compare the mean and median bankruptcy penalty in terms of total credit limit and revolving credit limit in 2003–04 against 2006–07 values in Table 7. Interestingly, this table shows that during the credit boom of 2003–04 the bankruptcy penalty was substantially lower compared to December 2007 as the current credit crisis was unfolding and credit standards became tighter. This is particularly true for individuals with the lowest credit scores. For individuals with high credit score in 2003, the bankruptcy penalty is similar in both years (and is even smaller in relative terms—variable % difference). We interpret this as evidence that the targeting we observe in the data is partially a function of the assessment of default probabilities of low credit score borrowers. Even with high interest rates and large fees, issuers need a substantial fraction of low credit quality borrowers to



pay for some period of time. If the default probabilities increase, as in the current economic crisis, this can affect lending to the cross section of borrowers.

#### **4. A Discussion of our results and associated potential caveats**

There are a number of possible reasons for the presence of rapid re-entry into the credit markets after bankruptcy. Without any moral hazard concerns, a bankrupt that is prevented from going bankrupt again by law but whose repayment habits have not changed is a *better* credit risk than the same borrower pre-bankruptcy. Similarly, if individuals face unexpected negative shocks which impair their ability to repay, lenders would stand to gain from renegotiating their debt. Once debt has been expunged, both the borrower and new lenders stand to gain from new relationships. Finally, borrowers that have suffered large but transitory shocks and declared bankruptcy may be willing to pay high rates to access credit markets in the meantime to smooth their consumption. These are all possible explanations that are consistent with the observed short exclusion period in the data.

We argue that the phenomenon can also be explained with a simple story. With the ability to condition on other credit characteristics (e.g. timeliness of payment), lenders can pool borrowers into two groups. First, a group that went bankrupt due to recurrent mismanagement of their accounts, and second, a group that faced some idiosyncratic negative shock (health, divorce, etc.). While both groups are now better risks in the sense that they cannot re-file for bankruptcy in the short term, the former group will show a much larger change in their riskiness. Since individuals in this category, all things equal, would be much more likely to file for bankruptcy again given their credit patterns, an exclusion from re-filing would be much more important than to other groups. This exclusion is critical to the lenders because it enables a change in underwriting to permit lending to ex-ante riskier or distressed borrowers. As such, bankruptcy serves as a segmentation tool which, on average, leads to relatively small credit access reductions. Indeed, the former group, the ex-ante low credit quality individuals, receives more credit than predicted by the model. We interpret this as evidence of targeting at-risk borrowers.

##### **Potential caveats**

Unfortunately, there are a few factors that confound our interpretation of these observed facts. The most important among these is the identification of supply vs. demand effects. Recall that one of our central findings is that individuals with higher ex-ante credit scores face a larger credit penalty on average. One potential explanation for this might be because individuals who historically had good credit records but ended up in bankruptcy have suffered from a persistent income shock or that they are more likely to have defaulted strategically. Both of these possibilities would explain both a decrease in a lender's willingness to lend to such individuals and a decrease in the demand of these individuals for credit. After all, individuals would be more likely to reduce their consumption and reliance on borrowing in the face of permanent income shocks. However, this, on its own cannot explain the *differential* issuance of credit observed, unless there is reason to believe that the ex-ante low credit-score individuals are more likely to face frequent but temporary shocks. In other words, in absence of knowing whether and why bankruptcy might be signaling a difference in the nature of the shocks received by individuals at different end of the credit quality spectrum, it is hard to conclude if the observed differential credit access is driven by supply or demand.

Similarly, it may well be that, well-educated individuals and/or those with ex-ante good credit histories are better at reading the fine print on solicitations they receive compared to others, and less likely to accept credit limits at any cost. Accordingly, lenders might well be targeting all bankrupt individuals but only those with low-credit scores accept the offers, explaining the observed patterns in our data. However, this explanation is harder to justify in an equilibrium framework, where you would expect lenders to respond to an environment in which they

soliciting equally across all risk-types but receive responses only from the low credit quality individuals.

Despite the fact that we cannot disentangle these demand factors from supply and even if the *differential* access is due to differences in demand, our initial finding about the provision of credit across the board still suggests that lenders seem to target bankrupt individuals. In other words, whether lenders are targeting at-risk, certain sub-groups of individuals or not, they certainly do not seem to be shy about lending to individuals shortly after bankruptcy. This is consistent with the survey evidence provided by Porter (2006) on targeted solicitations of recently bankrupt individuals by lenders, as discussed in section 2.

A second potential pitfall in our interpretation is that the observed small and differential change in access to credit may be due to the fact that individuals use different forms of credit after bankruptcy, and looking at revolving credit alone may be misleading. This could manifest in two ways. We may observe relatively high access to revolving, unsecured credit because issuers have maintained these lines at the expense of other types of credit. Alternatively, one may observe differential changes in access if the composition of demand by type of credit changes as a function of credit quality. For example, if low-risk individuals are more likely to apply for credit cards, and high-risk individuals for auto-loans.

Accordingly, we repeat our analysis for other types of credit—mortgages, installments loans, including auto-loans, and total credit. Figure 6 presents the results from this exercise and shows no evidence of the composition effects mentioned above, and shows that total credit and mortgages follow a similar pattern to those observed using revolving credit alone. Having said so, interpreting the changes in secured lines, such as mortgages, is difficult especially because only unsecured debt is discharged in bankruptcy and not secured loans. Nonetheless, it is interesting that installment credit shows a different picture: compared to the counterfactual scenario of no-bankruptcy, installment credit drops significantly right after filing, and does not seem to recover within the same 18-month framework observed before. This is again consistent with the patterns reported in Porter (2008) for secured lending, and is likely driven by other supply factors, such as differences in underwriting standards between secured vs. unsecured loans.

However, the fact that unsecured lending recovers faster than secured remains a puzzle. One would expect that secured lending, which is generally considered to be a lower risk channel, to recover more quickly in a high-risk context. We encourage future research on this topic.

## 5. Conclusion

This paper presents, to our knowledge, the first direct evidence on credit access of individuals post-bankruptcy, a topic that generated much discussion and speculation in the economics and other literatures. In particular we first show that while individuals do see significant drops in their credit lines immediately after they file for bankruptcy (probably as their debt gets discharged), they seem to be able to regain access to credit very soon thereafter. Second, we show that those individuals who are effectively the least punished and can get the easiest access to credit afterwards tend to be the ones who have shown the least ability and propensity to repay their debt prior to declaring bankruptcy. In fact, a significant fraction of individuals at the bottom of the credit quality spectrum seem to receive *more* credit after filing than before.

We interpret this increase in credit access in general and the difference in credit provision across borrower types as evidence that lenders target at-risk borrowers. However, we do need more analysis to resolve some of the confounding issues to have a clearer and stronger picture. In particular, we need a better understanding of the nature of income shocks or other factors that derive an individual's bankruptcy decision. After all, such an understanding is the key to the question about whether bankruptcy reveals a change in an individual's future repayment behavior.

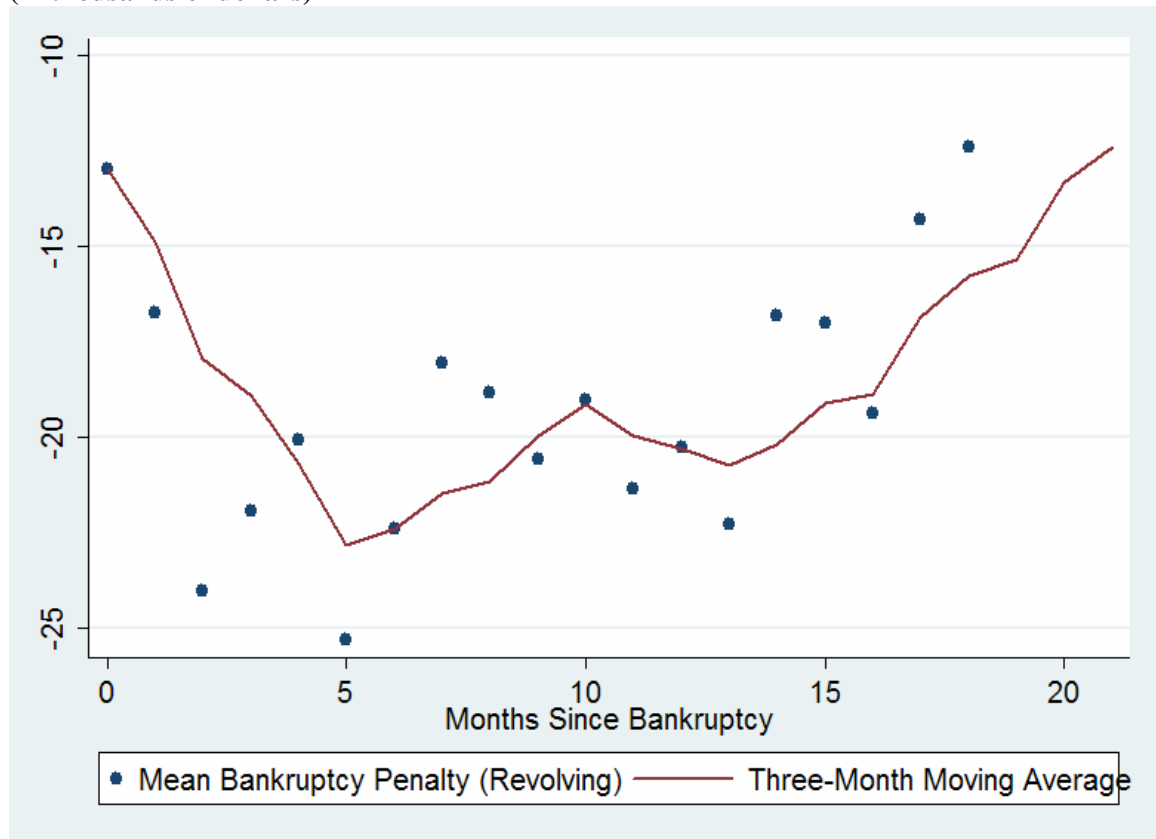
Similarly, using longer time-series data it will be interesting to see how the exclusion penalty might have changed over the last couple decades and whether credit availability for recently

bankrupt individuals will change as part of the ever changing landscape associated with the current financial turmoil, as hinted by some of our results based on limited data from 2007.

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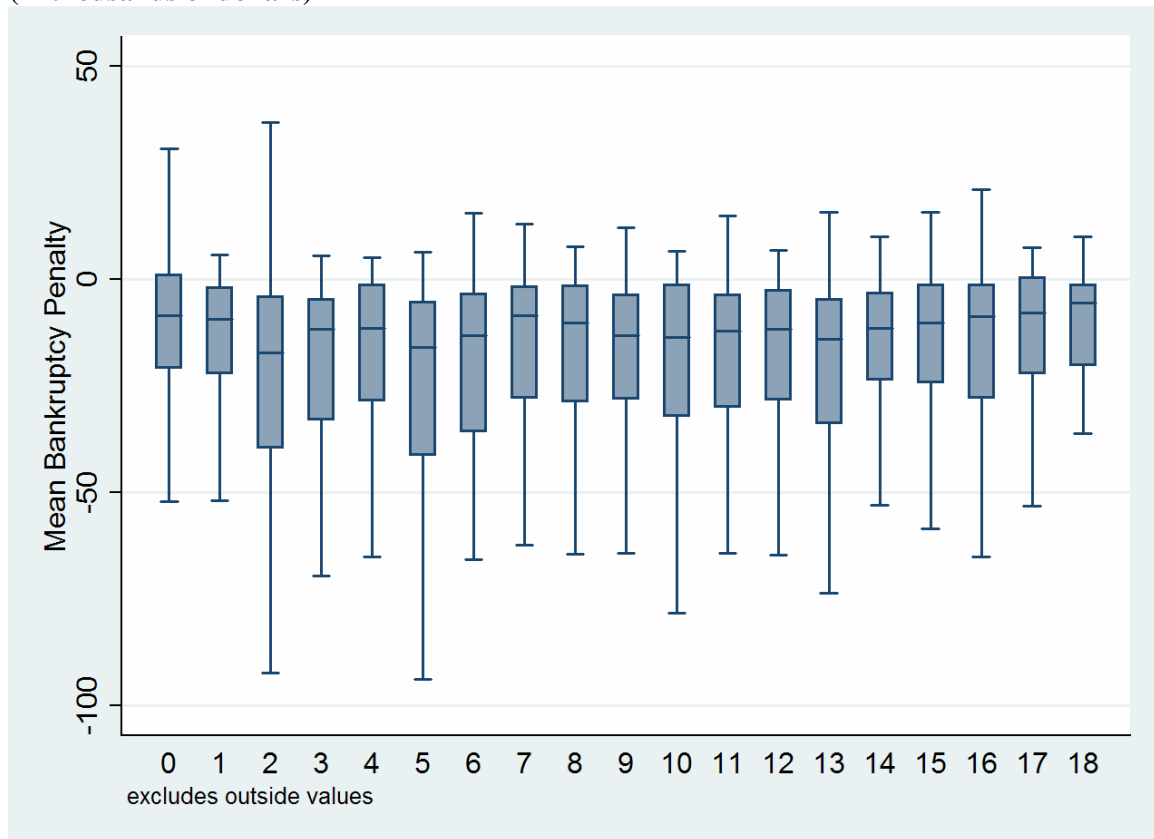
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**FIGURE 1: AVERAGE BANKRUPTCY PENALTY BY MONTHS SINCE FILING**  
(in thousands of dollars)



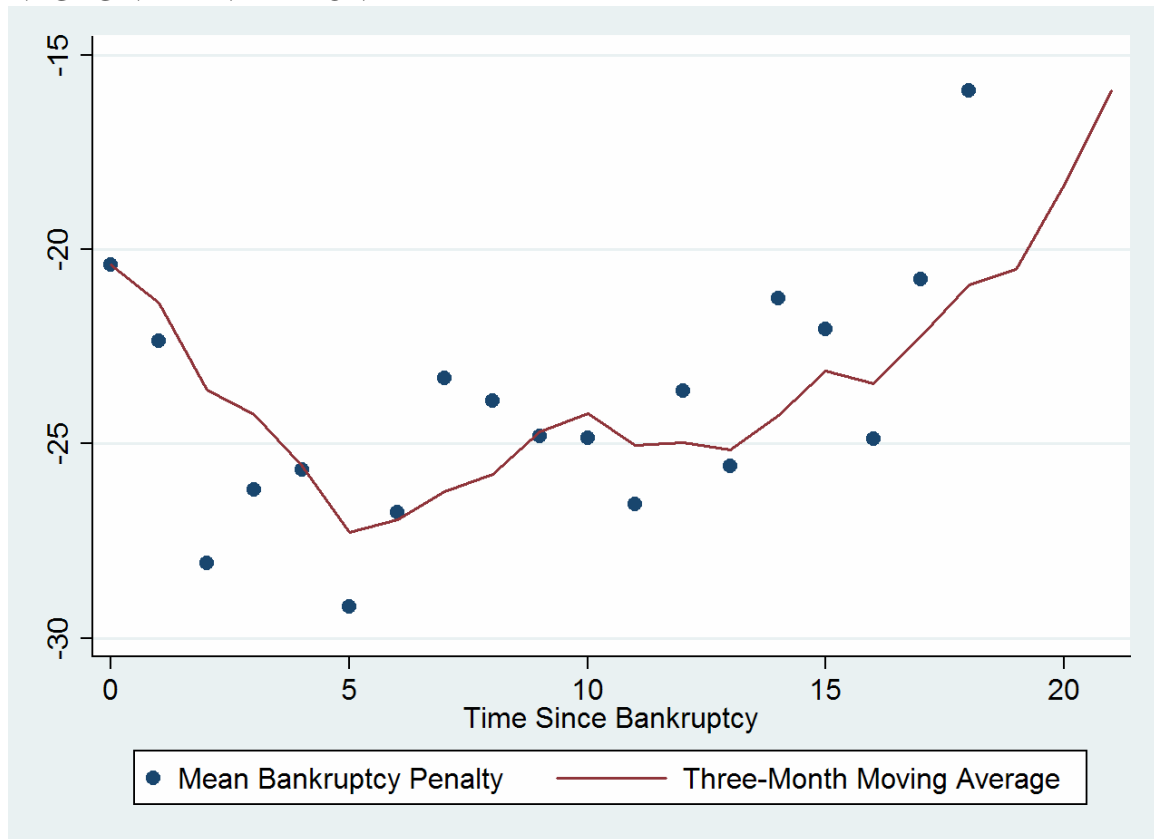
Note: Solid line indicates 3-month moving average, dots indicate the average bankruptcy penalty if filed by bankruptcy X months ago. Methodology for calculating the penalty is discussed in Section 4. X-axis indicates time since bankruptcy. Y-axis indicates change in credit available versus counterfactual of similar individuals who did not declare bankruptcy in thousands of dollars.

**FIGURE 2: BANKRUPTCY PENALTY BY MONTHS SINCE FILING**  
(in thousands of dollars)



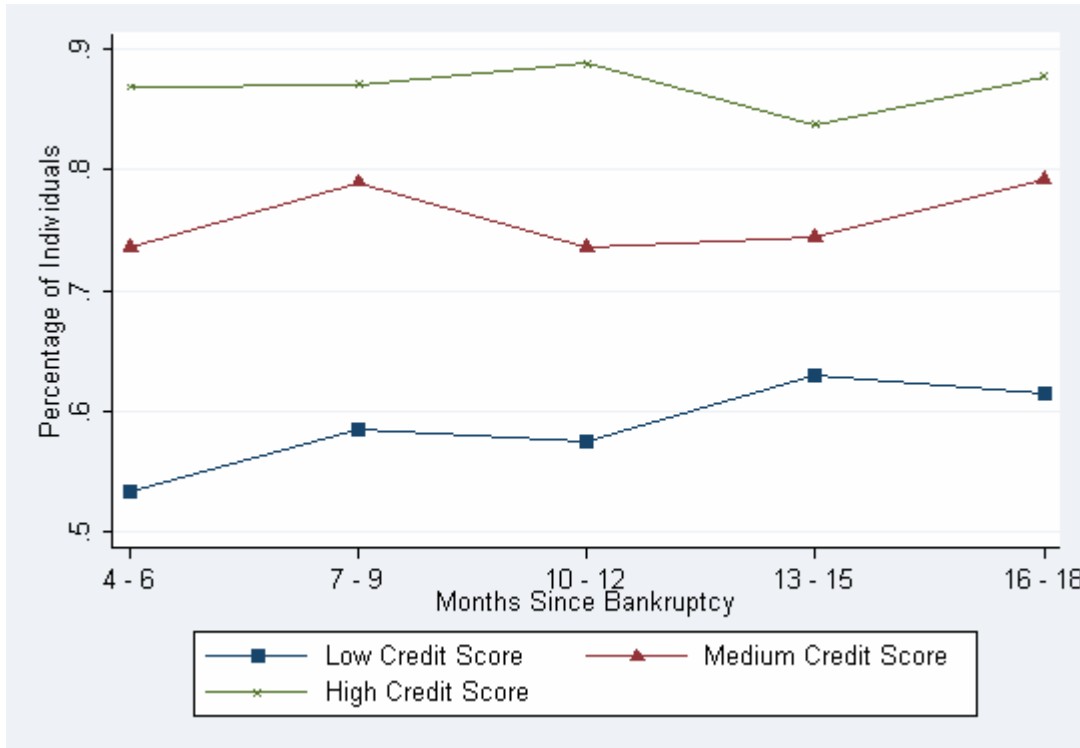
Note: Methodology for calculating penalty is discussed in text of paper. X-axis indicates time since bankruptcy. Y-axis indicates change in credit available versus counterfactual of similar individuals who did not declare bankruptcy in thousands of dollars. Boxed areas indicates the range from the 25<sup>th</sup> to 75<sup>th</sup> quantile. The lines indicate the remainder of the range in each case.

**FIGURE 3: BANKRUPTCY PENALTY BY MONTHS SINCE FILING:  
NEGATIVE PENALTY ONLY**



Note: Solid line indicates 3-month moving average, dots indicate the average bankruptcy penalty if filed by bankruptcy X months ago. Figure includes only individuals with a 'negative' penalty; that is, those who had less access to credit after declaring. Methodology for calculating the penalty is discussed in Section 4. X-axis indicates time since bankruptcy. Y-axis indicates change in credit available versus counterfactual of similar individuals who did not declare bankruptcy in thousands of dollars.

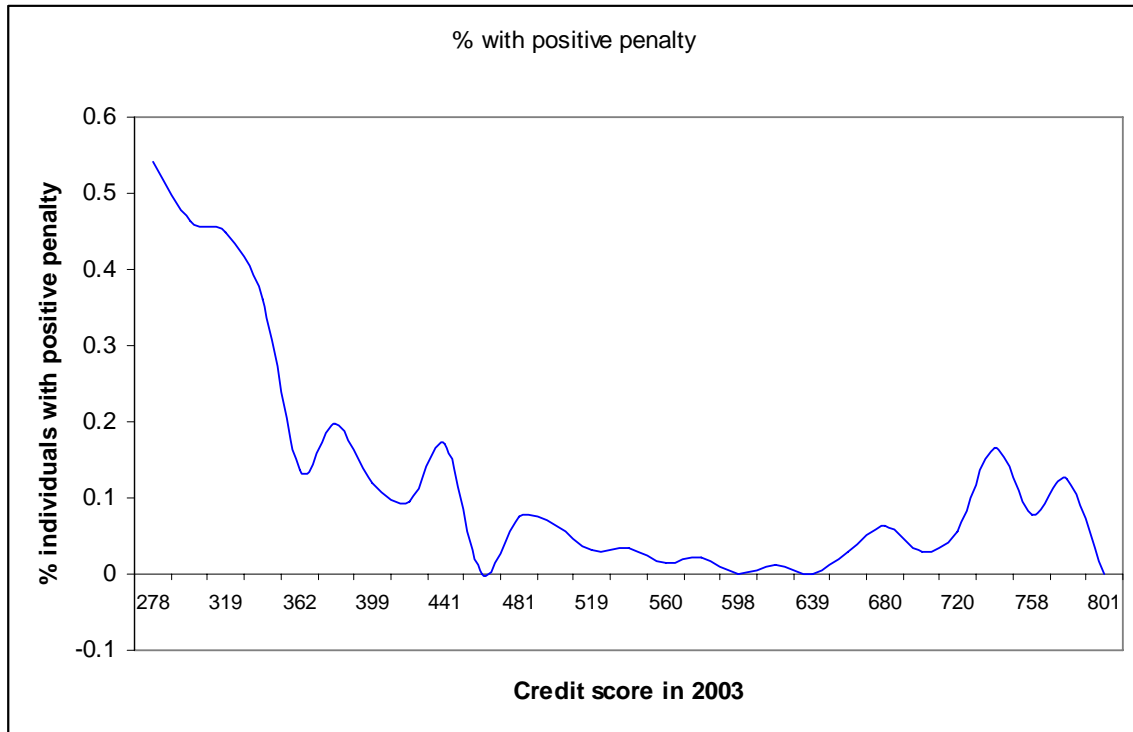
**FIGURE 4: % INDIVIDUALS WITH POSITIVE CREDIT BY CREDIT SCORE AND MONTHS SINCE FILING**



Note: Each observation indicates the percentages of individuals with more than \$1 of revolving credit available. The lines divide the sample by credit quality. The light green line with 'x' markers are individuals with high credit scores (above 510), the red line with triangle markers are average scores (between 340 and 510) and the blue line with boxes are those with low scores (below 340). The x-axis indicates time since bankruptcy and the y-axis the percentage of individuals in each group.



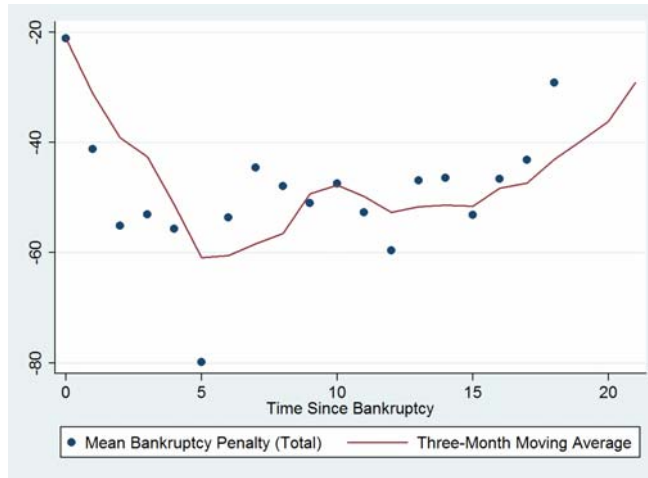
**FIGURE 5: % INDIVIDUALS WITH *INCREASE* IN COUNTERFACTUAL CREDIT FOLLOWING BANKRUPTCY (POSITIVE PENALTY)**



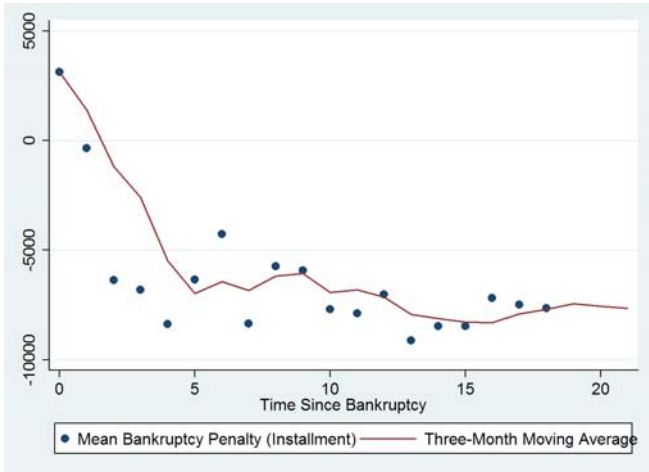
Note: The figure shows the number of individuals who had more credit than would have otherwise have been available divided by the total number declaring bankruptcy. The x-axis shows binned credit scores.

**FIGURE 6: AVERAGE BANKRUPTCY PENALTY BY TYPES OF CREDIT  
(in thousands of dollars)**

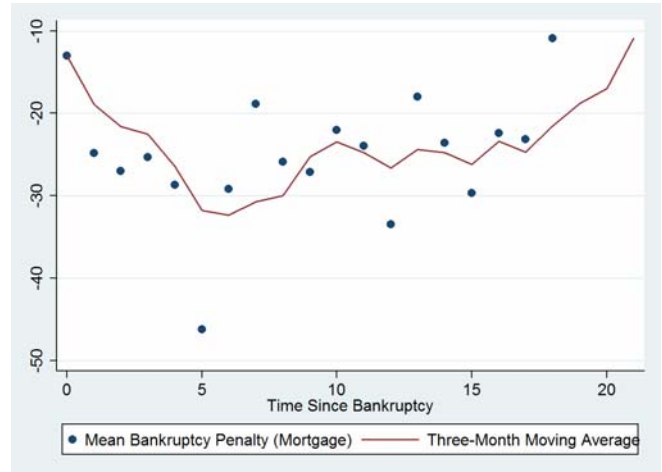
PANEL A: TOTAL CREDIT LIMIT



PANEL B: INSTALLMENT CREDIT LIMIT



PANEL C: MORTGAGE LIMIT



Note: Solid line indicates 3-month moving average, dots indicate the average bankruptcy penalty if filed by bankruptcy X months ago. Methodology for calculating the penalty is discussed in Section 4. X-axis indicates time since bankruptcy. Y-axis indicates change in credit available versus counterfactual of similar individuals who did not declare bankruptcy in thousands of dollars.

**TABLE 1: SUMMARY STATISTICS**

| VARIABLES   | COMPLETE SAMPLE |         | NON-BANKRUPT INDIVIDUALS |         | BANKRUPT I |
|---|-----------------|---------|--------------------------|---------|------------|
|   | MEAN            | SD      | MEAN                     | SD      | MEAN       |
| Age   | 48.5            | 17.5    | 48.6                     | 17.6    | 43.4       |
| Divorced (% females in 1 mile radius)                             | 10.7            | 3.92    | 10.7                     | 3.92    | 11.8       |
| Divorced (% males in 1 mile radius)                               | 8.41            | 3.50    | 8.40                     | 3.50    | 9.58       |
| Equivalent of High School (% females in 1 mile radius)            | 29.0            | 9.81    | 29.0                     | 9.81    | 31.1       |
| Equivalent of High School (% males in 1 mile radius)              | 26.6            | 10.9    | 26.6                     | 10.9    | 29.5       |
| Greater Than High School Equivalency (% females in 1 mile radius) | 53.6            | 16.6    | 53.6                     | 16.6    | 48.8       |
| Greater Than High School Equivalency (% males in 1 mile radius)   | 55.9            | 18.9    | 55.9                     | 18.9    | 50.1       |
| House Value (\$ thousands)  | 143             | 93.6    | 143                      | 93.8    | 112        |
| Median Gross Rent   | 688             | 266     | 689                      | 266     | 623        |
| Non-married (% females in 1 mile radius)                          | 23.5            | 9.49    | 23.5                     | 9.49    | 23.9       |
| Non-married (% males in 1 mile radius)                            | 29.4            | 10.0    | 29.4                     | 10.0    | 30.1       |
| Black (% in 1 mile radius)  | 9.95            | 17.6    | 9.88                     | 17.5    | 15.0       |
| Foreign Born (% in 1 mile radius)                                 | 10.7            | 12.3    | 10.7                     | 12.3    | 9.08       |
| Homes with Mortgages (% in 1 mile radius)                         | 70.7            | 13.4    | 70.7                     | 13.4    | 70.3       |
| Public Assistance (% in 1 mile radius)                            | 3.00            | 3.14    | 2.99                     | 3.14    | 3.71       |
| Owner Occupied Homes (% in 1 mile radius)                         | 68.1            | 20.1    | 68.1                     | 20.1    | 66.6       |
| Positive Earnings (% in 1 mile radius)                            | 81.5            | 9.10    | 81.5                     | 9.10    | 80.7       |
| Widowed (% males in 1 mile radius)                                | 10.3            | 4.86    | 10.3                     | 4.86    | 10.7       |
| Widowed (% males in 1 mile radius)                                | 2.49            | 1.63    | 2.49                     | 1.63    | 2.64       |
| Credit Score  | 652             | 143     | 655                      | 141     | 442        |
| First Bankruptcy Between 2003-2004 (% of sample)                  | 1.33            | 11.5    | -                        | -       | -          |
| Installment Credit Limit (\$ thousands)                           | 13.9            | 21.4    | 13.7                     | 21.3    | 22.1       |
| Mortgage Limit (\$ thousands)                                     | 44.4            | 71.1    | 44.5                     | 71.3    | 40.1       |
| Number of Currently Active Bank Cards                             | 1.67            | 1.67    | 1.66                     | 1.65    | 2.35       |
| Revolving Credit Limit (2003)                                     | 31.4            | 33.0    | 31.6                     | 33.0    | 19.7       |
| Revolving Credit Limit (2004)                                     | 36.2            | 44.9    | 36.7                     | 45.0    | 4.5        |
| Total Credit Limit (\$ thousands)                                 | 89.7            | 91.0    | 89.8                     | 91.2    | 81.9       |
| Number of observations  | 136,945         | 136,945 | 135,122                  | 135,122 | 1,823      |

Notes: Based on authors' calculations using credit bureau data, Census and other information as described in the text. All data pertains to the year 2003, the year prior to the bankruptcy, unless other

INDIVIDUALS

SD

13.8  
3.73  
3.51  
9.02  
9.9  
15.2  
17.4  
65.0  
221  
9.00  
9.5  
23.8  
11.7  
13.8  
3.40  
18.6  
9.10  
4.88  
1.72  
134  
-  
25.9  
62.5  
2.60  
26.6  
10.9  
79.0

1,823

wise specified

**TABLE 2: CREDIT STATISTICS BY CREDIT SCORE (REVOLVING CREDIT)****PANEL A: COMPLETE SAMPLE (N = 136,945)**

| <b>CREDIT LIMIT</b>                         | <b>&lt;300</b> | <b>300-400</b> | <b>400-500</b> | <b>500-600</b> | <b>600-700</b> | <b>700+</b> | <b>Full Sample</b> |
|---|----------------|----------------|----------------|----------------|----------------|-------------|--------------------|
| Credit Limit in 2003 (\$ thousands)         | 1.873          | 5.903          | 9.594          | 23.18          | 35.49          | 39.30       | 31.42              |
| Credit Limit in 2004 (\$ thousands)         | 1.176          | 3.996          | 8.990          | 24.81          | 42.70          | 45.77       | 36.24              |
| Credit Change 2004-03 (\$ thousands)        | -0.697         | -1.906         | -0.604         | 1.627          | 7.213          | 6.470       | 4.825              |
| Increase in Credit Limit 2003-04 (% cohort) | 16.01          | 23.22          | 37.3           | 53.34          | 64.21          | 55.04       | 52.37              |
| Positive Credit Limit 2004 (% cohort)       | 41.53          | 66.13          | 80.42          | 92.19          | 96.15          | 97.71       | 91.76              |
|   | n = 5358       | n = 7583       | n = 7365       | n = 18863      | n = 26967      | n = 70809   | n = 136945         |

**PANEL B: NON-BANKRUPT INDIVIDUALS (N = 135,122)**

|   |          |          |          |           |           |           |            |
|---|----------|----------|----------|-----------|-----------|-----------|------------|
| Credit Limit in 2003 (\$ thousands)         | 1.765    | 5.659    | 9.467    | 22.91     | 35.43     | 39.29     | 31.57      |
| Credit Limit in 2004 (\$ thousands)         | 1.171    | 4.091    | 9.167    | 25.29     | 42.94     | 45.79     | 36.67      |
| Credit Change 2004-03 (\$ thousands)        | -0.594   | -1.568   | -0.300   | 2.379     | 7.514     | 6.496     | 5.094      |
| Increase in Credit Limit 2003-04 (% cohort) | 16.38    | 24.19    | 38.2     | 54.63     | 64.65     | 55.07     | 52.98      |
| Positive Credit Limit 2004 (% cohort)       | 41.29    | 66.55    | 80.95    | 92.50     | 96.22     | 97.72     | 92.12      |
|   | n = 4950 | n = 7118 | n = 7140 | n = 18383 | n = 26770 | n = 70761 | n = 135122 |

**PANEL C: BANKRUPT INDIVIDUALS (N = 1,823)**

|   |         |         |         |         |         |        |          |
|---|---------|---------|---------|---------|---------|--------|----------|
| Credit Limit in 2003 (\$ thousands)         | 3.182   | 9.633   | 13.63   | 33.47   | 43.62   | 49.00  | 19.67    |
| Credit Limit in 2004 (\$ thousands)         | 1.239   | 2.551   | 3.385   | 6.287   | 9.948   | 17.836 | 4.546    |
| Credit Change 2004-03 (\$ thousands)        | -1.943  | -7.082  | -10.25  | -27.18  | -33.67  | -31.17 | -15.12   |
| Increase in Credit Limit 2003-04 (% cohort) | 11.52   | 8.39    | 8.00    | 3.75    | 4.06    | 10.42  | 7.41     |
| Positive Credit Limit 2004 (% cohort)       | 44.36   | 59.78   | 63.56   | 80.42   | 86.29   | 85.42  | 65.77    |
|   | n = 408 | n = 465 | n = 225 | n = 480 | n = 197 | n = 48 | n = 1823 |

Notes: The numbers reported are the mean of the credit variable indicated in the row header for a particular to the credit score in 2003. Panel A reports the statistics for the complete sample, Panel B reports the statistics for individuals who have never declared bankruptcy, and Panel C reports the statistics for individuals who did declare bankruptcy between 2003 and 2004.

**TABLE 3: REGRESSION RESULTS (NON-BANKRUPT INDIVIDUALS)**

| Dependent Variable                            | Total Credit Limit<br>(2004) | Installment Credit Limit<br>(2004) | Mortgage Limit<br>(2004)    | Revolving Credit Limit<br>(2004) |
|---|------------------------------|------------------------------------|-----------------------------|----------------------------------|
| Total Credit Limit                            | 0.820***<br>(0.0057)         | 0.0230***<br>(0.0012)              | 0.759***<br>(0.0050)        | 0.0384***<br>(0.0021)            |
| Revolving Credit Limit                        | 0.323***<br>(0.015)          | -0.0140***<br>(0.0031)             | -0.567***<br>(0.013)        | 0.904***<br>(0.0057)             |
| Number of Currently Active Bank Cards         | 0.681***<br>(0.17)           | 0.608***<br>(0.044)                | -0.347**<br>(0.15)          | 0.419***<br>(0.065)              |
| Percentage Black                              | 2.480<br>(3.09)              | -3.566***<br>(0.96)                | 1.988<br>(2.78)             | 4.058***<br>(0.85)               |
| Credit Score                                  | 0.0523***<br>(0.0019)        | -0.00192***<br>(0.00051)           | 0.0305***<br>(0.0017)       | 0.0237***<br>(0.00058)           |
| Installment Credit Limit                      | 0.255***<br>(0.017)          | 0.660***<br>(0.0061)               | -0.405***<br>(0.015)        | 0.000120<br>(0.0051)             |
| Age   | 0.338***<br>(0.062)          | -0.244***<br>(0.015)               | 0.331***<br>(0.054)         | 0.252***<br>(0.020)              |
| Age-Squared                                   | -0.0106***<br>(0.00057)      | 0.00118***<br>(0.00013)            | -0.00841***<br>(0.00049)    | -0.00339***<br>(0.00019)         |
| Equivalent of High School (Male)              | -6.390<br>(5.42)             | 1.290<br>(1.71)                    | -8.523*<br>(4.70)           | 0.843<br>(1.85)                  |
| Equivalent of High School (Female)            | 4.691<br>(6.11)              | 0.620<br>(1.79)                    | 3.302<br>(5.39)             | 0.769<br>(2.02)                  |
| Greater Than High School Equivalency (Male)   | -3.424<br>(4.86)             | -1.521<br>(1.41)                   | -2.769<br>(4.24)            | 0.866<br>(1.71)                  |
| Greater Than High School Equivalency (Female) | 1.247<br>(5.58)              | 3.592**<br>(1.57)                  | -3.748<br>(4.87)            | 1.403<br>(1.97)                  |
| Non-married (Male)                            | -2.812<br>(5.75)             | -0.828<br>(1.41)                   | -5.696<br>(5.02)            | 3.712*<br>(2.01)                 |
| Non-married (Female)                          | 1.625<br>(6.28)              | 0.355<br>(1.56)                    | 4.345<br>(5.56)             | -3.075<br>(2.07)                 |
| Percentage Foreign Born                       | 7.333*<br>(3.88)             | -2.611***<br>(0.80)                | 6.394*<br>(3.42)            | 3.549***<br>(1.20)               |
| Percentage with Positive Earnings             | 3.011<br>(5.22)              | 2.718**<br>(1.36)                  | -3.013<br>(4.51)            | 3.306<br>(2.07)                  |
| Percentage Owner Occupied Homes               | -3.867<br>(2.67)             | 1.047*<br>(0.61)                   | -6.943***<br>(2.37)         | 2.029**<br>(0.85)                |
| Percentage Homes with Mortgages               | 9.103***<br>(2.83)           | -1.465**<br>(0.71)                 | 11.76***<br>(2.48)          | -1.188<br>(0.93)                 |
| Median Gross Rent                             | 0.00475**<br>(0.0019)        | 0.000266<br>(0.00042)              | 0.00370**<br>(0.0016)       | 0.000785<br>(0.00063)            |
| House Value                                   | 0.0000512***<br>(0.000010)   | -0.00000261**<br>(0.0000013)       | 0.0000500***<br>(0.0000095) | 0.00000377<br>(0.0000028)        |
| Widowed (Male)                                | 6.381<br>(16.5)              | -7.867*<br>(4.58)                  | 4.179<br>(14.2)             | 10.07<br>(6.39)                  |
| Widowed (Female)                              | 9.652<br>(7.93)              | 0.335<br>(2.23)                    | 8.613<br>(6.85)             | 0.704<br>(2.86)                  |
| Divorced (Male)                               | 5.603<br>(9.17)              | 1.936<br>(2.70)                    | 5.800<br>(7.94)             | -2.133<br>(3.13)                 |
| Divorced (Female)                             | 40.21***<br>(8.30)           | -2.563<br>(2.34)                   | 38.63***<br>(7.29)          | 4.147<br>(2.73)                  |
| Percentage Public Assistance                  | -27.14**<br>(11.6)           | -4.410<br>(3.22)                   | -26.06***<br>(9.95)         | 3.324<br>(4.35)                  |
| Constant                                      | -37399<br>(49688)            | -7964<br>(11154)                   | -16435<br>(43613)           | -13000<br>(17612)                |
| Observations                                  | 135122                       | 135122                             | 135122                      | 135122                           |
| R-squared                                     | 0.53                         | 0.38                               | 0.41                        | 0.58                             |

Notes: The numbers reported are the selected coefficients estimated using a standard OLS model. Robust standard errors are reported in parentheses, and we adopt the usual convention: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**TABLE 4: BANKRUPTCY PENALTY (REVOLVING CREDIT)**

| <b>Credit Score in 2003</b> | <b>Bankruptcy Penalty<br/>(\$ thousands)</b> | <b>Positive Penalty<br/>(% of cohort)</b> | <b>Bankruptcy<br/>Penalty<br/>(% of 2003 credit<br/>limit)</b> |
|-----------------------------|--|---|--|
| <300                        | 0.303  | 65.0                                      | 173  |
| 300-400                     | (6.83)                                       | 26.0                                      | (18.5)   |
| 400-500                     | (12.3)                                       | 12.9                                      | (133)  |
| 500-600                     | (31.2)                                       | 2.29                                      | (126)  |
| 600-700                     | (38.5)                                       | 3.05                                      | (101)  |
| 700+                        | (38.4)                                       | 4.17                                      | (110)  |
| Full Sample                 | (16.6)                                       | 23.8                                      | (45.0)   |

Notes: The values reported pertain to individuals who declared bankruptcy between 2003 and 2004. The first column reports the average difference between forecast revolving credit, as described in the text, and actual revolving credit in thousands of dollars (the bankruptcy penalty), the second column reports the the percentage of individuals who had an increase in counter-factual credit (positive penalty), and the third column reports the bankruptcy penalty divided by revolving credit limit in the year before bankruptcy. Each statistic is reported for the credit score group denoted in the row heading.

**TABLE 5: CREDIT CHANGES - POSITIVE VS NEGATIVE PENALTIES**

|  | MEAN             |                  |            | MEDIAN           |                  |            |
|--|------------------|------------------|------------|------------------|------------------|------------|
|  | Negative Penalty | Positive Penalty | Difference | Negative Penalty | Positive Penalty | Difference |
| Credit Score (2003)                              | 479              | 323              | (156)***   | 504              | 290              | (215)***   |
| Credit Score (2004)                              | 346              | 331              | (15.3)***  | 339              | 304              | (34.7)***  |
| Revolving Credit Limit (2003) (\$ thousand:25.0) |                  | 2.57             | (22.4)***  | 15.0             | 0.50             | (14.5)***  |
| Revolving Credit Limit (2004) (\$ thousand:4.99) |                  | 3.12             | (1.87)***  | 1.00             | 0.00             | (1.00)***  |
| Total Credit Limit (2003) (\$ thousands)         | 98.0             | 30.4             | (67.6)***  | 76.7             | 18.9             | (57.8)***  |
| Total Credit Limit (2004) (\$ thousands)         | 50.3             | 22.4             | (27.9)***  | 22.5             | 9.54             | (12.9)***  |
| Revolving Credit Utilization (2003)              | 67.4             | 67.4             | (0.01)     | 72.0             | 70.1             | (1.90)     |
| Revolving Credit Utilization (2004)              | 34.8             | 45.3             | 10.5***    | 15.2             | 36.0             | 20.9***    |
| Total Credit Utilization (2003)                  | 69.5             | 73.0             | 3.52***    | 72.7             | 76.8             | 4.15*      |
| Total Credit Utilization (2004)                  | 53.8             | 65.8             | (5.08)***  | 60.1             | 76.7             | (6.10)***  |
|  | n = 1389         | n = 434          |            | n = 1389         | n = 434          |            |

Notes: The values reported pertain to individuals who declared bankruptcy between 2003 and 2004. The sample is partitioned into two groups: positive penalty and negative penalty. The statistics reported are the mean and median values for each of the credit measures in the row heading. We adopt the usual convention: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 to indicate if the difference between the positive penalty statistic and the negative penalty statistic is meaningful.



**TABLE 6: DISTRIBUTION OF INDIVIDUAL CHARACTERISTICS - POSITIVE VS NEGATIVE PENALTIES**

|  | MEAN             |                  |            | MEDIAN           |                  |            |
|--|------------------|------------------|------------|------------------|------------------|------------|
|  | Negative Penalty | Positive Penalty | Difference | Negative Penalty | Positive Penalty | Difference |
| Black (% in 1 mile radius)                               | 13.9             | 18.7             | (4.81)***  | 3.66             | 4.95             | (1.29)***  |
| Foreign Born (% in 1 mile radius)                        | 9.55             | 7.55             | (2.01)***  | 5.22             | 3.54             | 1.68***    |
| Equivalent of High School (% males in 1 mile radius)     | 29.1             | 30.8             | (1.75)***  | 29.0             | 31.0             | (1.99)***  |
| Equivalent of High School (% females in 1 mile radius)   | 30.8             | 32.1             | (1.26)***  | 30.7             | 32.3             | (1.61)***  |
| Greater Than High School Equivalency (% males in 1 mile) | 51.1             | 46.6             | 4.53***    | 49.9             | 44.7             | 5.17***    |
| Greater Than High School Equivalency (% females in 1 mi) | 49.7             | 46.0             | 3.70***    | 48.4             | 44.2             | 4.24***    |
| Non-married (% males in 1 mile radius)                   | 30.0             | 30.1             | (0.11)     | 28.8             | 29.4             | (0.63)     |
| Non-married (% females in 1 mile radius)                 | 23.9             | 24.1             | (0.19)     | 22.2             | 22.0             | 0.19***    |
| Widowed (% males in 1 mile radius)                       | 2.56             | 2.90             | (0.34)     | 2.40             | 2.57             | (0.18)     |
| Widowed (% females in 1 mile radius)                     | 10.4             | 11.5             | (1.07)     | 10.0             | 11.4             | (1.33)     |
| Divorced (% males in 1 mile radius)                      | 9.44             | 10.1             | (0.61)***  | 9.20             | 9.89             | (0.70)***  |
| Divorced (% females in 1 mile radius)                    | 11.7             | 12.3             | (0.65)***  | 11.7             | 12.3             | (0.68)***  |
| Owner Occupied Homes (% in 1 mile radius)                | 67.0             | 65.4             | 1.65***    | 69.2             | 67.0             | (2.21)*    |
| Homes with Mortgages (% in 1 mile radius)                | 71.1             | 67.7             | 3.45***    | 71.8             | 67.8             | (4.06)***  |
| Median Gross Rent  | 638              | 574              | 63.6***    | 597              | 537              | 59.6***    |
| House Value (\$ thousands)                               | 117              | 94.6             | 0.02***    | 100              | 83.1             | 0.02***    |
| Vacant Homes (% in 1 mile radius)                        | 6.82             | 8.08             | (1.26)***  | 5.43             | 6.73             | (1.30)***  |
| Positive Earnings (% in 1 mile radius)                   | 81.3             | 78.7             | 2.58***    | 81.9             | 78.8             | (3.10)***  |
| Public Assistance (% in 1 mile radius)                   | 3.54             | 4.27             | (0.73)***  | 2.52             | 3.15             | (0.63)     |
|  | n = 1389         | n = 434          |            | n = 1389         | n = 434          |            |

Notes: The values reported pertain to individuals who declared bankruptcy between 2003 and 2004. The sample is partitioned into two groups: positive penalty and negative penalty. The statistics reported are the mean and median values for each of the demographic measures in the row heading. We adopt the usual convention: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 to indicate if the difference between the positive penalty statistic and the negative penalty statistic is meaningful.

**TABLE 7: BANKRUPTCY PENALTY: 2003-2004 VS. 2006-2007 (REVOLVING CREDIT)**

| Credit Score in 2003 | 2003-2004                    |                            | 2006-2007                    |                            | CHANGE FROM 2003             |                            |
|----------------------|------------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
|                      | Average Credit Limit in 2003 | Average Bankruptcy Penalty | Average Credit Limit in 2006 | Average Bankruptcy Penalty | Average Credit Limit in 2006 | Average Bankruptcy Penalty |
| <300                 | 1.873                        | 0.303                      | 5.966                        | (7.609)                    | 218%                         | -2608%                     |
| 300-400              | 5.903                        | (6.834)                    | 7.539                        | (9.564)                    | 28%                          | 40%                        |
| 400-500              | 9.594                        | (12.27)                    | 12.064                       | (16.00)                    | 26%                          | 30%                        |
| 500-600              | 23.18                        | (31.24)                    | 22.10                        | (28.58)                    | -5%                          | -9%                        |
| 600-700              | 35.49                        | (38.50)                    | 40.45                        | (39.19)                    | 14%                          | 2%                         |
| 700+                 | 39.30                        | (38.44)                    | 46.37                        | (34.23)                    | 18%                          | -11%                       |
| Full Sample          | 31.42                        | (16.59)                    | 39.02                        | (22.98)                    | 24%                          | 39%                        |
|                      | n = 136945                   | n = 1823                   | n = 936226                   | n = 5343                   |                              |                            |

Notes: The values reported pertain to individuals who declared bankruptcy between 2003 and 2004 and separately for those who declare bankruptcy between 2006 and 2007. For each group the average revolving credit limit and bankruptcy penalty, as defined in the text, is reported.