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*The Reacquisition of Credit  
Following Chapter 7 Personal  
Bankruptcy*

by  
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**The Reacquisition of Credit Following  
Chapter 7 Personal Bankruptcy\***

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ABSTRACT  
of

The Reacquisition of Credit following Chapter 7 Personal Bankruptcy

Federal law allows credit bureaus to report past bankruptcies up to ten years, so the financial implication of filing includes a ten-year influence on new credit. I document this influence with a large panel database of credit files which tracks many Chapter 7 filers *past* the moment when the filing disappears from potential creditors' view, providing a tightly controlled test of the filing's impact on credit access. The principal finding is that the bankruptcy flag has a big effect on the access of the more creditworthy past filers; when they lose their bankruptcy flags, their credit scores jump substantially and they open new credit relationships, high-limit bank cards in particular, quickly. Subsequently, the score-increases mostly reverse and delinquency is abnormally high.

Consumers access credit markets in the context of their credit files, which are moving windows onto the past experience of their creditors. The windows move because Federal law mandates the life span of derogatory items by limiting how long credit bureaus can report them. For most items the limit is seven years, but bankruptcy filings can remain on credit files for ten years. So for a consumer contemplating bankruptcy, the cost/benefit analysis of filing includes not only the one-time offset of some assets against some debts, but also the ten-year influence of a past filing on new credit access. This paper maps out the bankruptcy-related financial constraint by tracking the credit files of a large panel of consumers who filed Chapter 7 bankruptcy in the previous ten years, and another large panel who did not. The goals are to help complete the strategic picture of the filing decision, and also to describe the financial environment of a large number of consumers.

Personal Chapter 7 filings, consistently around 70% of all personal filings, run about a million per year. As Figure 1 illustrates,<sup>1</sup> there were two large run-ups in the filing rate – tripling from 1984 to 1991, and doubling from 1994 to 1997 – which have delivered an unprecedented 6.7 million Americans within ten years of a past filing. The rate’s increase has provoked academic and political interest in the filing decision, especially as it relates to the legislative intent of Chapter 7 to provide a fresh start to honest debtors, and the political interest in particular is on the potential for abuse by those able but unwilling to repay.<sup>2</sup> Their putative disincentives include some amount of ostracism, usually called ‘stigma,’ and reduced access to consumption-smoothing by way of the financing constraint.

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<sup>1</sup> Tables and figures are at the end.

The database for this study allows an unusually precise measurement of credit access after bankruptcy. For about 1% of all the Americans who filed Chapter 7 between November 1984 (11/1984) and 7/1994, as well as a control sample who did not file then, there are credit files and credit scores as of nine dates: quarterly from 7/1994 to 4/1996, and also 9/1997. The data cover many varieties of consumer credit, but the analysis focuses on bank cards, for two reasons. First, bank-card debt is generally unsecured, and is the major part of unsecured consumer debt, so it is the major market affected by creditworthiness issues. And second, the industry's intense solicitation provides a fast link between potential and actual bank-card access. If a consumer's credit file changes in a way that frees up bank-card credit that he wants, then he will soon have it and the credit file will show it. This compares to credit relationships such as car loans, which reflect credit-file changes only when the consumer actively shops for them.

The database tracks each consumer for just 38 months (i.e. 7/1994 to 9/1997) but a combination of cross-sectional and time-series techniques extracts from it much more of the post-petition experience. For any  $n$  from 2 to 11, there is a large number of panelists who begin their  $n^{\text{th}}$  post-petition year near one of the dates, and end it near another, so measuring credit acquisition over the  $n^{\text{th}}$  year involves just tracking a measure of their credit access from one date to the other. The most useful feature of the database is that it tracks the credit files of several thousand consumers *past* the moment in the 10<sup>th</sup> year when the filing disappears from potential creditors' view, providing a tightly-controlled test of the filing's impact on credit access. To provide a sense of the relative

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<sup>2</sup> For example, see "House Approves Bankruptcy Overhaul Amid Criticism Bill May Be Too Tough" in the May 6, 1999 *Wall Street Journal*.

impact on consumers in different circumstances, the results of this test are sorted by initial credit score.

The principal finding is a big 10<sup>th</sup>-year effect for the better credits. Those going into the year with relatively high credit scores initiate new credit relationships, high-limit bank cards in particular, at a pace far above normal after credit bureaus take down their bankruptcy flags. This is unambiguous evidence of an economically significant credit constraint imposed by a filing ten years after it occurred, with the implication that filers suddenly appear much more creditworthy when their bankruptcy flags go down. If creditors make efficient use of bankruptcy flags, this in turn implies that the filers suddenly appear more creditworthy than they really are, or in other words that they are less creditworthy than non-filers with the same credit scores. Data on filers' future delinquency supports this view.

The rest of the paper is in five sections. Section I summarizes the relevant legislation and situates the study in the bankruptcy literature, Section II describes the database, Section III measures the reacquisition of credit, Section IV examines delinquency after the tenth year, and Section V summarizes and concludes.

## **I. Legislation and Literature**

### *I.A Relevant Legislation*

Chapter 7 discharges existing debts, except those that can not be discharged (e.g. student loans) and those that consumers reaffirm (e.g. car loans, so they can keep the cars). The discharge permanently enjoins the affected creditors from trying in any way to collect. In exchange, the consumer forfeits his assets that exceed statutory exemptions.

The alternative procedure is Chapter 13, where there is no forfeit or immediate discharge, but instead a partial repayment on a 3-5 year schedule followed (if completed) by a discharge of the remainder.<sup>3</sup> The virtue of studying life after Chapter 7, rather than Chapter 13 or some other delinquency event, is that the immediate discharge clarifies the relation between the event and future credit. The affected debt is no longer outstanding, so Chapter 7's lingering influence on potential creditors reflects the simple fact that it occurred, and not an overhanging claim.

Potential creditors pay credit bureaus to read the credit files they compile. Both the content and distribution of the files are restricted by the Fair Credit Reporting Act (FCRA), which draws an important distinction between transactions initiated by the consumer and those initiated by the creditor. If the consumer initiates, the creditor is generally free to purchase and review the consumer's file in deciding on the request. If the creditor initiates and the consumer does not authorize the report's release, then the creditor can get the report only if "the transaction consists of a firm offer of credit or insurance" (FCRA §604c). The best-known examples of the creditor-initiated scenario are the three billion per year<sup>4</sup> pre-approved bank-card solicitations.

A wide range of derogatory facts can land on credit files, but they can't remain forever. Most facts, such as suits and judgments, paid tax liens, charged-off accounts, arrests and convictions, must be gone after seven years, but bankruptcies of any chapter can remain for ten. This implies two important dates for a post-bankruptcy consumer: seven years post-petition, when derogatory information about his pre-petition debt

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<sup>3</sup> For a detailed description of the different bankruptcy options, see *Bankruptcy Basics*, available at [www.uscourts.gov/publications.html](http://www.uscourts.gov/publications.html).

<sup>4</sup> "Banks Expand Card Marketing and Credit Extension While Seeking to Restrict Consumer Access to Bankruptcy," Consumer Federation of America, July 8, 1998 press release.



disappears from creditors' view, and ten years post-petition, when the filing itself disappears. The source of this paper's database, the credit bureau Experian, removes the items *not* exactly at 7 and 10 years, but rather in the last six months of the 7<sup>th</sup> and 10<sup>th</sup> years, respectively. To be safe, the tests below assume only that the items are on the files at the beginning and off the files at the end of the 7<sup>th</sup> and 10<sup>th</sup> years.

### *I.B Literature on Personal Bankruptcy*

The bankruptcy code balances the benefit of insuring against expensive household misfortunes with the cost of facilitating creditor-abuse by opportunists. It clearly delivers some amount of insurance. Domowitz and Sartain (1999) show large medical debt to be a major contributor to the decision to file, and Sullivan, Warren and Westbrook (1989), Sullivan (1968) and Stanley and Girth (1971) all find substantial medical debt owed by bankrupts. The amount of abuse is more difficult to pin down. Several studies estimate bankrupts' repayment capacity, but reach disparate conclusions (see, e.g., Barron and Staten (1997) and Culhane and White (1999)). The cost of abuse is not necessarily just the wealth transfer from creditors to debtors; it can include reduced credit access for lower-wealth households. Gropp, Scholz and White (1997) shows that lower-wealth households have less debt and pay higher rates in high-exemption states (e.g. Florida, with its unlimited homestead exemption), and argues that the option to keep more value in bankruptcy is to blame.

The filing rate's increase is consistent with a change in the filing decision. That is, the growth in filings may reflect growth in the set of financial circumstances that induce filing. This view is supported by Gross and Souleles (1998), which shows credit-

card holders 1% more likely to file bankruptcy in 1997 than 1995, controlling for household risk-composition along several dimensions. Their interpretation is that filing is discouraged by stigma, and stigma has decreased. Another view, not mutually exclusive, is that the number of households in circumstances that have consistently induced filing has increased. Sullivan, Warren and Westbrook (1994) compares samples of filers from 1981 and 1991, and finds their reported financial conditions very similar. A related argument is in Ausubel (1997) and Ellis (1998), which argue that household debt has grown because bank-card issuers allow and encourage more borrowing among marginal credits than they did previously (e.g. Black and Morgan (1999)), increasing the density of households that benefit from filing.

Staten (1993) proposes that some of the connection between filings and sub-prime consumer lending runs in the other direction. Recent filers would intuitively be marginal credits, so the increase in sub-prime lending suggests more credit after bankruptcy which means a greater incentive to file. Looking at the May 1988 credit files of 2000 who filed between 1978 and 1988, that study finds a significant fraction of filers with at least one new credit relationship - 16% within one year, and 53% within five years – and argues that consumer creditors may suffer a coordination problem. All creditors presumably want consumers to expect little credit after Chapter 7, since their historical recovery rate in Chapter 7 is so low,<sup>5</sup> but they may also view recent filers with no other debt as attractive customers, and hence grant them credit. The six-year moratorium on repeat discharges may exacerbate the problem by making recent filers even *more* attractive.

These studies demonstrate the need for a rigorous examination of financial life after bankruptcy, a task for which this paper's database is uniquely well-suited. In

September 1997, the credit bureau Experian drew a random sample of consumers, and tracked them back through archived credit files to July 1994. The sample includes 44,060 who had Chapter 7 bankruptcy flags on their 7/1994 files, the earliest filings from 11/1984 (n.b. 116 months before), and the latest from 7/1994. There are also 19,997 who were not, as of 7/1994, identified as past filers. So there is a time series of credit-related data on a large sample of past filers at different points in their post-bankruptcy lives, and also a large control sample to compare with.

The time-series data address a potential identification problem. Suppose there were just cross-sectional data on past filers, for example just the 7/1994 credit files of those who filed between 11/1984 and 7/1994. We could estimate the acquisition of credit over the ninth year after bankruptcy from the difference between the 7/1994 files of 7/1986 and 7/1985 filers. One big problem, among others, is that in addition to the ninth-year effect we will pick up the change in the filing population from 7/1985 to 7/1986. If the distribution of 1986 filers' repayment capacities were different from that of 1985 filers, then their future credit files would intuitively differ as well. The time series address this problem by showing the beginning *and* end of the ninth year for a fixed set of consumers.

Another virtue of these time series is that they track several thousand consumers into the period *after* their bankruptcy flags go down. Experian stopped reporting the flags to creditors, but the research database saved the filing date so it shows past filings that creditors can not see, out to 12 years 10 months (i.e. 11/1984 to 9/1997) after bankruptcy. This is the major opportunity of the study, to infer the constraining effect of a bankruptcy flag by measuring what happens to credit when it disappears. We can

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<sup>5</sup> About one cent on the dollar (White (1987), Sullivan, Warren and Westbrook (1989)).

observe the credit constraint due to the flag itself, and not to the misfortune that precipitated bankruptcy – divorce, health problem, unemployment, etc. – that is resolving over the same period, and would presumably have affected credit access even if bankruptcy had not been filed.

If the bankruptcy flag imposes a binding credit constraint, then credit will expand after the flag goes down but only as fast as the consumers and their newly-willing creditors find each other. For some types of credit relationship, this search might be haphazard and slow, taking longer than the database covers. For example, a consumer might not know he can get a Macy's card until he shops there, and asks. But for bank cards, searching is apparently not an issue. Pre-approved bank-card solicitations arrive every twelve days<sup>6</sup> or so at the average household, suggesting that the discovery of new bank-card access is cheap and quick. This is one reason why the tests below focus on the aggregate bank-card statistics.

The other reason is that bank-card debt is such a large element of household finance. At year-end 1997, Visa and MasterCard receivables amounted to \$398 billion,<sup>7</sup> which is \$4000 per household and three-quarters of the \$531 billion total revolving consumer debt reported by the Federal Reserve.<sup>8</sup> And bank-card debt is generally not secured, though the exact fraction that *is* secured has not been reported, so the issuers are heavily exposed to the card-holders' credit risk. Together, these characteristics of bank cards make them the natural testing-ground for the practical effect of the bankruptcy flag:

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<sup>6</sup> 3 billion solicitations/year, 365 days/year, 100 million households.

<sup>7</sup> *1999 Card Industry Directory*. There was also \$36 billion of Discover card and \$14.6 billion of Amex card debt.

<sup>8</sup> Federal Reserve Statistical Release G.19.

they are a big source of credit, they are credit-risk sensitive, and they quickly bring their availability to consumers' attention.

The next section describes the database, and the following section performs the tests that describe the evolution of credit access after Chapter 7: first credit scores, then all credit, then finally bank cards in particular.

## **II. Data**

The consumers with Chapter 7 bankruptcy flags as of 7/1994 are the “filers”, and those without are the “non-filers.” The database provides the filing month of each filer, and the distribution of filers across months is plotted in Figure 2. The variation across months in Figure 2 is somewhat but not entirely due to variation in the national filing rate. This is apparent in Figure 3, which is essentially Figure 2 divided by Figure 1: for each month, the number in Figure 2 is divided by 1/3 of that month's quarter's number in Figure 2. The number of the panel's filers for a given month is generally around 1% of all filers, except at the very beginning and the very end, when it is much lower. The low numbers in 1994 probably reflect lags in reporting filings to bureaus, and the low 1984/5 numbers reflect some combination of incomplete reporting of filings in those years, randomness of the flag-removal date engendered by Experian's purging method,<sup>9</sup> mortality (they had to survive to 9/1997 to make the database), and potentially some unknown factors.

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<sup>9</sup> Starting at 114 months post-petition, flags are removed the next time the purging software processes the file. The purging software processes each file at least once every six months, but the exact moment in post-petition time is not fixed. Similarly, other derogatory information is purged starting at 6½ years=78 months.

For each panelist, the database provides the current credit score and a credit file every three months from 7/1994 to 4/1996, and also 9/1997. Each credit file is 354 variables describing the consumer's interaction with credit markets – current usage, current and past delinquency, number of active relationships (called “open trades”), and so on. Credit scores are FICO scores calculated from credit-file facts with a proprietary algorithm developed by Fair, Isaac, whose literature says that a credit score “sums up, at a given point in time, what your past credit performance and current usage says about your future credit performance.”<sup>10</sup>

The Fair, Isaac literature does not offer a direct interpretation of the scores, except that higher is better. To create scores that *do* have an interpretation, FICO scores are converted to FICO percentiles. On each date, the empirical distribution of the non-filers' FICO scores is calculated, and the filers' scores are mapped to their percentiles in this distribution. If a filer's score is higher than  $n\%$  of contemporaneous non-filer scores, his FICO percentile is  $n$ . In this exercise, missing FICO scores are removed. In both the filer and non-filer panels, about 10% of FICO scores are reported as missing, and the missing value code almost always indicates that the FICO algorithm requires more information from the past six months than the credit file reports. The tests below refer only to FICO percentiles, and not to the scores themselves.

### **III. Annual Changes in Credit Access**

The database contains four pairs of observation dates separated by a year: 7/1994 and 7/1995, 10/1994 and 10/1995, 1/1995 and 1/1996, and 4/1995 and 4/1996. Each filer begins his  $n^{\text{th}}$  year after bankruptcy within one month of the initial date of one of these

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<sup>10</sup> From “Consumer FAQs,” at [www.fairisaac.com/FI\\_Home/html/consumers.html](http://www.fairisaac.com/FI_Home/html/consumers.html).

pairs, for exactly one  $n$ . For example, those who filed in 6/1988 through 8/1988 were within one month of beginning their 7<sup>th</sup> years after bankruptcy in 7/1994, and finishing in them in 7/1995, and were *not* within one month of beginning any *other* year in 10/1994, 1/1995 or 4/1995. So for each filer, we get one example of the change in credit access over (approximately) the  $n^{\text{th}}$  year for one  $n$ . Given the range of filing months and data months, there are some filers for each  $n$  from 1 through 11, but the population for  $n=1$  (i.e. 6/1994 and 7/1994 filers) is small and potentially biased, so we will look only at  $n=2$  through 11.

The first measure of credit access to consider is the credit score, both because it putatively summarizes the credit file's information about creditworthiness, and also because consumer creditors often refer to the score in lieu of the entire file. The goal is to characterize the  $n^{\text{th}}$ -year score change. To allow for the possibility that different scores change differently, for example that the change over the 7<sup>th</sup> year is different for scores that start out low rather than high, the panel is sorted two ways. Filers are sorted by  $n$ , and also by initial FICO percentile into five bins: [0,10), [10,20), [20,30), [30,40), and [40,50). Very few past filers have FICO percentiles above 50, so they are tossed out. Results are plotted in Figure 4, where each  $n$  is a different line, initial FICO percentiles increase from left to right, and  $n^{\text{th}}$ -year FICO percentile change is on the  $y$ -axis. Means and their standard errors are also reported as Table I.

The graph makes several points. First, scores are mean-reverting; low FICOs increase, and higher ones decrease. As we will establish rigorously in Section IV, this is true for all consumers, not just past filers. Second, the 7<sup>th</sup> year, when derogatory information about pre-petition debt disappears, has a different effect on different scores.

Lower scores increase much more, relative to other years, than do higher scores. And finally, the 10<sup>th</sup> year, when the flag goes down, has a big effect on the better scores. Percentiles in the [40,50) range increase an average of 18, so for example from 45<sup>th</sup> percentile among non-filers to 63<sup>rd</sup> percentile. The effect is smaller for the middle ranges, and essentially zero for the bottom. The standard errors show that the relevant pairwise differences are statistically significant.<sup>11</sup>

The dynamics of the 7<sup>th</sup> and 10<sup>th</sup>-year effects make intuitive sense. After the 7<sup>th</sup> year, the credit file still shows the filing, just not its particulars. This is good news for those whose particulars were relatively bad, and bad news for those whose particulars were relatively good. The cross section of the 10<sup>th</sup>-year effect matches the intuitive news value of a past filing; if a consumer's credit file shows high risk, a past filing is no surprise, but if it shows low risk, it is a big surprise. A past bankruptcy makes a good file much worse, but has little effect on one that's already bad.

Do the credit-score developments represent changes in apparent creditworthiness that deliver meaningful new credit access? The credit files show the  $n^{\text{th}}$ -year change in various measures of credit access. The rest of the section uses the methodology from Table I to detect the cross section and time series of credit access in these measures. The one change from Table I is that initial FICO percentiles are sorted into four groups: [0,16.67), [16.67,33.33), [33.33,50) – “low-FICO,” “medium-FICO” and “high-FICO” - and missing, or “no-FICO”. The FICO bins are reduced from five to three to reduce clutter in the graphs, and the no-FICO bin is included to address any concerns that

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<sup>11</sup> With the usual distributional assumptions, the difference between two means is statistically significant if two standard errors from one is not within two standard errors of the other. In this case, the 7<sup>th</sup>-year means of the middle three FICO partitions and the 10<sup>th</sup>-year changes of the top three FICO partitions are more than



focusing on consumers who initially have FICOs somehow biases the tests. Going into their 10<sup>th</sup> years, 28.1% of filers are low-FICO, 34.4% are medium-FICO, 23.3% are high-FICO, 12.7% are no-FICO, and 1.5% have FICO percentiles above 50.<sup>12</sup>

Perhaps the broadest measure of credit access in the credit files is “Total number of open trades,” the number of active relationships the consumer has with creditors that report to the bureau. Figure 5 plots the  $n^{\text{th}}$ -year changes of this variable, and Panel A of Table II shows the point estimates and standard errors.

By this gauge, credit acquisition is much faster in the 10<sup>th</sup> year, as well as the 11<sup>th</sup>, for the high and medium FICO groups. Growth in active credit relationships expands steadily from the early post-petition years to the 9<sup>th</sup> year, and then more rapidly with point estimates about ½ new account per year higher. Standard errors show this increase to be statistically significant, but the subsequent increase from the 10<sup>th</sup> to 11<sup>th</sup> years is not statistically significant. For the low-FICO group, the 10<sup>th</sup> year does not bring any statistically or economically significant new credit access. There is also a significant increase from the 6<sup>th</sup> to the 7<sup>th</sup> year, but again, only for the medium- and high-FICO groups.

These results indicate more financial constraint with the bankruptcy flag than without, but such a broad measure of credit access can not characterize the constraint very usefully. Access to unsecured borrowing is addressed more directly by “Total number of open bank cards.” The  $n^{\text{th}}$ -year evolution of this variable is summarized in Panel B of Table II and Figure 6.

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two standard errors higher than two standard errors above the same-FICO means from years 2-6, and 8-9 in all but one instance.

<sup>12</sup> In July 1997, the corresponding FICO cutoffs for the low, medium and high bins were [0,585], [586,658] and [659,714].

The results show that about half of the post-flag increase in open trades is new bank cards. The high-FICO and medium-FICO types acquire an average of 0.78 and 0.63 new bank cards, respectively, in their 10<sup>th</sup> years, around half the average of 1.34 and 1.46 new accounts (from Panel A), respectively, they acquire then. This implies, as predicted, a fast response of acquisition to availability. The flag goes down at 114 months at the earliest, and the end of the 10<sup>th</sup> year, as defined here, is no later than 121 months. Again, the standard errors show the 10<sup>th</sup>-year effect to be statistically significant for the high- and medium-FICO groups, and there is no effect for the low-FICO group. There is also no significant 7<sup>th</sup>-year effect for any group.

The cards in Figure 6 may represent a wide range of credit access, and presumably include secured cards that do not expose the issuer to any credit risk. A variable that focuses more narrowly on credit access related to credit risk is “Total number of open bank cards with a credit limit greater than or equal to \$5000.” Panel C of Table II and Figure 7 summarize the results for these high-limit cards, and shows that half of the post-flag increase in bank cards is high-limit cards. The 10<sup>th</sup> year brings one new high-limit card for every four medium-FICO filers, and for every two high-FICO filers. Low-FICO filers see no significant increase from a very low level after the bankruptcy flag.

What is the total effect on unsecured credit access, and what do the consumers do with it? A consumer’s total bank-card credit line is the sum of “Total (sum) outstanding balance on all open bank card trades,” and “Total (sum) of available credit after outstanding balance subtracted from credit limit for all open bank card trades.” Its post-bankruptcy evolution, reported as Figure 8 and Panel A of Table III, is consistent with

Table II. The average credit lines of high- and medium-FICO filers jump \$2810 and \$4578, respectively, in the 10<sup>th</sup> year, significantly more than the year before, and there is no significant 10<sup>th</sup>-year effect for the low-FICO group. The consumer's actual usage of the credit line is just "Total (sum) outstanding balance on all open bank card trades" by itself; its evolution is in Figure 9 and Panel B of Table III. The results indicate significant new unsecured borrowing by the medium-FICO group, but not the other groups, after the bankruptcy marker is removed. The high-FICO group shows a big jump from the 10<sup>th</sup> to the 11<sup>th</sup> year, but the standard error is too big for the jump to be statistically significant (n.b. there are only 56 panelists in the high-FICO/11<sup>th</sup>-year bin).

The results of this section demonstrate that a bankruptcy filing significantly constrains financing, unsecured financing in particular, for the entire period when potential creditors can observe it on credit files. Among filers, the better credits acquire substantial new access to unsecured credit when the bankruptcy finally leaves their files, and the concurrent dynamics of credit scores indicate that this reflects a big upward boost in estimated creditworthiness. But if credit scores and creditors make efficient use of bankruptcy flags, this boost is spurious, and should dissipate as new credit-file entries reveal more about true creditworthiness. The next section tests this proposition by tracking FICO scores and delinquency into the years after the post-flag increase.

#### **IV. Creditworthiness after the Bankruptcy Flag**

The previous section did not use the 9/1997 observation of scores and files because the 17-month displacement from the previous observation made it a bad fit to the test design. But since it comes last, this observation reaches farthest into post-bankruptcy

financial life and so is the best opportunity to gauge the longer-run experience of filers and their creditors.

Does the post-flag credit-score increase reverse? Before addressing this question directly, it is worth establishing the general connection between credit scores and credit-score changes. In Figure 4, lower FICO percentiles predict higher FICO percentile changes. If this mean-reversion is a general feature of FICO scores, it should be calculated and netted out. Let  $FP_{c,t}$  be consumer  $c$ 's FICO percentile as of time  $t$ . In the non-filer control sample, the OLS model is (t-statistics in parentheses):

$$FP_{c,9/1997}-FP_{c,4/1996} = 5.4768 \quad - 0.1066FP_{c,4/1996} \quad + \varepsilon_c \quad R^2 = 5.08\% \\ (26.3) \quad (-29.9) \quad N(\text{obs}) = 16701$$

FICO percentiles above the median ( $5.4768/0.1066=51.4$  is the point estimate) tend to decrease, and those below tend to increase. To isolate the bankruptcy-flag effect, the analysis of post-flag FICO changes should account for this predictive relationship.

A simple way to embed the general relation between FICO percentiles and first differences is to run the same regression as above, but with the filer and non-filer panels combined, and then sort the filers' residuals by filing month and 4/1996 FICO percentile. We already know from Table I that filers who just lost their flags as of 9/1997, i.e. those who filed just before 1/1988, and who had relatively high 4/1996 FICOs will have generally positive residuals. The new question is whether those who had recently lost their flags as of 4/1996 subsequently have *negative* residuals.

Since the database does not report 4/1996 bankruptcy flags, they have to be imputed, which can be done by analogy to Figure 2 which shows no bankruptcy flags in 7/1994 for those who filed before 11/1984. The prediction for 4/1996 is no bankruptcy flags for those who filed before 8/1986. Since the actual date on which flags are removed

is apparently somewhat random, this misclassifies some filers. All told, there are five relevant groupings of filing months:

- (1) 11/1984 – 7/1986      No flag in 4/1996
- (2) 8/1986 – 12/1987      Flag in 4/1996, not 9/1997
- (3) 1/1988 – 7/1989      Flag on both dates, no other pre-petition info on both dates
- (4) 8/1989 – 12/1990      Flag on both dates, other pre-petition info only in 4/1996
- (5) 1/1991 – 7/1994      Flag and other pre-petition info on both dates

The fitted model (t-statistics in parentheses) is:

$$FP_{c,9/1997} - FP_{c,4/1996} = 4.9469 \quad - 0.1085 FP_{c,4/1996} \quad + \varepsilon_c \quad R^2 = 4.44\%$$

(58.5)                      (-50.2)                      N(obs) = 54333

and the filers' residuals, sorted by filing quarter (rather than month, to make the graph more legible) and 4/1996 FICO percentile, are plotted in Figure 10. Means and standard errors of the five groupings are in Table IV.

The results show most of the post-flag credit-score increase quickly reversing. The high-FICO filers in group 2 gain 6¾%, but those in group 1 lose 4½%. The true amplitude of the increase-decrease pattern is probably greater, since over the 17 months the group 2 filers experience both the initial increase and some of the subsequent decrease, and some filers are misclassified. Also, many of the group 1 filers had already experienced much or all of the decrease before 4/1996. Medium-FICO filers experience score decreases after losing their flags, though there is a curious lack of increase in these results when they lose their flags, which may also reflect the long time-span; the score increase may reverse too quickly for this low-frequency test.

These results beg the question, why do the scores reverse? Since the scores are just reductions of credit files, the possibilities are that the consumers either become delinquent, or take credit-related actions that predict future delinquency. Some amount of the latter is very likely. If the Fair, Isaac algorithm associates new credit relationships

or higher usage or limits of bank-cards with greater future delinquency, then some of the decrease is just a projection of Figures 5-9. Similarly, credit inquiries, which would result from post-flag consumers testing out their new credit access, directly reduce scores.<sup>13</sup>

Since post-flag filers are a special case where the usual penalties for new-credit activity may be inappropriate, the more interesting and important consideration is their actual – rather than predicted – delinquency. After the flag-removal boosts their scores, are past filers more likely to go delinquent than non-filers with the same scores? The broadest measure of delinquency on open bank-cards is “Total number of open bank card trades presently 30 or more days delinquent or derogatory,”  $BCDEL_{c,t}$  for consumer  $c$  at time  $t$ . Notice first that  $BCDEL_{c,9/1997}$  is predicted, with coefficients significant in the right directions, by  $BCDEL_{c,4/1996}$  and  $FP_{c,4/1996}$  in the non-filer panel alone:

$$BCDEL_{c,9/1997} = 0.076 - 0.000877FP_{c,4/1996} + 0.149BCDEL_{c,4/1996} + \varepsilon_c \quad R^2 = 3.01\% \\ (19.2) \quad (-12.9) \quad (16.3) \quad N(\text{obs})=17305$$

To test the hypothesis that un-flagged filers’ credit scores underpredict delinquency, those who filed between 11/1984 and 7/1986 (i.e. group 1 from above) are added to the regression, and identified by the dummy variable  $UNFLAG_c$ . The hypothesis is the  $UNFLAG$  enters positively, and the fitted model on the combined sample is

$$BCDEL_{c,9/1997} = 0.077 - 0.000874FP_{c,4/1996} + 0.137BCDEL_{c,4/1996} \\ (19.0) \quad (-12.8) \quad (15.5) \\ + 0.011UNFLAG_c + \varepsilon_c \quad R^2 = 2.57\% \\ (1.99) \quad N(\text{obs})=19913$$

The coefficient on  $UNFLAG$  is in fact significantly positive, with a point estimate of 1.1%. The interpretation is that, 17 months down the road, the delinquency rate was 1 in 100 cards higher than the model predicted when the debtor was a past filer with no flag.

<sup>13</sup> See, e.g., “Credit rater eases multiple-inquiries penalty,” *Lexington Herald-Leader*, 1/23/1998.

## V. Summary and Conclusion

The Federal government requires credit bureaus to remove bankruptcy flags at ten years. This paper documents that the law has a significant real effect on the large and growing population of past Chapter 7 filers. Estimated creditworthiness, as represented by credit scores, and live access to unsecured credit, as represented by bank cards and their credit limits, expand rapidly over the tenth year. Most of the effect accrues to those who had relatively cleaner credit files before their flags were removed, and nothing measurable happens for the worst credits. Tracking filers further into the post-petition experience, we see that the high *ex*-flag credit scores underpredict future delinquency, and that they settle back down close to their *cum*-flag levels. There is also a seventh-year credit-score jump corresponding to the removal of other bankruptcy-related information, but its effect on credit access is at best minimal.

Consumer creditors extend excess credit because the law inflates credit scores. This may seem like a straightforward inefficiency, but the general-equilibrium implication could be different, even positive. The payoff from avoiding bankruptcy goes down when the law shortens the subsequent period of tight credit; this is a cost to the extent that it discourages repayment by those able but unwilling to repay, but a benefit to the extent that it helps the truly distressed whom bankruptcy is supposed to insure. Another potentially important consideration is that if past filings remained in view forever, past filers might have little incentive to manage credit responsibly. Consumers' sensitivity to these dynamics is potentially testable because different countries enforce

different time limits. In Canada, for example, credit bureaus report a first bankruptcy for six years, and a second one for fourteen years.<sup>14</sup>

The paper shows that consumer creditors draw negative inferences from past filings, even ten years later, and that at least some of the negativity is justified. It would be useful to know why, and several explanations are possible. Some bankruptcies are precipitated by misfortunes, such as sickness or injury, which could easily distort a consumer's incentive to spend within his means for more than ten years, while other bankruptcies reflect only the filers' disregard for their creditors, a taste they would presumably retain. Both scenarios suggest a negative inference. Similarly, a consumer who has already filed for *any* reason already bears whatever stigma applies to filers, and is therefore missing that deterrent from doing it in the future.

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<sup>14</sup> *Canadian Banker*, Jan/Feb 1997, pp. 27-29.



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**Table I**  
**One-Year FICO-Percentile Changes**

Each filer begins the  $n^{\text{th}}$  year after Chapter 7 within one month of either 7/1994, 10/1994, 1/1995 or 4/1995, for exactly one  $n$ . Filers are sorted by this  $n$ , and also by FICO percentile  $FP$  as of that date. Within each bin, the mean change of  $FP$  over the subsequent year is reported, as is the standard error (below, in italics).

$n$	$FP \in [0,10)$	$FP \in [10,20)$	$FP \in [20,30)$	$FP \in [30,40)$	$FP \in [40,50)$
2	5.53 <i>0.15</i>	4.16 <i>0.14</i>	2.66 <i>0.26</i>	-1.25 <i>0.75</i>	-0.12 <i>1.96</i>
3	5.13 <i>0.15</i>	3.07 <i>0.13</i>	1.30 <i>0.17</i>	-1.06 <i>0.45</i>	-3.23 <i>1.34</i>
4	5.42 <i>0.18</i>	3.67 <i>0.14</i>	1.60 <i>0.17</i>	-1.09 <i>0.41</i>	-1.55 <i>1.04</i>
5	4.98 <i>0.18</i>	3.12 <i>0.15</i>	0.96 <i>0.19</i>	-0.95 <i>0.38</i>	-0.69 <i>0.70</i>
6	4.94 <i>0.22</i>	3.42 <i>0.21</i>	1.56 <i>0.22</i>	-0.25 <i>0.40</i>	-1.83 <i>0.84</i>
7	6.01 <i>0.32</i>	6.64 <i>0.33</i>	5.03 <i>0.31</i>	1.94 <i>0.43</i>	-1.62 <i>0.73</i>
8	4.44 <i>0.27</i>	2.76 <i>0.34</i>	1.49 <i>0.29</i>	0.04 <i>0.31</i>	-1.71 <i>0.37</i>
9	4.49 <i>0.28</i>	2.92 <i>0.36</i>	1.51 <i>0.34</i>	-0.18 <i>0.36</i>	0.38 <i>0.62</i>
10	4.77 <i>0.38</i>	4.11 <i>0.57</i>	4.00 <i>0.60</i>	9.94 <i>0.73</i>	17.73 <i>1.41</i>
11	5.07 <i>0.70</i>	3.98 <i>1.19</i>	0.81 <i>1.33</i>	-0.38 <i>1.98</i>	-2.91 <i>2.09</i>

**Table II****One-year Changes in Active Credit Relationships**

Each filer begins the  $n^{\text{th}}$  year after Chapter 7 within one month of either 7/1994, 10/1994, 1/1995 or 4/1995, for exactly one  $n$ . Filers are sorted by this  $n$ , and also by FICO percentile  $FP$  as of that date. Those with missing FICO percentiles are assigned to “No FICO.” Within each bin, the mean change over the subsequent year in the number of active credit relationships of the given type is reported, as is the standard error (below, in italics).

*Panel A: All Open Trades*

$n$	No FICO	$FP \in [0, 16.67)$	$FP \in [16.67, 33.33)$	$FP \in [33.33, 50)$
2	0.27 <i>0.03</i>	-0.14 <i>0.02</i>	-0.06 <i>0.04</i>	0.07 <i>0.14</i>
3	0.31 <i>0.04</i>	0.00 <i>0.02</i>	0.01 <i>0.03</i>	0.17 <i>0.11</i>
4	0.42 <i>0.03</i>	0.03 <i>0.03</i>	0.14 <i>0.03</i>	-0.05 <i>0.09</i>
5	0.40 <i>0.04</i>	0.01 <i>0.03</i>	0.21 <i>0.03</i>	0.13 <i>0.12</i>
6	0.46 <i>0.05</i>	0.09 <i>0.04</i>	0.35 <i>0.04</i>	0.18 <i>0.10</i>
7	0.52 <i>0.06</i>	0.04 <i>0.04</i>	0.52 <i>0.04</i>	0.57 <i>0.08</i>
8	0.59 <i>0.05</i>	0.13 <i>0.05</i>	0.82 <i>0.05</i>	0.78 <i>0.06</i>
9	0.65 <i>0.06</i>	-0.04 <i>0.05</i>	0.90 <i>0.06</i>	0.95 <i>0.07</i>
10	0.80 <i>0.10</i>	0.12 <i>0.07</i>	1.46 <i>0.09</i>	1.34 <i>0.11</i>
11	1.04 <i>0.36</i>	0.27 <i>0.14</i>	1.77 <i>0.30</i>	1.98 <i>0.63</i>

*Panel B: All Bank Cards*

<i>n</i>	No FICO	FP $\in$ [0,16.67)	FP $\in$ [16.67,33.33)	FP $\in$ [33.33,50)
2	0.07 <i>0.01</i>	0.04 <i>0.01</i>	0.05 <i>0.01</i>	0.09 <i>0.07</i>
3	0.09 <i>0.01</i>	0.06 <i>0.01</i>	0.08 <i>0.01</i>	0.09 <i>0.05</i>
4	0.10 <i>0.01</i>	0.06 <i>0.01</i>	0.10 <i>0.01</i>	0.03 <i>0.05</i>
5	0.10 <i>0.02</i>	0.06 <i>0.01</i>	0.13 <i>0.01</i>	0.14 <i>0.04</i>
6	0.12 <i>0.02</i>	0.08 <i>0.01</i>	0.19 <i>0.02</i>	0.26 <i>0.05</i>
7	0.19 <i>0.03</i>	0.05 <i>0.02</i>	0.23 <i>0.02</i>	0.29 <i>0.04</i>
8	0.13 <i>0.02</i>	0.09 <i>0.02</i>	0.33 <i>0.03</i>	0.42 <i>0.03</i>
9	0.18 <i>0.03</i>	0.04 <i>0.02</i>	0.32 <i>0.03</i>	0.48 <i>0.04</i>
10	0.28 <i>0.04</i>	0.07 <i>0.03</i>	0.63 <i>0.05</i>	0.78 <i>0.06</i>
11	0.32 <i>0.13</i>	0.13 <i>0.06</i>	0.89 <i>0.16</i>	1.00 <i>0.38</i>

*Panel C: Bank Cards with Credit Limit  $\geq$  \$5000*

<i>n</i>	No FICO	FP $\in$ [0,16.67)	FP $\in$ [16.67,33.33)	FP $\in$ [33.33,50)
2	0.002 <i>0.004</i>	0.007 <i>0.004</i>	0.025 <i>0.008</i>	0.110 <i>0.040</i>
3	0.009 <i>0.005</i>	0.018 <i>0.004</i>	0.037 <i>0.005</i>	0.092 <i>0.033</i>
4	0.015 <i>0.005</i>	0.022 <i>0.005</i>	0.044 <i>0.006</i>	0.155 <i>0.034</i>
5	0.011 <i>0.005</i>	0.023 <i>0.005</i>	0.053 <i>0.006</i>	0.127 <i>0.027</i>
6	0.030 <i>0.010</i>	0.022 <i>0.006</i>	0.083 <i>0.008</i>	0.191 <i>0.036</i>
7	0.033 <i>0.010</i>	0.018 <i>0.008</i>	0.085 <i>0.010</i>	0.192 <i>0.031</i>
8	0.028 <i>0.007</i>	0.033 <i>0.007</i>	0.130 <i>0.012</i>	0.258 <i>0.022</i>
9	0.026 <i>0.008</i>	0.016 <i>0.007</i>	0.147 <i>0.016</i>	0.273 <i>0.024</i>
10	0.028 <i>0.012</i>	0.036 <i>0.013</i>	0.261 <i>0.027</i>	0.548 <i>0.046</i>
11	0.060 <i>0.034</i>	0.051 <i>0.024</i>	0.375 <i>0.086</i>	0.446 <i>0.170</i>

**Table III****One-Year Changes in Credit Lines and Usage**

Each filer begins the  $n^{\text{th}}$  year after Chapter 7 within one month of either 7/1994, 10/1994, 1/1995 or 4/1995, for exactly one  $n$ . Filers are sorted by this  $n$ , and also by FICO percentile  $FP$  as of that date. Those with missing FICO percentiles are assigned to “No FICO.” Within each bin, the mean change in dollars over the subsequent year of the given variable is reported, as is the standard error (below, in italics).

*Panel A: Aggregate Credit Limit of All Bank Cards*

$n$	No FICO	$FP \in [0,16.67)$	$FP \in [16.67,33.33)$	$FP \in [33.33,50)$
2	68.54 <i>33.25</i>	37.85 <i>59.75</i>	233.69 <i>62.31</i>	1354.17 <i>522.72</i>
3	129.56 <i>35.12</i>	137.85 <i>44.75</i>	304.20 <i>70.56</i>	1220.88 <i>509.31</i>
4	191.44 <i>39.06</i>	233.72 <i>57.87</i>	380.03 <i>65.92</i>	763.56 <i>216.74</i>
5	181.90 <i>53.79</i>	174.91 <i>41.41</i>	494.20 <i>56.56</i>	1075.65 <i>231.74</i>
6	324.99 <i>77.27</i>	414.04 <i>185.58</i>	917.65 <i>81.51</i>	2100.54 <i>392.23</i>
7	424.49 <i>78.65</i>	210.67 <i>70.84</i>	1027.92 <i>84.55</i>	1872.91 <i>242.19</i>
8	309.85 <i>49.17</i>	333.34 <i>62.35</i>	1520.37 <i>106.53</i>	2287.84 <i>210.41</i>
9	454.53 <i>102.63</i>	182.74 <i>68.67</i>	1574.34 <i>129.42</i>	2621.88 <i>192.70</i>
10	544.76 <i>105.00</i>	419.96 <i>170.50</i>	2810.22 <i>244.41</i>	4578.26 <i>347.09</i>
11	744.46 <i>348.09</i>	823.91 <i>370.52</i>	3595.13 <i>719.53</i>	4385.46 <i>1605.62</i>

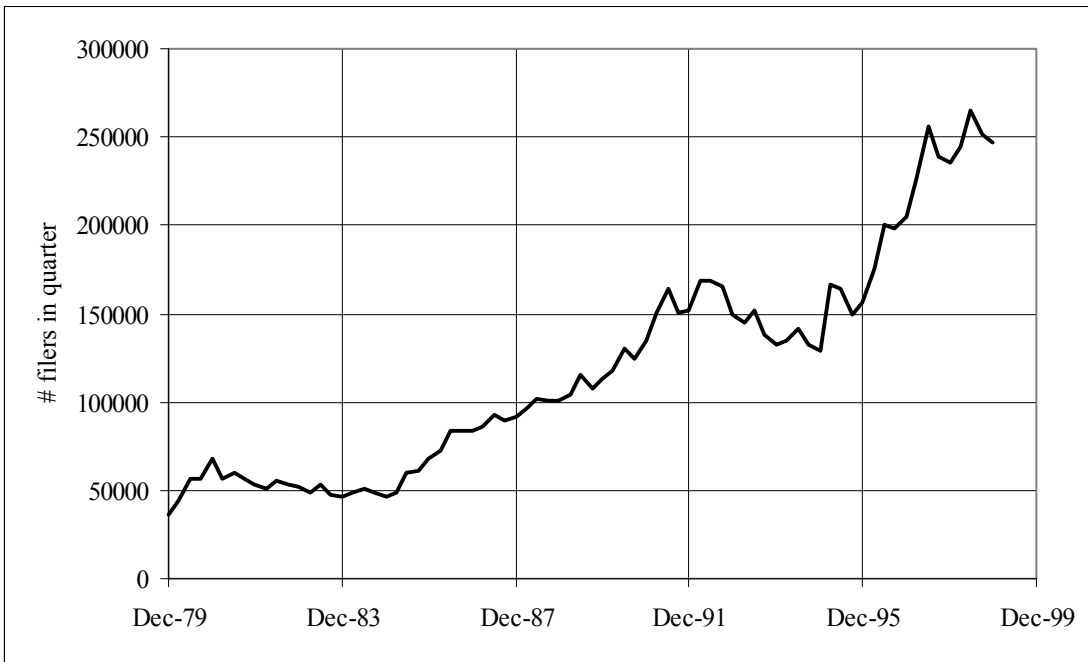
*Panel B: Aggregate Outstanding Balance on All Bank Cards*

$n$	No FICO	$FP \in [0,16.67)$	$FP \in [16.67,33.33)$	$FP \in [33.33,50)$
2	36.61 <i>10.73</i>	3.36 <i>47.72</i>	146.48 <i>58.45</i>	906.47 <i>354.51</i>
3	95.18 <i>24.86</i>	68.99 <i>37.24</i>	260.67 <i>45.68</i>	158.17 <i>826.66</i>
4	118.11 <i>24.41</i>	127.42 <i>38.16</i>	276.78 <i>50.02</i>	351.99 <i>83.62</i>
5	112.51 <i>23.13</i>	126.84 <i>31.99</i>	301.09 <i>47.31</i>	423.54 <i>119.13</i>
6	192.98 <i>40.04</i>	314.07 <i>182.26</i>	570.70 <i>56.76</i>	833.40 <i>261.45</i>
7	243.23 <i>44.28</i>	117.99 <i>61.10</i>	602.24 <i>69.71</i>	846.60 <i>140.21</i>
8	183.79 <i>33.58</i>	205.05 <i>45.98</i>	846.12 <i>81.15</i>	1005.12 <i>144.59</i>
9	283.44 <i>65.35</i>	118.08 <i>62.58</i>	946.43 <i>98.95</i>	1416.87 <i>139.91</i>
10	339.28 <i>74.42</i>	227.85 <i>141.88</i>	1638.10 <i>169.60</i>	1394.73 <i>163.66</i>
11	339.84 <i>147.48</i>	756.48 <i>364.59</i>	1879.53 <i>365.98</i>	2601.93 <i>803.75</i>

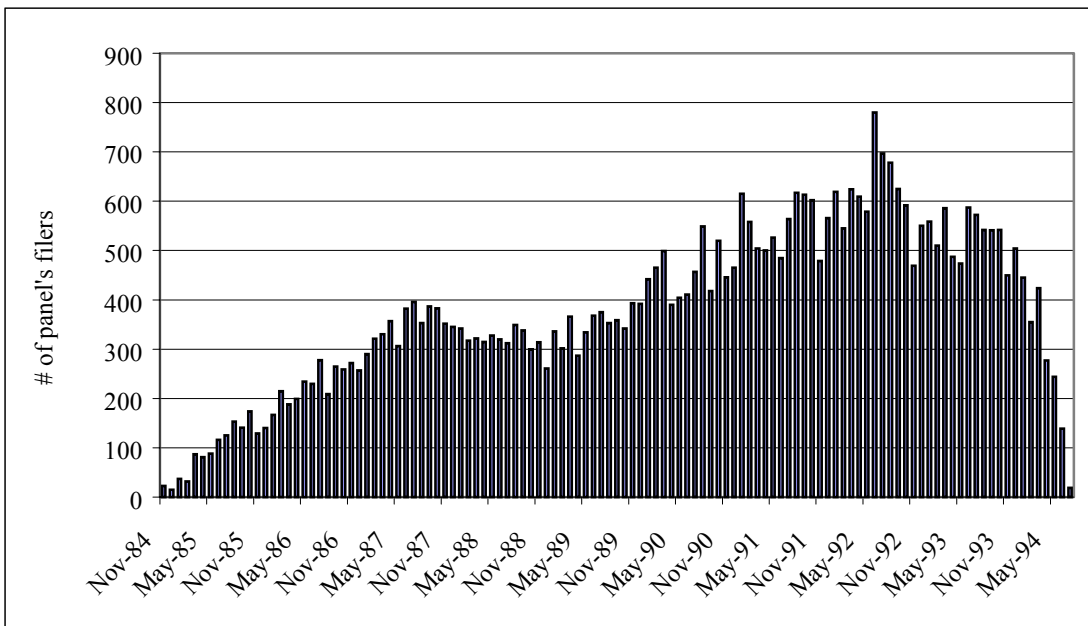
**Table IV**  
**Filers' Excess FICO-Percentile Changes**

The filers' residuals from the regression of  $FP_{c,9/1997} - FP_{c,4/1996}$  on  $FP_{c,4/1996}$ , where  $FP_{c,t}$  is the time  $t$  FICO percentile of consumer  $c$  and all filers and non-filers are included in one regression, are sorted by  $FP_{c,4/1996}$  into  $[0,16.67)$ ,  $[16.67,33.33)$ , and  $[33.33,50)$ , and by filing month into  $[11/1984,7/1986]$ ,  $[8/1986,12/1987]$ ,  $[1/1988,7/1989]$ ,  $[8/1989,12/1990]$ , and  $[1/1991,7/1994]$ . Means of residuals in each bin are reported; standard errors are below in italics.

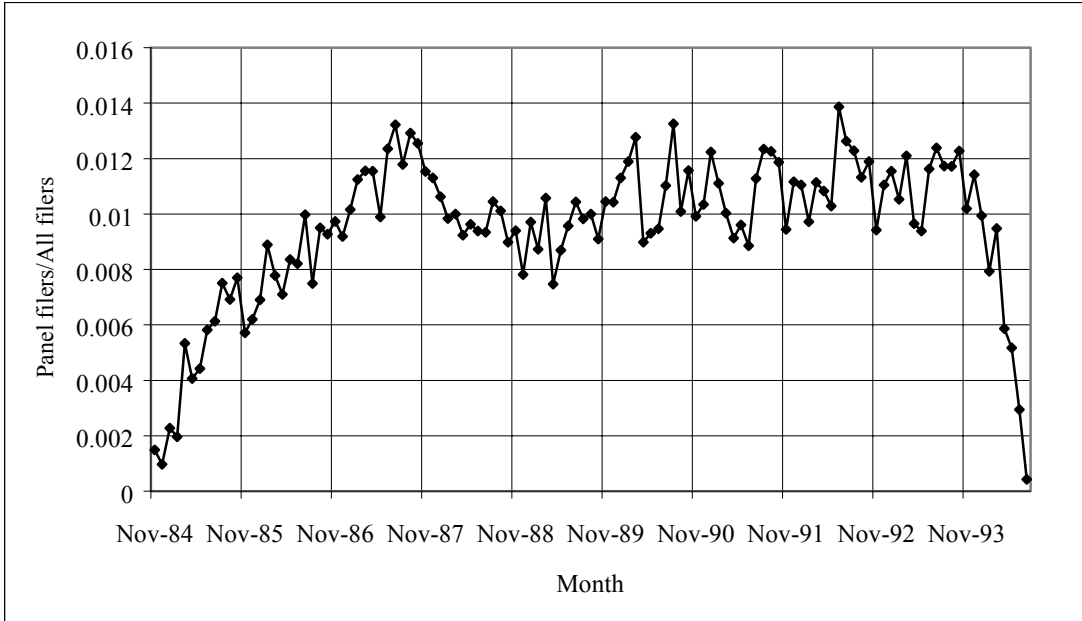
<i>filing month</i>	<i>FP</i> ∈ $[0,16.67)$	<i>FP</i> ∈ $[16.67,33.33)$	<i>FP</i> ∈ $[33.33,50)$
11/1984-7/1986	-0.13 <i>0.30</i>	-3.10 <i>0.48</i>	-4.56 <i>0.68</i>
8/1986-12/1987	0.66 <i>0.23</i>	-0.20 <i>0.32</i>	6.75 <i>0.51</i>
1/1988-7/1989	0.36 <i>0.22</i>	-0.95 <i>0.24</i>	0.77 <i>0.34</i>
8/1989-12/1990	1.81 <i>0.20</i>	2.43 <i>0.20</i>	-0.67 <i>0.32</i>
1/1991-7/1994	0.72 <i>0.09</i>	-2.15 <i>0.09</i>	-2.89 <i>0.23</i>



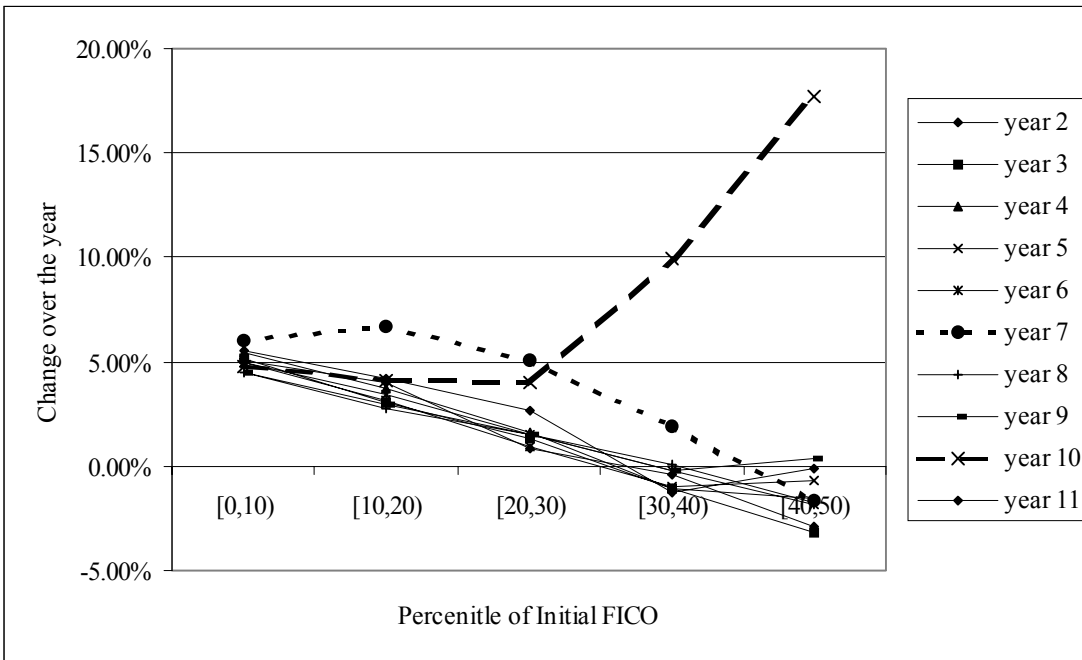
**Figure 1.** Non-business Chapter 7 filings, by quarter (source: Administrative Office of the United States Courts).



**Figure 2.** Distribution of panel's filers across filing months.



**Figure 3.** Ratio of panel's filers to country's filers, by month.



**Figure 4.** Change in FICO percentile over the  $n^{\text{th}}$  year, sorted by initial percentile.



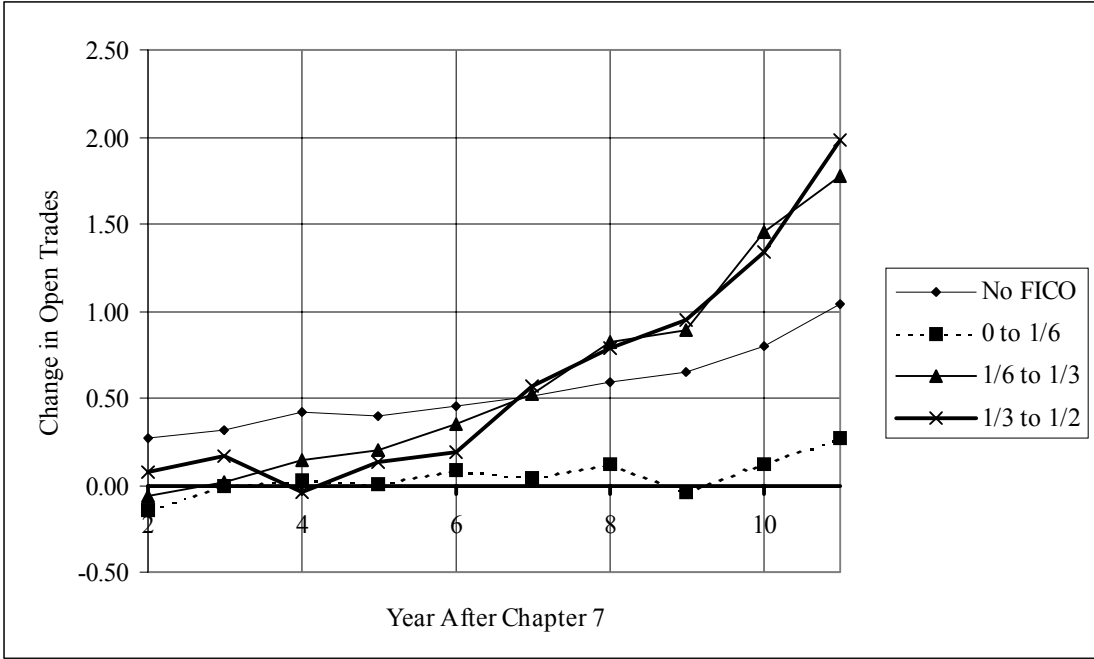


Figure 5. Change in Total number of open trades over the  $n^{\text{th}}$  year, sorted by initial FICO percentile.

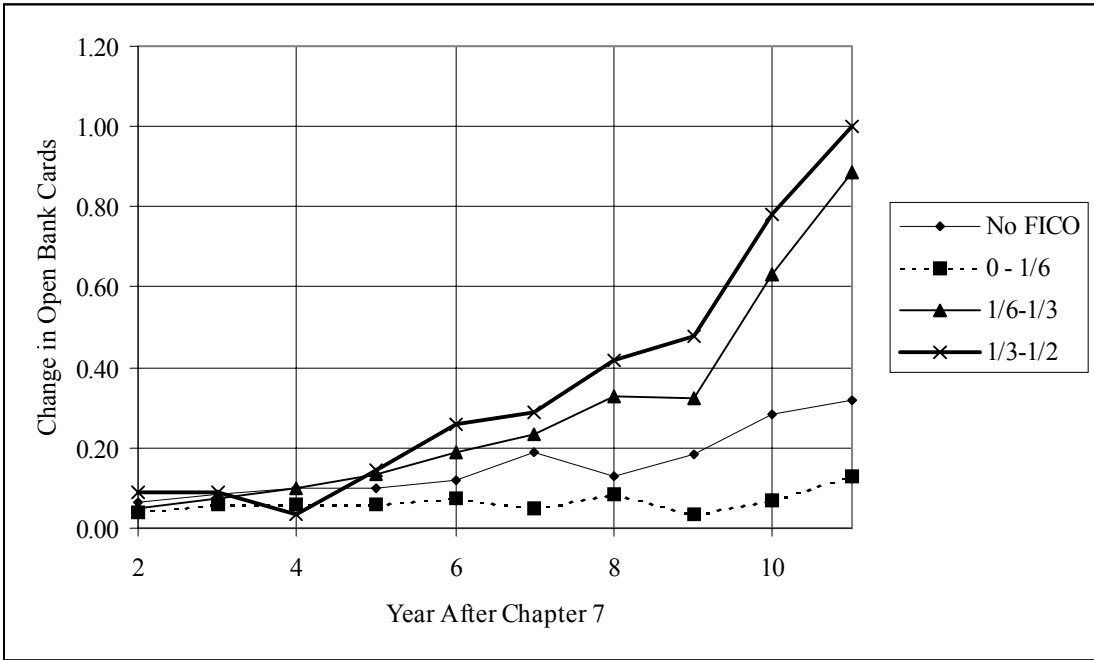
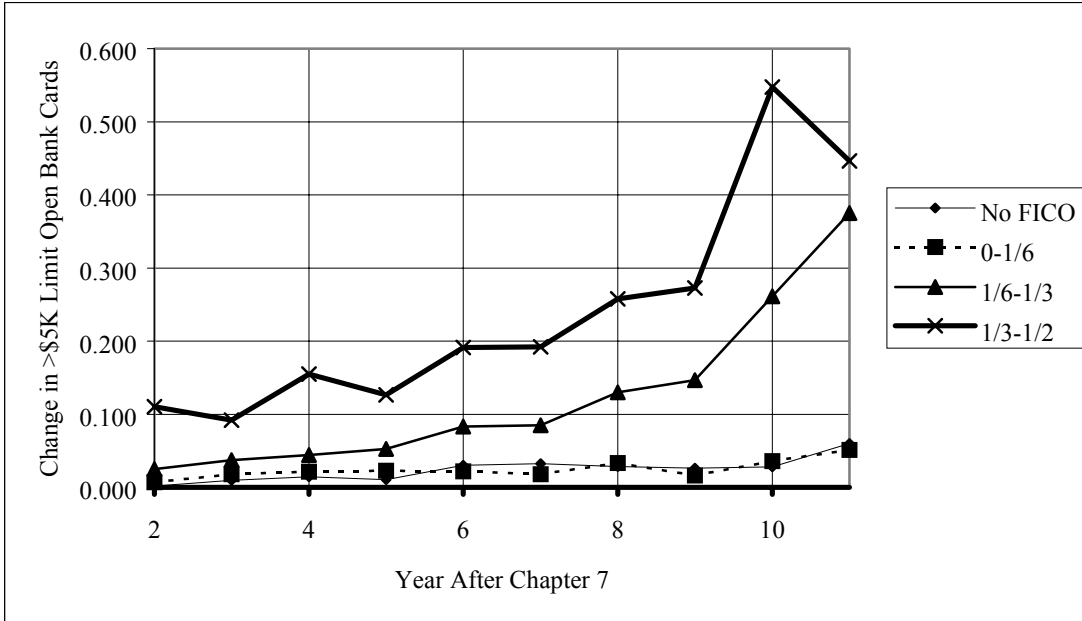
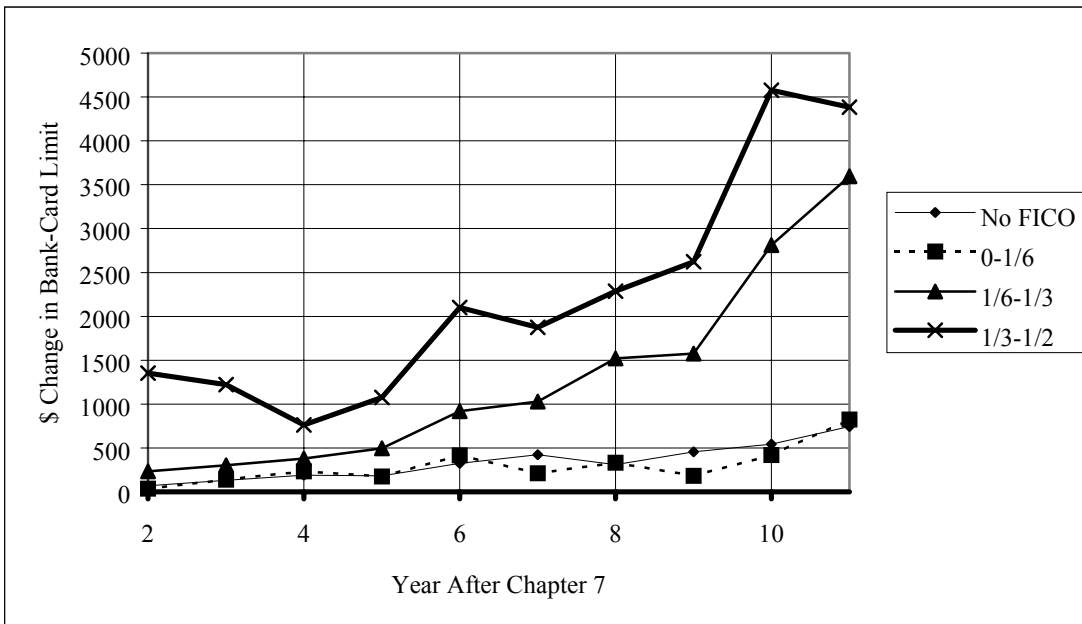


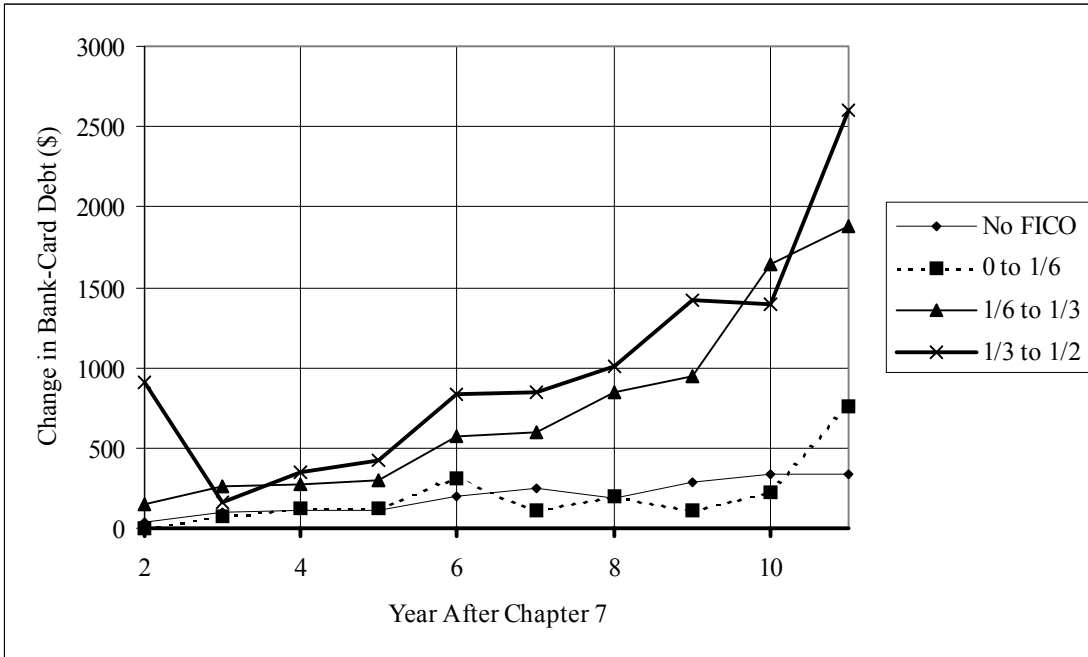
Figure 6. Change in Total number of open bank cards over the  $n^{\text{th}}$  year, sorted by initial FICO percentile.



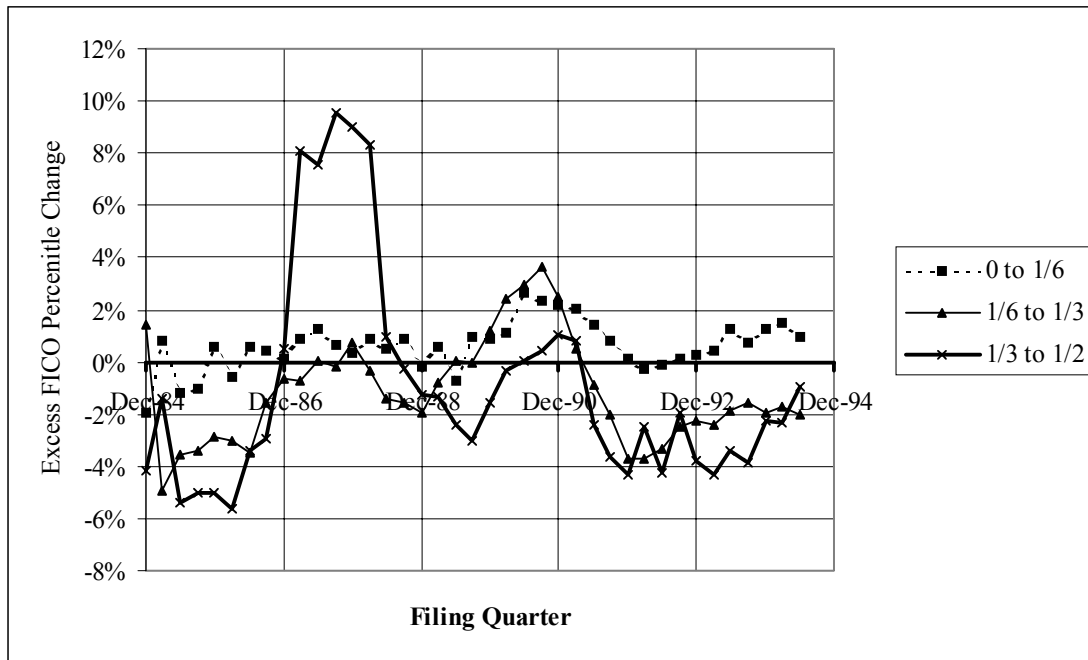
**Figure 7.** Change in Total number of open bank cards with a credit limit greater than or equal to \$5000 over the  $n^{\text{th}}$  year, sorted by initial FICO percentile.



**Figure 8.** Change in Total (sum) outstanding balance on all open bank card trades plus Total (sum) of available credit after outstanding balance subtracted from credit limit for all open bank card trades over the  $n^{\text{th}}$  year, controlling for initial FICO percentile.



**Figure 9.** Change in *Total (sum) outstanding balance on all open bank card trades* over the  $n^{\text{th}}$  year, sorted by initial FICO percentile.



**Figure 10.** Change in FICO percentile from 4/1996 to 9/1997, in excess of change predicted by 4/1996 FICO, by filing-quarter and 4/1996 FICO percentile.