

Insolvency After the 2005 Bankruptcy Reform*

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Abstract

Using a comprehensive panel dataset on U.S. households, we study the effects of the 2005 bankruptcy reform on bankruptcy, insolvency and foreclosure. We find that the reform coincided with a 11% permanent drop in the bankruptcy rate relative to pre-reform level, and that this drop can be explained by liquidity constraints stemming from the rise in filing costs associated with the reform. We find that the non-filing individuals are shifting into persistent insolvency and foreclosure. We also show that insolvency is associated with worse financial outcomes than bankruptcy, as individuals in this state accumulate collections, judgements, do not have access to new lines of credit, and their credit score bottoms out.

1 Introduction

This paper studies the impact of the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act on bankruptcy, insolvency and foreclosure behavior of U.S. households. The Act is the single most important piece of legislation regarding personal bankruptcy since the Bankruptcy Reform Act of 1978. It introduced more stringent eligibility requirements for individuals intending to file for bankruptcy protection, and substantially increased monetary and non-monetary costs of filing.

One of the major consequences of the law's new requirements was a sizable rise in the filing cost, predominantly driven by increases in lawyer fees. Median attorney fees increased by 38% for Chapter 7 filers, from an average of \$663 dollars pre-reform to \$986 post-reform

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(Jones (2008), Lupica (2010), White (2007)). Given the extreme low incomes of filers pre-reform and the fact that bankrupt households are often cash poor (Mann and Porter (2009), Gross, Notowidigdo, and Wang (2012)), cost changes of this magnitude can significantly affect potential filers' options. Thus, the reform can be used to assess the impact of liquidity constraints on bankruptcy filing behavior. Both the initial level of filing costs and the size of their change associated with the reform exhibit sizable cross-district variation, and we exploit this geographic variation to identify the impact of liquidity constraints on household behavior.

Our analysis is based on a large, nationally representative panel of credit files for U.S. households from 1999 to 2013. These data allow us to observe the drop in bankruptcies and the changing characteristics of bankrupts, as well as the behavior of financially distressed individuals who post-2005 decide not to file for bankruptcy. Hence, we are the first to assess the financial situation of the individuals who no longer file for bankruptcy.¹ We find that these individuals experience persistent insolvency and exhibit high foreclosure rates. Notably, the probability of becoming current after a minor delinquency falls sizably after the reform, suggesting that the increased hurdles associated with filing for bankruptcy protection do not deter escalation of delinquency, as conjectured by the proponents of the reform.

We provide four sets of empirical findings. First, we estimate transition probabilities, based on frequency distributions of individuals in our dataset, for a set of mutually exclusive states ranging from no delinquencies, to insolvency, bankruptcy and foreclosure. One of the goals of this exercise is to examine the pattern of transition after a minor delinquency pre- and post-reform. We find a sizable and persistent drop in transitions into bankruptcy at all horizons, starting exactly in the quarter following the introduction of the Act. This drop is concentrated among non-homeowners and individuals with low prior credit scores, who are concentrated at the bottom of the labor income distribution. We show that the drop of transitions into bankruptcy is associated with a large increase in the fraction of individuals who transition into insolvency.² Both the drop in bankruptcy and the increase in insolvency are very persistent. For example, for the average household who first shows a minor delinquency,

¹A large literature following the Act's introduction studies its effects on the composition of the cohorts of bankrupts, mainly basing the findings on surveys of bankrupts or bankruptcy courts data. In a leading study, Lawless et al. (2008) use the 2007 Consumer Bankruptcy Project to document the changes in the characteristics of bankrupts when compared with data from similar studies in 1981, 1991 and 2001. They find that the the Act did not change the income composition of bankrupts but increased their in-bankruptcy debt and the length of time before filing. One limitation of these studies is that they focus solely on a small sample of bankrupt individuals from a selected number of states. These data, in addition to not being fully representative, are not equipped to investigate what happened to the 'missing' bankrupts, that is the households who would have filed for bankruptcy absent the reform.

²Individuals are insolvent if they have debt 120+ days late or charged off.

the probability of bankruptcy (with no foreclosure) 12 quarters later drops from 2.6% pre- to 2% post-reform, while the probability of insolvency (without bankruptcy or foreclosure) 12 quarters ahead rises from around 15% pre- to 17% post-reform. These findings suggest that the households who would have filed for bankruptcy pre-2005 are now pushed into insolvency and are not able to pay off their debts. We also find that starting with the first quarter after the reform there is a large and persistent rise in foreclosure rates. We interpret this outcome as resulting from insolvent households resorting to default on secured debt, having lost the option to default on their unsecured debt.³

Our second set of results exploits the cross-district variation in the change in filing costs associated with the reform using regression analysis. First, we examine the quantitative response of bankruptcy rates to the reform through the change in the filing costs at the district level. We find a statistically and economically significant impact of the cost change. Our estimates imply that moving from the 10th to the 90th percentile of the cost change distribution increases the drop in bankruptcy by 24 percentage points. To control for potential joint endogeneity of the cost changes to the bankruptcy rates, we instrument the cost change by composition of the political affiliation of the bankruptcy court at the time of the reform (in 2004). Our estimates imply that moving from the 10th to the 90th percentile of the cost change distribution increases the drop in the bankruptcy rate by 11 percentage points, 21% for the 52% median drop in bankruptcy filings.

The third component of our analysis quantifies the substitution from bankruptcy to foreclosure and insolvency post-reform. In particular, for newly insolvent individuals, we construct the 4-quarter and 8-quarter-ahead transition probabilities to foreclosure, bankruptcy, remaining insolvent and turning current. For these variables, we document several robust patterns. First, the transition to bankruptcy falls significantly at both horizons, with the effects in the instrumental variable estimation about twice as large as for the unconditional regressions. Second, we find that while the cost per se has no effect on the transitions to foreclosure and insolvency, the bankruptcy rate does. In particular, we find that larger drops in bankruptcy transitions of newly insolvent individuals are associated with sizable increases in the persistence of insolvency and transitions into foreclosure. At the 4 quarter horizon the median bankruptcy flow drop (56%) increases the persistence of the insolvency state by 3% and the flows into foreclosure by 27%. Interestingly, we do not find a relation between the drop in the flows into bankruptcy and the flows into current.

To conclude the analysis, we compare indicators of financial distress for individuals who

³Given the homestead exemption, most bankrupt households can retain their main residence and continue to service real estate debt associated with that property.

file for bankruptcy after an initial insolvency and individuals who do not file. As we have shown, the decline in bankruptcy due to the reform is associated with a rise in insolvency, with and without foreclosure. It is therefore important to determine whether this development is consequential for households. We adopt an event study approach and consider cohorts of individuals who become insolvent at a given quarter after two year spell with no insolvency, bankruptcy or foreclosure, distinguishing those who go bankrupt in the 8 quarters after and those who dont. We then examine the behavior of several financial indicators for a 2 year windows around that new insolvency.

We find that the balances in collection and the fraction of individuals with court judgments grow after insolvency, whereas bankruptcy filing immediately stays collection efforts and court judgments. Also, among individuals who become newly insolvent at a given date, those who go bankrupt open a larger number of new unsecured accounts. Since the number of inquiries is very similar across the two groups, this outcome is driven by difference in access to credit. Turning to credit scores, we find that the individuals who do go bankrupt initially have lower credit scores. However, they experience a sharp boost in their credit score after bankruptcy, whereas credit scores recover at a much slower pace for individuals who remain insolvent.

The rest of the paper is organized as follows. Section 2 provides a short overview of the bankruptcy law in the U.S., including the changes implied by the 2005 reform. Section 2.1 describes the credit file data used in the analysis. Section 3 reports our estimates of transition probabilities into various delinquency states. Section 4 describes our cross-district regression analysis. Section 5 examines the consequences of the substitution into insolvency from bankruptcy. Section 6 concludes, and the Appendix presents additional set detailed results.

2 The 2005 Bankruptcy Reform

Households in financial distress in the U.S. have two main options for resolution through bankruptcy: filing for Chapter 7 or Chapter 13 bankruptcy. Upon filing, debtors obtain immediate relief from all collection efforts, including direct communication, lawsuits and wage garnishment. Most unsecured debt is dischargeable under either chapter, excluding most taxes, alimony and child support obligations, student loans and debt obtained by fraud.

Chapter 7, usually called ‘straight bankruptcy’ or a ‘fresh start’ option, is the most commonly used procedure for bankruptcy - up to 2005 a remarkably stable 70% of bankruptcies

were Chapter 7 bankruptcies. Under Chapter 7, filers submit a list of all their assets to the courts. The part of the assets which exceeds certain exemption levels⁴ is then used to satisfy unsecured creditors. The rest of the debts are discharged, and debtors are not obliged to use future income for debt repayment (hence ‘fresh start’). Chapter 7 bankrupts are not allowed to re-file another Chapter 7 case for the next 6 years (increased to 8 by the 2005 Act), and have a bankruptcy flag on their credit report for 10 years after filing.

Under Chapter 13, bankrupts keep all of their assets, but must use their future income to repay part of their unsecured debt⁵. Debtors propose their own repayment plans (pre-2005, post-2005 they must use all of their law-defined disposable income to pay off debts) lasting 3-5 years, with the restriction that the total proposed repayment cannot be lower than the value of their non-exempt assets under Chapter 7. A Chapter 13 bankruptcy is considered discharged after the debt repayment plan has been executed, and the Ch.13 bankruptcy flag stays on the credit record for 7 years after discharge.

Historically, ever since the introduction of the bankruptcy law as we know it, both unsecured debt levels and bankruptcy rates have been rapidly rising over time (the trend extending all the way back to 1978), which gave rise to numerous studies on the sources of the rise⁶, as well as active policy discussion on the efficiency of existing law. That discussion resulted in the passing of the 2005 Act, the main provisions of which we discuss below.

The BAPCPA was signed by president George W. Bush on April 20, 2005 and applied to bankruptcy cases filed on or after October 17, 2005. It introduced several major changes to bankruptcy regulation which increased the burden, financial and otherwise, of filing for bankruptcy protection. Among the most notable new features are the introduction of an income ‘means test’ which determines eligibility for filing for Chapter 7 bankruptcy; the abolishment of the possibility of filers to propose their own Chapter 13 plans; and a significant increase in the filing documentation burden, which drove up the cost of filing significantly (Jones (2008) reports an average increase in lawyer fees alone of 50%).

The cost change The feature of the new law we highlight and exploit in this paper is the increased financial cost associated with filing. Among the newly introduced provisions,

⁴Asset exemptions are determined at the state level. Exempt assets may include clothing, furniture, ‘tools of trade’, a vehicle up to some value. Additionally, most states have homestead exemptions, which protect equity in the house up to a state-level specified limit.

⁵More debts are dischargeable under Chapter 13 than Chapter 7, including some car loans and debts incurred by fraud or cash advances shortly before filing (the so called ‘super discharge’).

⁶Including Athreya (2002), Domowitz and Eovaldi (1993), Domowitz and Sartain (1999), Gross and Souleles (2002), Fay, Hurst, and White (2002), Livshits, MacGee, and Tertilt (2007), Livshits, MacGee, and Tertilt (2010).

the Act requires debtors to enroll in a credit counseling class before they file and a financial management course before their debts are discharged. They must file detailed financial information with the bankruptcy court, essentially showing proof of sufficient indebtedness and inability to pay, as well as good faith attempts at paying back. Bankruptcy lawyers must certify the accuracy of the information, with strict fines for inaccuracies. As a result the total out-of-pocket cost of filing for bankruptcy increased from \$600 and \$1600 for Chapters 7 and 13 to \$2500 and \$3500, respectively (White (2007), also consistent with findings in Lupica (2012)).

2.1 Data Used in the Analysis

We use the Federal Reserve Bank of New York’s Consumer Credit Panel (CCP) data, which is a longitudinal panel of individuals with quarterly frequency, starting in 1999:Q1 and ending in 2013:Q3. The panel includes all individuals who have a credit report with Equifax. The data is described in detail in Lee and van der Klaauw (2010). In most of the analysis, we use a 5% sample from the database, including information on approximately 40 million individuals in each quarter.⁷

The data contains over 600 variables⁸, allowing us to track all aspects of individuals’ financial liabilities, including bankruptcy and foreclosure, mortgage status, detailed delinquencies, various types of debt, with number of accounts and balances. Apart from the financial information, the data contains individual descriptors such as age, ZIP code and credit score. The variables included in our analysis are described in detail in a online Appendix A.

3 Transitions

To understand the dynamics of bankruptcy and delinquency behavior, we compute the paths of behavior of individuals in our dataset, given initial conditions. This approach uses to the full extent the panel nature of our data - we can track where each individual ends up at different horizons, given her initial financial state. This gives rise to a set of Markov transition matrices (one for each quarter) which describe the evolution of our population over time.

⁷The results presented here are based on a smaller 1% sample.

⁸For data dictionary, go to http://www.newyorkfed.org/householdcredit/2013-q3/data/pdf/data_dictionary_HHDC.pdf.

Specifically, we compute transition probabilities based on frequency distributions of individuals, for a set of mutually exclusive delinquency states. In any given quarter, an individual’s state is Current, if there are no delinquencies of any type in her record for that quarter, and no bankruptcy or foreclosure flags. An individual’s state is Delinquent, if she has accounts that are 30, 60 or 90 days delinquent. An individual’s state is Insolvent if she has any account that is 120 days plus delinquent or in charge-off. An individual is in foreclosure, if she has a foreclosure flag and she is in bankruptcy if she has a bankruptcy flag. The foreclosure flag is activated by a new foreclosure record on the individual’s account, and lasts for 7 years from its first appearance. The bankruptcy flag is activated by a new bankruptcy record (voluntary or involuntary, both Ch.7 and Ch. 13) and lasts for 10 years after its first appearance.

This yields the following set of mutually exclusive states: Current, Delinquent, Insolvent. These states can occur with no foreclosure (NF) or with foreclosure (YF) if an individual is not in bankruptcy (NB). Alternatively, an individual can be in bankruptcy (YB), with or without a foreclosure flag, leading to a total of 8 possible states.

To examine the effects of the bankruptcy reform, we estimate the 1-quarter-ahead transition probabilities across these states for each quarter in the sample, and use them to conduct simulations of 4 quarter ahead transition probabilities. We first consider these transitions for the overall population, and then differentiate by credit scores and home ownership status.

Figure 1 displays the four-quarter-ahead probability of being in selected states for an individual who is currently Delinquent NB NF⁹. We view Delinquent, which includes relatively minor delinquencies, as the most relevant state for our evaluation, as it captures individuals who are potentially at the start of financial turmoil. The vertical line corresponds to the first quarter of implementation of the 2005 bankruptcy reform, and the shaded areas correspond to NBER recessions. The solid blue lines correspond to the transition estimates for the overall population.

There is a clear discontinuity in the transition probabilities before and after the 2005 reform. Specifically, conditional on no foreclosure, there is a sharp rise in the transition probability into Insolvent (about 5 percentage points), a marked decline in the probability of becoming Current (about 10 percentage points), and a decline in the probability of bankruptcy (from about 1% to about 0.6%). The probability of remaining Delinquent also declines slightly.

Figure 2 presents the shares of transitions into each of the states with foreclosure. The right panel presents data for the overall sample, for which Insolvent accounts for approxi-

⁹Delinquent NB NF, Current and Bankruptcy are the three most populous states in the data.

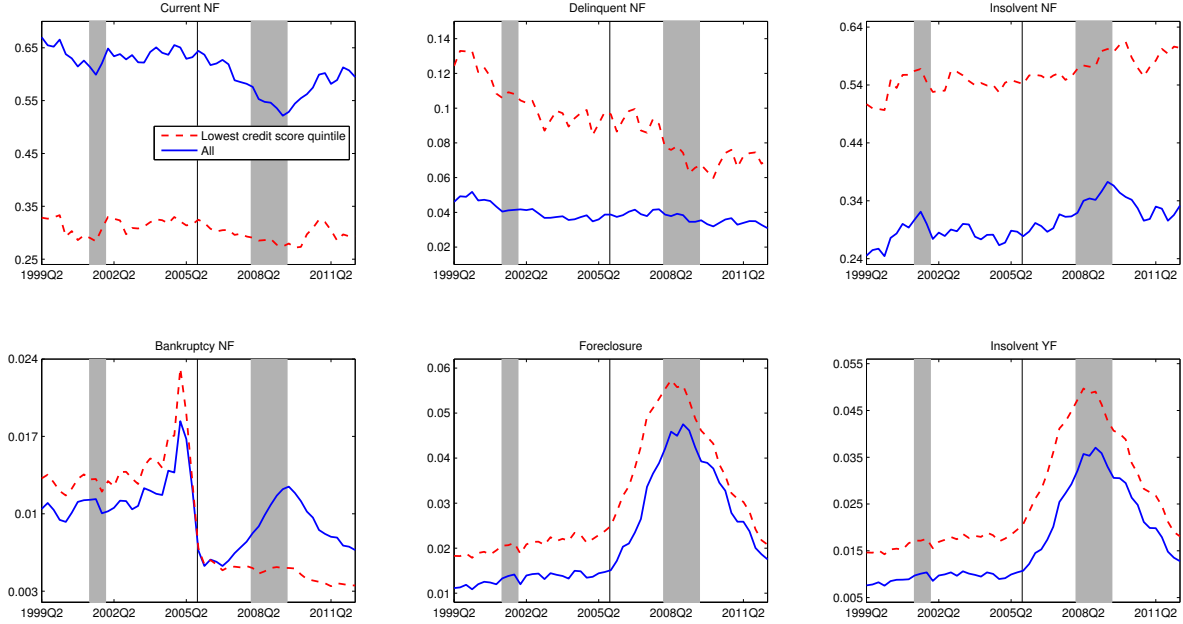


Figure 1: Four quarter ahead transition probability from Delinquent NB NF. All, 1% sample.

mately 80% of all the flows into foreclosure from Delinquent NF NB, followed by Current which accounts for approximately 20% of all flows. The share of transitions into Insolvent rise and the share of transitions into Current fall at implementation of the reform. The share of transitions into bankruptcy with foreclosure is less than 5% before the reform, and drops to approximately 1% post reform.

One plausible explanation for the pre- and post-reform behavior is that the large rise in filing cost associated with the reform made it too expensive for certain individuals to file. Moreover, these individuals, if indeed liquidity constrained, would likely end up in insolvency, rather than paying off their debts and becoming current. This is consistent with the findings in Gross, Notowidigdo and Wang (2012), who find that bankruptcy filings rise for individuals who receive tax rebates. The Equifax data does not provide individual income. However, for 2009, we have access to payroll data from a large income verification firm, linked to Equifax. As shown in Appendix B, for 2009, we can show that there is a strong correlation between an individual's position in the credit score distribution and her position in the income distribution. Individuals in the bottom quintile of the credit score distribution have a 36% probability of being in the bottom quintile of the labor income distribution and a 56% probability of being in the lowest two quintiles of the labor income distribution. By contrast, individuals in the top quintile of the credit score distribution have at 42% probability of belonging to the top quintile of the income distribution.

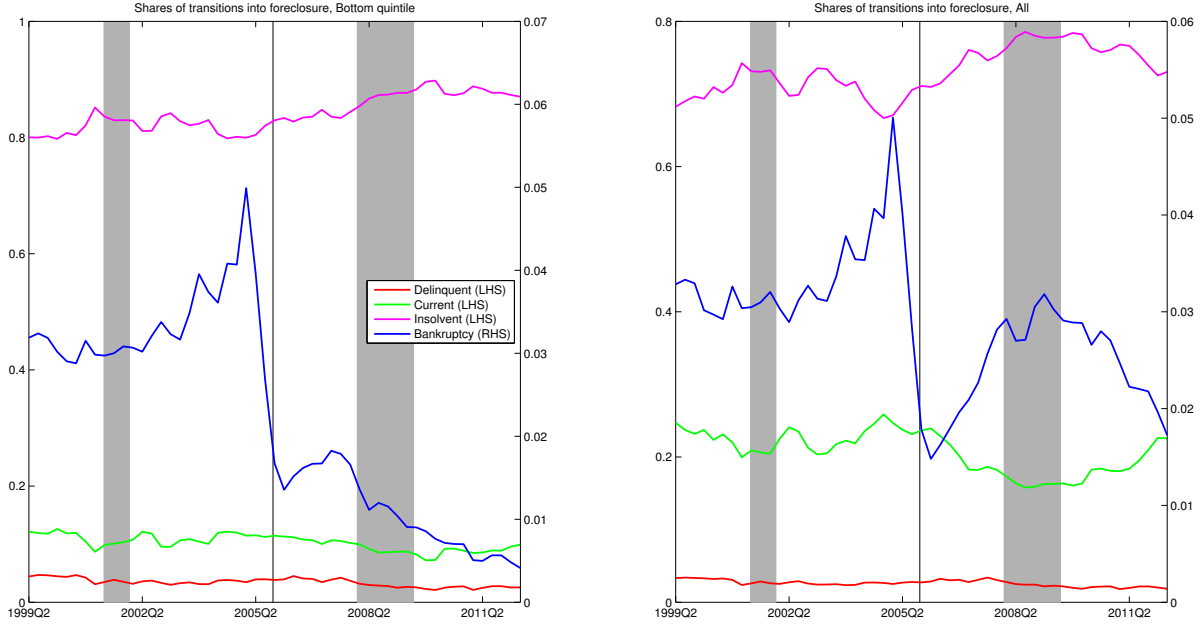


Figure 2: Four quarter ahead transition probability from Delinquent NB NF into foreclosure NB. Fraction of transitions into each sub-state. All, 1% sample.

Based on this evidence, we posit that liquidity constraints should be strongest for individuals at the bottom of the credit score distribution, and we repeat our transition analysis for individuals in the bottom 20% of the credit score distribution. To avoid joint endogeneity concerns, we rank individuals based on the credit score at $t - 4$ when estimating the transition probabilities between t and $t + 1$.¹⁰ The resulting estimated transition probabilities for the bottom 20th percentile of the credit score distribution are presented in the dashed green lines in figure 1 and in the left panel of figure 2.

The estimates indicate that the effects of the reform are much more pronounced for individuals in the first quintile of the credit score distribution. For this group, individuals who start in Delinquent NB NF, most likely end up Insolvent NB NF, and the frequency of that transition rises from about 54% pre-reform to around 61% post-reform, with the increase occurring immediately after the reform. The transition into insolvency peaks at the height of the financial crisis and 2007-09 recession for both the bottom quintile of the credit distribution and the overall population. While for the overall population the bankruptcy rate also rises, albeit to a much lower level relative to the pre-reform average, the transition into bankruptcy remains completely flat for bottom quintile the bankruptcy rates remain flat.

¹⁰We also estimate versions in which the ranking by credit scores is performed at $t - 2$ and t for the transition between t and $t + 1$. The results are very robust to these alternative rankings.

This discrepancy in the relation between the transition into insolvency and into bankruptcy between the bottom quintile of the credit score distribution and the overall population at the height of the financial crisis strongly suggests that the bottom quintile did not file for bankruptcy because of a binding constraint, which we take to be insufficient liquid funds to clear the fees associated with bankruptcy. Furthermore, figure 2 shows that the share of flows into foreclosure with Insolvent is about 10 percentage point greater for this group, and the share of flows into foreclosure with Current is approximately half than that in the overall population. The drop in the share of flows into bankruptcy with foreclosure is larger for individuals in the bottom quintile of the credit score distribution.

In the Appendix, we also report the estimated transition probabilities for individuals in the 40-59% of the credit score distribution (third quintile), and in the top 20% of the credit score distribution (fifth quintile). These results are presented in figure 17. It is clear from these charts that the effects of the bankruptcy reform are concentrated among the bottom quintile of the credit score distribution, as the response is an order of magnitude smaller for the groups with higher credit scores. For the middle and top quintiles, the transitions to both the insolvent and bankruptcy state are clearly linked to the crisis, with both rising much later in the sample. Moreover, for the top quintile of the credit score distribution, the flow into foreclosure is exactly zero.

To summarize, the estimated transitions suggest that post-reform, the probability of transitioning into bankruptcy and Current from Delinquent without foreclosure or bankruptcy drop sizably, while the probability of transitioning into insolvent and all states with foreclosure rises sizably, at the 4 quarter horizon. To capture the average post- and pre-reform behavior of individuals, we compute the mean transition probability matrix for 1999Q2-2005Q1 and separately for 2006Q2-2013Q3. Hence we cut out 1 year¹¹ around the implementation of the bankruptcy reform, and look at the average transition estimates pre- and post-reform. This allows us to compute the average pattern at different horizons, when we start a representative individual in the same state in the pre- and post- sub period.

The results for individuals starting in the Delinquency NB NF state are displayed in figure 3. The horizontal axis corresponds to the transition horizon in quarters. We report only the set of states that display the largest responses to the reform. Conditional on no foreclosure, these are Insolvent and Bankrupt. As shown in the figure, there is a sharp rise in the transition probability of having insolvent accounts at all horizons, approximately 5 percentage points at the peak, approximately 17%. There is also a large decline in the Ch.

¹¹We also experimented with cutting out 2,3 or 4 years around the bankruptcy law change. None of these choices changes our results.

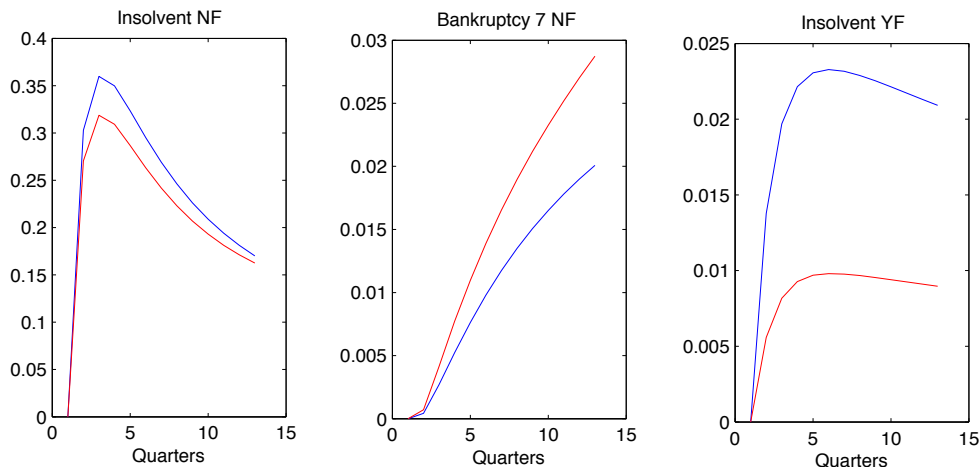


Figure 3: One to 12 quarter ahead transition probability from Delinquent NB NF, using average pre- (red line) and average post-reform (blue line) transition probabilities. All, 1% sample.

7 bankruptcy rate, approximately 35%, also at all horizons. For the bankruptcy rate, the percentage decline increases at higher horizons, confirming that the decline in the bankruptcy rate is permanent, and not just a delay in filing, relative to pre-reform. There is also a very sizable rise of the probability of transitioning into states with foreclosure, specifically in the transition probability into Insolvent, which accounts for approximately 80% of the transitions into foreclosure. The transition probability into Insolvent with foreclosure from Delinquent with no foreclosure, more than quadruples at horizons greater than or equal to 4 quarters.

3.1 Analysis by Home Ownership Status

We now repeat the analysis distinguishing between homeowners and non-homeowners. In Appendix B, we present data on income by homeownership status for 2009 that suggest that labor income is significantly lower for non-homeowners, so this analysis provides more evidence in support of the notion that liquidity constraints drive the response to the reform. Additionally, non-homeowners will not be affected by the foreclosure crisis, and provide a sample for which it is easier to assess the substitution between bankruptcy and insolvency, without interference from this event. On the other hand, the transition into foreclosure can only be experienced by current homeowners, which makes it easier to assess the salience of the substitution between bankruptcy and foreclosure.

The way to identify homeowners in our sample is by the presence of any outstanding real estate debt. Specifically, ‘Current homeowners’ are those individuals who display any

type of real estate debt in the last 4 quarters, whereas ‘Current non-homeowners’ do not have any type of real estate debt on their records in the last four quarters. Real estate debt includes first mortgages and home equity lines of credit. Non-homeowners will be generically negatively selected, as this group will disproportionately include individuals whose credit history is too short or whose credit score is too low to qualify for a mortgage. However, given our definition of homeownership, it could include owners who did not need borrow to purchase a home or already payed off their real estate debt. For Current homeowners, the probability of being in the lowest quintile of the labor income distribution is 10%, while it is 34% for non-homeowners. By contrast, current homeowners’ probability of being in the top quintile of the labor income distribution is 31%, while it is 8% for current non-homeowners.¹²

We also study a more restrictive definition of homeownership. Specifically, we split the sample into ‘Never Homeowners,’ that is individuals who never report any type of real estate on the record, and ‘Ever Homeowners,’ that is individuals who for at least one quarter display non-zero (and non-missing) real estate debt. Even this very stringent definition could still include some effective home owners into the non-homeowner group. Our main findings on the differences in behavior between homeowners and non-homeowners are confirmed with this alternative definition.¹³

The main results are presented in figure 4 by Current homeowner definition.

Homeowners and non-homeowners exhibit some stark differences in behavior, especially in the post-reform period. Specifically, homeowners exhibit a larger percentage drop of the transition probability into Current and a larger percentage rise of the transition probability into Insolvent post-reform. However, their transition into bankruptcy, while lower on average post reform, rises during the 2007-09 recession, when they experience a rise in insolvency. Additionally, homeowners experience a large rise in the transition into foreclosure, immediately after implementation of the reform. Specifically, the transition into Insolvent with foreclosure rises dramatically, and accounts, as can be seen in figure 5,¹⁴ for approximately 90% of the transitions into foreclosure post-reform.

Moving on to current non-homeowners, the main difference relative to home owners is that the probability transition into bankruptcy drops immediately after the reform and stays persistently lower, showing only a slight temporary increase due to the recession and then an immediate drop. Quantitatively, the transition into bankruptcy changes from pre-2004 level of 1.2% to 0.6%, a 50% decrease. At the same time, the transition probability into Current

¹²See Appendix B for more details.

¹³As shown in Appendix B, the differences in income for homeowners and non-homeowners are more pronounced for this definition of homeownership.

¹⁴Figure 19 in Appendix C presents results for Ever homeowners.

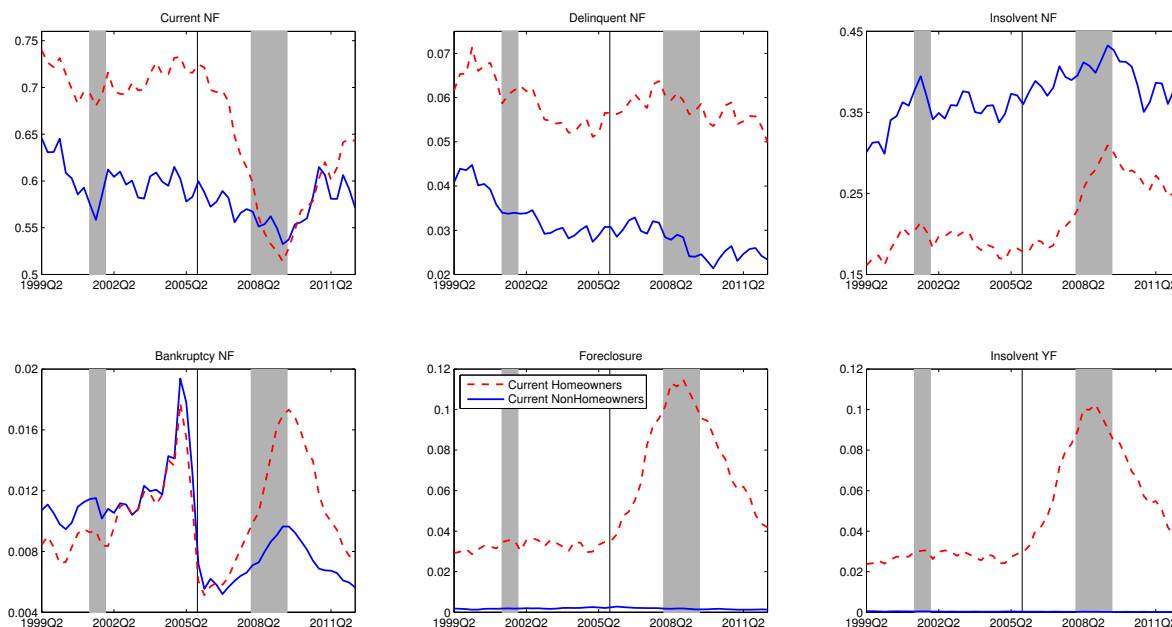


Figure 4: Four quarter ahead transition probability from Delinquent NB NF, by current home ownership status. All, 1% sample.

falls sharply and the the one into Insolvent rises, suggesting the non-filing individuals end up with severe delinquencies. This behavior is consistent with a bigger role of liquidity constraints for this group of households.¹⁵ Figure 18 in Appendix C presents results for the Ever definition of homeownership, and confirms the findings for the current homeownership definition.

To study the behavior of low income individuals by homeownership status, we examine the behavior of the 20% percentile of the credit score distribution of homeowners and non-homeowners according to our definition. Focussing on the transitions into Insolvent with foreclosure, in comparison with the full population of homeowners. As can be seen in figure 6, the lowest quintile of the credit score distribution has a foreclosure transition probability of approximately 7% pre-reform, while this probability is less than 2% for all current homeowners. For both groups, the probability rises sharply at the implementation of the reform. For the bottom quintile of the credit score distribution, the transition probability into insolvent with foreclosure rises to a peak of close to 18%, whereas this peak is approximately 10% for the overall population.

These findings suggest that the foreclosure crisis, especially for subprime borrowers, may

¹⁵Current non-homeowners can have foreclosures, but the transition probabilities into foreclosure states are essentially zero for this group.

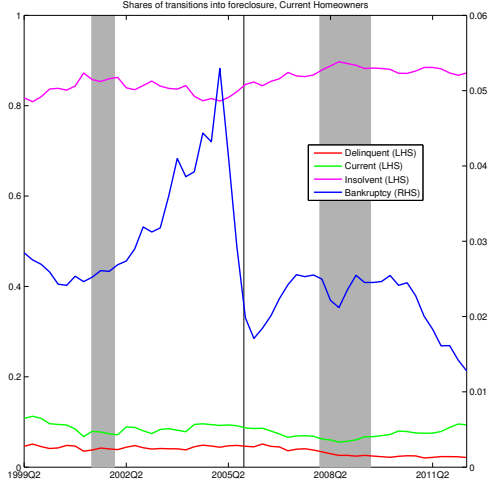


Figure 5: Four quarter ahead transition probability from Delinquent NB NF into foreclosure NB. Fraction of transitions into each sub-state. Current homeowners, 1% sample.

have been escalated by the bankruptcy reform in 2005.

3.2 Event Study Approach

To further understand the effect of the bankruptcy reform, we examine the behavior of individuals around a new episode of financial distress. We select individuals who show any type of insolvent account after at least 8 quarters of no insolvencies (however, they may have had delinquent accounts), and then we track the behavior of several outcomes of interest for 8 quarters before and after the new insolvency for each cohort of newly insolvent individuals in the sample period. Conditioning on a new insolvency refines the analysis we presented in the previous section, which focussed on individuals with delinquencies, as a stable 80% of newly insolvent households show a delinquency 1 quarter prior a new insolvency, as shown in table 1.

Table 1: Fraction of Newly Insolvents with Delinquency

6 qtrs before	4 qtrs before	2 qtrs before	1 qtr before	At new insolvency
9.5%	13.7%	24.9%	80.0%	32.9%

Figures correspond to 1999-2012 averages.

For each cohort of newly insolvent individuals, we document two robust patterns. First, at all horizons after a new insolvency, the bankruptcy rate drops for all cohorts after the

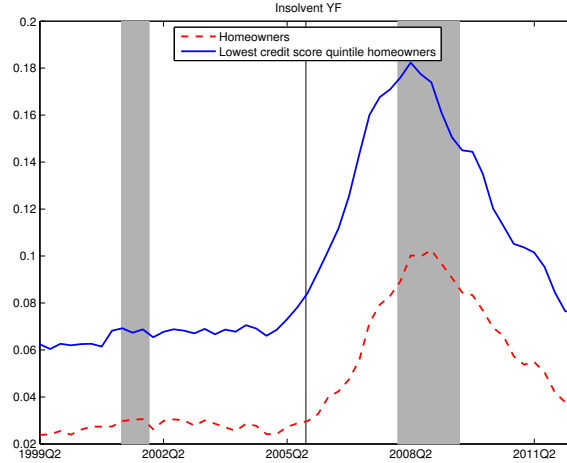


Figure 6: Four quarter ahead transition probability from Delinquent NB NF into Insolvent YF NB, by credit score quintile. Current homeowners, 1% sample.

introduction of BAPCPA. Specifically, figure 7 presents the fraction of households with a Chapter 7 bankruptcy at different horizons among the newly insolvent individuals. The dates on the horizontal axis denote the date of the new insolvency, *not calendar time*, so they indicate cohorts of newly insolvent individuals. For all cohorts showing a new insolvency after 2005Q3 (the vertical line corresponding to the date of the implementation of the law), the bankruptcy rate falls at all horizons, with a large discontinuity at the time of the implementation of the law.¹⁶

The second pattern we document is the very sizable increase in foreclosure rates of the newly insolvent individuals, with the rise starting at the implementation date of the new law, as with the drop in bankruptcy. Figure 8 presents the fraction of each newly insolvent cohort with a foreclosure flat at up to 8 quarters after new insolvency. After being stable during the first part of our sample at all horizons, the fraction of newly insolvent individuals with a foreclosure flag exhibits a change in slope at the implementation of the law, and then again during the housing crisis.

The evidence in this section uncovers a pattern of substitution from bankruptcy to foreclosure for newly insolvent individuals after BAPCPA, which suggests that the bankruptcy reform may have contributed to exacerbate the housing crisis. Since the analysis in this section is simply descriptive, we now turn to a regression approach which allows a more precise identification of the effects of the reform.

¹⁶The ‘after’ lines (like ‘5 after’) begin to fall before the implementation of the reform, as ‘5 after’ for cohort 2005Q1 is 2006Q2, after the law change.

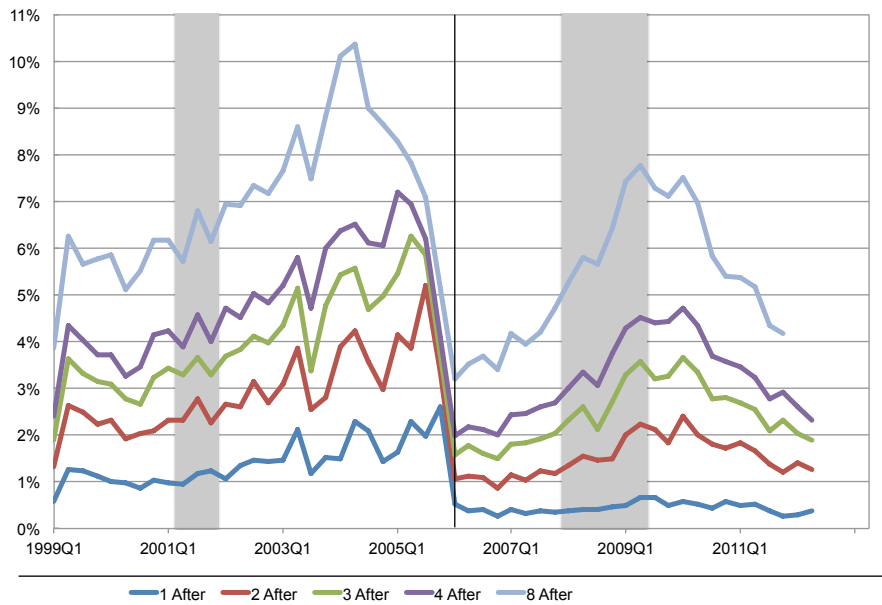


Figure 7: Fraction with Chapter 7 bankruptcy for Newly Insolvent households at different horizons. The vertical line corresponds to the date of implementation of the reform, and the shaded areas correspond to NBER recessions.

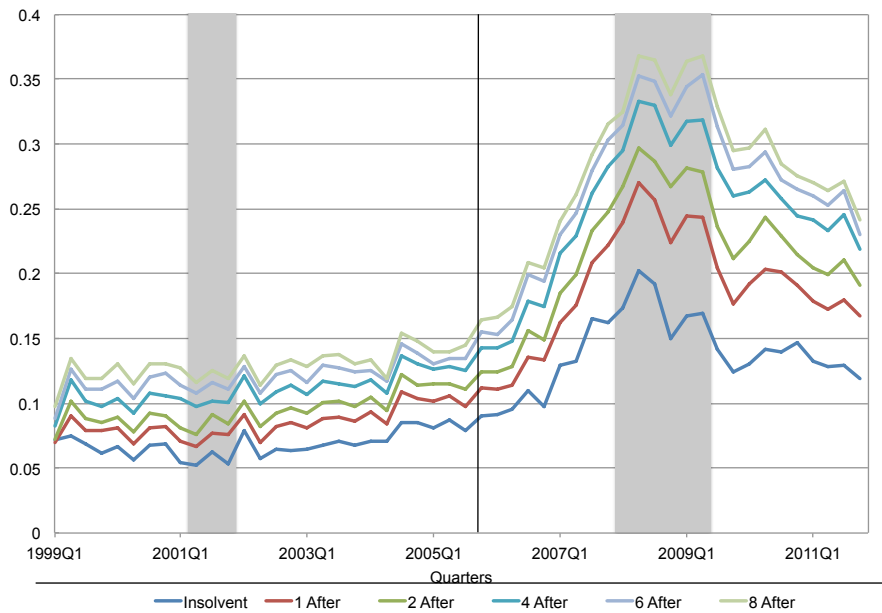


Figure 8: Fraction with foreclosure for Newly Insolvent households at different horizons. The vertical line corresponds to the date of implementation of the reform, and the shaded areas correspond to NBER recessions.

4 Analysis by District

The introduction of the BAPCPA and the resulting increase in the filing requirements resulted in a significant increase in the filing costs for households (attorney fees, filing fee and debtor education expenses). A major component of bankruptcy costs are attorney fees, which account for roughly 75% of total direct access costs (both pre- and post-reform). Based on a comprehensive study of filing fees, Lupica (2012) reports an average increase in attorney fees of 37% for Chapter 7 filers.¹⁷ Behind these average increases, there is significant district-level variation: for example, for Chapter 7 filers, the cost changes vary from an increase of 122% (Southern District of Georgia) to a drop of 28% (Southern District of Florida). In this section, we take attorney fees as a proxy for bankruptcy costs and exploit their variation across court districts in order to provide further evidence of the effects of the law on bankruptcy decisions, and specifically on the role of liquidity constraints in shaping the response to the reform.

We proxy the change in monetary costs associated with bankruptcy filing with the change in attorney fees for no asset cases, which account for around 90% of all bankruptcy filings. Table 2 presents descriptive statistics on the distribution of costs and cost changes. These costs exhibit a large cross-district variation both prior and after the bankruptcy reform. The prior range was \$356 (Tennessee Middle) to \$1920 (Florida Southern), while the post range is \$543 (Illinois Central) to \$1530 (Arizona). As argued in Lupica (2012), even controlling for state characteristics and filers' characteristics, BAPCPA had a significant effect on attorney fees changes across districts. The district average attorney fee pre-reform was \$700 and went up to \$1000 post-reform. Table 3 presents descriptive statistics for the bankruptcy rate by district, pre- and post-reform.

Table 2: Bankruptcy filing costs.

	Pre-reform	Post-reform	Log Difference
Mean	\$697	\$975	35%
90th percentile	\$907	\$1293	61%
75th percentile	\$786	\$1123	50%
Median	\$663	\$986	33%
25th percentile	\$589	\$810	22%
10th percentile	\$473	\$686	17%

¹⁷There is also a sizable rise in Chapter 13 filing costs. In this version of the paper, we focus on Chapter 7 bankruptcy.

Table 3: Quarterly bankruptcy rates: Filings.

	Pre-reform	Post-reform	Log Difference
Mean	1.80	1.14	-52%
90th percentile	2.77	1.94	-11%
75th percentile	2.19	1.48	-33%
Median	1.70	1.04	-52%
25th percentile	1.23	0.68	-71%
10th percentile	0.94	0.47	-85%

Table 4: Quarterly bankruptcy rates: Discharged bankruptcy.

	Pre-reform	Post-reform	Log Difference
Mean	1.74	1.16	-37%
90th percentile	2.96	2.00	1%
75th percentile	2.17	1.51	-19%
Median	1.53	1.03	-37%
25th percentile	1.04	0.68	-54%
10th percentile	0.68	0.46	-75%

Our analysis proceeds in two steps. We first repeat our transitions analysis, grouping districts by their cost change, and comparing estimated transitions across districts with high and low changes in attorney fees associated with the reform. The second step consists in running a difference-in-difference exercise to obtain a quantitative assessment of the effect of the reform on bankruptcy, insolvency and foreclosure, taking into account variation in other variables that potentially influence these outcomes, such as economic conditions at the district level, or regulatory characteristics at the state level.

4.1 Transitions by District

We use the attorney fees changes for Chapter 7 bankruptcy filings by court district, reported in Lupica (2012), and then group districts into top-30% ('high increase') and bottom-30% ('low increase') when ranked by filing cost percentage change.¹⁸ We then compute the

¹⁸We focus here on Chapter 7, which is the dominant chapter of choice for US households - roughly 70% of observed filings are Chapter 7 filings. This chapter is also more suitable for filers with low assets, which are more likely to be cash-strapped, increasing the potential impact of filing costs changes.

delinquency transition matrices, as in Section 3, separately for the high-increase and low-increase districts.

Our main findings are reported in figures 9 and 10. Here, the green line displays the average drop in transitions into a state from Delinquent NB NF at various horizons (in quarters, on the horizontal axis) for high cost districts, while the blue line reports this average for low cost districts.

Figure 9 reports the percentage change in the transitions into no foreclosure states. In both groups of court districts, just like in the overall economy, we see a large drop in the 4-quarter ahead bankruptcy rate with no foreclosure of households at all horizons, and as before, we find a corresponding increase in the transitions to Insolvent. These effects are sizably smaller in ‘low increase’ districts than in the ‘high increase’ districts, consistent with the notion that liquidity constraints are the mechanism through which the reform affects the transitions into bankruptcy and severe delinquency. For example, at the 2 quarter horizon, the bankruptcy rate drops by 40% of the pre-reform value for the ‘high increase’ districts and 32% in the ‘low increase’ districts.

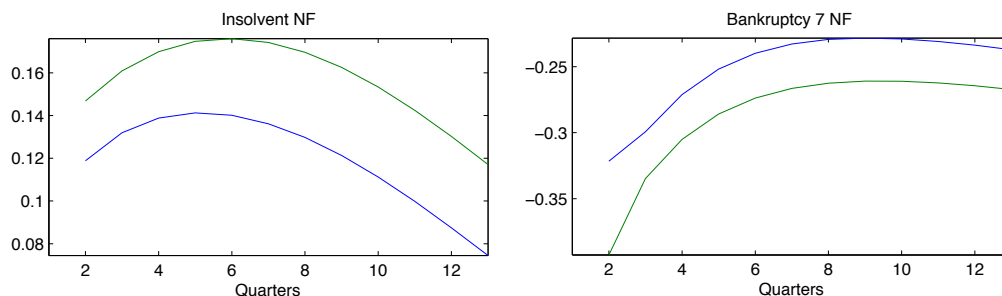


Figure 9: 1 to 12 quarter ahead transition probability from Delinquent NB NF, using average pre- and average post-reform transition probabilities. High (green) and low (blue) cost change districts. All, 1% sample.

Figure 10 reports change in the transitions into foreclosure states. In this case, we use the actual change, as pre-reform foreclosure rates were essentially zero. The transition rate into foreclosure from Delinquent NB NF rise, both into Insolvent and into Bankruptcy. However, the rise of the transition probability into Insolvent is the quantitatively dominant one, which provides additional evidence that there was a substitution into foreclosure as an alternative to bankruptcy after the reform.

Summarizing, the cross-district analysis confirms our hypothesis that the increase in filing costs has significant implications for household bankruptcy and delinquency behavior. Our findings are consistent with the notion that higher increase in costs prevents a larger

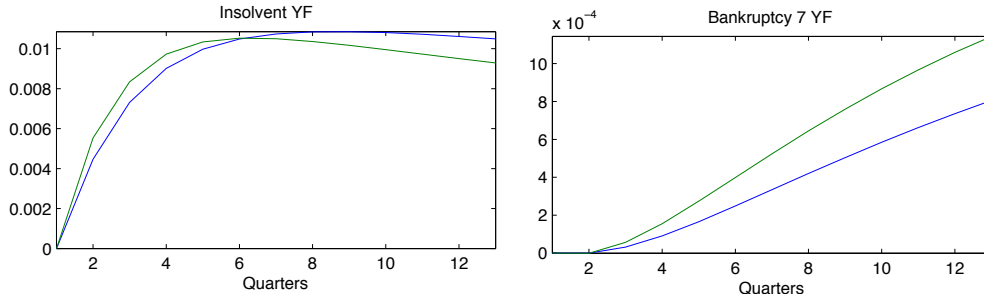


Figure 10: 1 to 12 quarter ahead transition probability from Delinquent NB NF, using average pre- and average post-reform transition probabilities. High (green) and low (blue) cost change districts. All, 1% sample.

fraction of households from filing for bankruptcy protection, pushing them into insolvency and foreclosure. Given evidence in Lupica (2012) that the cost increases are independent of business cycle or aggregate filing behavior, we view our findings as suggestive of direct effects of the law on these outcomes. In the next section, we provide further evidence by using a regression approach, where we control for business cycle and recession effects on the district level, and exploit the cross-district variation in filing cost.

4.2 Regression analysis

The purpose of this section is to assess the impact of liquidity constraints on bankruptcy filings. To this end, we exploit the sizable cross-district variation in the monetary costs associated with filing for bankruptcy as well as the cross-district variation in the change in these costs following BAPCPA. Using a difference-in-difference approach, we establish that districts with higher filing costs exhibited a larger decline in bankruptcy rates, controlling for other district characteristics and district business cycle effects.

We adopt the following difference-in-difference specification:

$$y_{it} = \alpha + \beta c_{i,t} + \psi I_t^{post} + \phi X_{it} + \epsilon_{it}, \quad (1)$$

where y_{it} is the log of the outcome of interest, c_i the log of the bankruptcy filing cost, and X_{it} is a vector of district level controls, with i denoting districts and t quarters.

Our main variable of interest is the bankruptcy rate at the district level. The coefficient β captures the effect of the percentage change in the cost post-reform on the log of the bankruptcy rate post-reform. To see this, we take the first difference, which corresponds to

time:

$$y_{it'} - y_{it} = \psi + \beta \Delta c_i + \phi(X_{it'} - X_{it}), \quad (2)$$

where t and t' denotes quarter pre-and post reform, and Δc_i is the log change in the filing cost associated with the reform. Then, we take a second difference across districts:

$$\Delta y_{it} - \Delta y_{jt} = \beta(\Delta c_i - \Delta c_j) + \phi(\Delta X_{it} - \Delta X_{jt}), \quad (3)$$

where Δx_{it} denotes the change over time of a variable x in district i .

The bankruptcy court in each district determines the reasonable fee (our measure of the filing cost) for each chapter of bankruptcy. While lawyers can in principle deviate from that guidance, few do in reality (Lupica (2012)). Hence, while the amount of extra work associated with the new reform may be similar across districts (because the law is federal), the amount of extra fee a lawyer can charge for the extra work burden can vary across court districts due to different determination as to the reasonable amount of the increase in each bankruptcy court.

One concern with uses the filing fees as explanatory variables is that the change in fees associated with the reform may be jointly endogenous with the bankruptcy rate or its change. To address this concern we instrument the change in fees. We posit that the change in fees associated with the reform is driven by the political affiliation of the bankruptcy judges in office in each district at the time of the implementation of reform. Bankruptcy judges are appointed by the Court of Appeals, in the Circuit to which each district belongs, to renewable 14 year terms. Therefore, we assume that the political affiliation of the bankruptcy judges will reflect the affiliation of the magistrates on the Court of Appeals at the year of first appointment of each bankruptcy judge. Magistrates on appellate courts also serve renewable 14 year terms and are appointed by the President. We therefore proxy the political affiliation of each magistrate present on the Court of Appeals in the year of first appointment of each bankruptcy judge with the party of the President who appointed that magistrate. We then aggregate the preferences across sitting appellate magistrates to come up with a unique measure, corresponding to the fraction of magistrates appointed by Republican presidents, which we attribute to the bankruptcy judge who was appointed by that court.

Each court district has several bankruptcy judges. To obtain a measure of political affiliation at the district level, we compute the weighted average of the political affiliation of the bankruptcy judges in the district, with weights given by their tenure in the bankruptcy court.¹⁹

¹⁹We also experiment with unweighted averages. The results we will present are not sensitive to the

Since a President’s opportunity to appoint appellate magistrates depends on the schedule of retirements and deaths on each appellate court, it is therefore arguably exogenous to the effects of the 2005 bankruptcy reform. Moreover, it is well documented that bankruptcy courts actively change recommended lawyer fees to influence filing patterns (see Dobbie and Song (2014)). Likely, they are driven by a number of idiosyncratic reasons or local legal culture. However, we expect that the political preferences of the bankruptcy judges comprised in each court would matter in shaping their recommendation for reasonable lawyer fees, given that they understand that the structure of those fees affects filing patterns. Therefore, our instrument is both plausibly exogenous and economically salient.

Since our instrument is designed to proxy the change in costs, not the levels, we need to adapt our baseline specification. Note that 1 can be rewritten as:

$$y_{it} = \alpha + \beta c_{i,pre} + \gamma \Delta c_i \times I_t^{post} + \psi I_t^{post} + \phi X_{it} + \epsilon_{it}, \quad (4)$$

where equation 4 is equivalent to 1 if $\beta = \gamma$.

We find that our instrument is correlated with the cost level pre-reform.²⁰ So, to implement the specification in 4, we estimate the following equation:

$$y_{it} = D_i + \gamma \Delta c_i \times I_t^{post} + \psi I_t^{post} + \phi X_{it} + \epsilon_{it}, \quad (5)$$

where D_i is a district fixed effect.

The specification in equation (5) is a relaxed version of the one in (4), since the former forces the district effects to be proportional to the log level of the filing cost pre-reform, while the latter does not impose this restriction. This implies that the specification in (5) potentially captures additional fixed factors at the district level which are not related to the pre-reform filing costs.

We consider the bankruptcy rate, measured by filing rate (table 5) and the discharge rate (table 6). The filing rate measures the fraction of individuals who file for Chapter 7 bankruptcy in a given quarter, while the discharge rate measures the fraction of individuals who obtain a bankruptcy discharge in that quarter. Since most Chapter 7 filings are discharged within the following quarter, the results for both measures are very similar.

We report results from a baseline specification which includes economic controls and state level regulatory controls. The economic controls include personal income, the unemployment rate, house price index. The state level regulatory controls include the wage garnishment aggregation scheme.

²⁰The correlation 0.06 significant at the 1% level.

limit, the homestead exemption level and indicators for judicial foreclosure states and for recourse states. These are intended capture the impact of state level regulation on the incentives to go bankrupt. For example, in a state with higher wage garnishment limit, delaying bankruptcy is more costly. Conversely, higher homestead exemptions may render bankruptcy more attractive for home owners. Since these variables are time invariant, we drop district fixed effects for this specification. In addition, we also report a specification which replaces these controls with time effects.

Table 5: Evidence on the effects of the reform: Bankruptcy filings.

	(1)	(2)	(3)
Specification	Baseline	IV	IV
Filing Cost	-0.54 (3.55)		
Reform Dummy	-0.50 (6.43)	-0.03 (0.14)	-0.30 (1.35)
Filing Cost Change		-1.84 (2.62)	-1.39 (2.32)
Income	0.33 (1.50)	-0.33 (2.84)	
Unemployment rate	0.35 (3.01)	0.85 (15.62)	
Δ Unemployment rate	0.09 (1.52)	-0.12 (2.77)	
House Price Index	-0.75 (4.61)	-0.40 (3.66)	
Δ HPI	-0.63 (4.02)	-0.51 (3.82)	
State-level regulation	Yes	No	No
District effects	No	Yes	Yes
Time effects	No	No	Yes
N	1993	1991	2191

Absolute values of the t-statistics are reported in parentheses. Specifications (1) uses clustered standard errors at the district level, and reports the adjusted R^2 . Specifications (2)-(3) use robust standard errors, and report centered R^2 . The F statistic for the weak instrument test for specification (2) is 29 and for specification (3) it is 32. We drop all districts for which the average number of bankruptcies per quarter is below 5.

The increase of the filing cost post-reform is strongly negatively related to the bankruptcy filing rate, for all specifications. The interpretation of these estimates is as follows. For specification 1, moving from the first to the 10th decile of the cost change distribution (+44 percentage points) increases the drop in bankruptcy filings by 24 percentage points. For specification 2, moving from the 10th to the 90th percentile of the projected cost change distribution, increases the drop in the bankruptcy rate by 11 percentage points, while for specification 3 it increases the drop in bankruptcy filings by 8.4 percentage points.²¹ Ad-

²¹We compute the projected cost change from the first stage regression evaluating all regressors other than

ditionally, the bankruptcy rate is positively related to district level unemployment, and negatively related to the home price index for all specifications.

Table 6: Evidence on the effects of the reform: Bankruptcy discharge.

	(1)	(2)	(3)
Specification	Baseline	IV	IV
Filing Cost	-0.58 (3.75)		
Reform Dummy	-0.44 (4.14)	0.52 (1.20)	0.85 (2.52)
Filing Cost Change		-3.68 (3.05)	-2.83 (3.05)
Income	0.39 (1.72)	0.35 (1.81)	
Unemployment rate	0.37 (3.28)	0.87 (9.19)	
Δ Unemployment rate	-0.17 (2.30)	-0.35 (4.55)	
House Price Index	-0.72 (4.41)	0.04 (0.19)	
Δ HPI	-0.75 (3.42)	-0.76 (3.35)	
State-level regulation	Yes	No	No
District effects	No	Yes	Yes
Time effects	No	No	Yes
N	1988	1991	2191

Absolute values of the t-statistics are reported in parentheses. Specifications (1) uses clustered standard errors at the district level, and reports the adjusted R^2 . Specifications (2)-(3) use robust standard errors, and report centered R^2 . The F statistic for the weak instrument test for specifications (2) is 29 and for specification (3) it is 32. We drop all districts for which the average number of bankruptcies per quarter is below 5.

4.3 Substitution from Bankruptcy

In Section 3, we showed that the reduction in bankruptcy filings and discharges associated with the reform was accompanied by a sizable rise in insolvency and foreclosure. In this section, we explore this substitution effect with regression analysis. This allows us to control for district-specific and overall economic conditions to isolate the impact of the reform.

To this end, we focus on the population of *newly insolvent* individuals—individuals who show a first insolvency of any kind after no insolvencies (and no bankruptcy or foreclosure flags) for the previous 8 quarters. For this sub-population, we compute the rate at which individuals in each quarter transition into various states at a 4 and 8 quarter horizons. The states we are interested in are insolvency, bankruptcy and foreclosure. These transitions

the instrument at their unconditional mean.

are intended to capture the flow into various states for a new spell of financial distress, and therefore they differ from the transition rates estimated in Section 3, which are unconditional.

The drop in bankruptcy documented in Section 4.2 driven by cost changes is also present for the subpopulation of newly insolvent individuals, and quantitatively much stronger. Table 7 shows estimates of our instrumental variables equation (5) for this subpopulation, in which the dependent variable is the transition from new insolvency to Chapter 7 bankruptcy filing or discharge, at 4 or 8 horizons. Our estimates imply that moving from the 10th to the 90th percentile of the theoretical cost distribution²² increases the drop in the transition from insolvency to bankruptcy by 19 percentage points at the 4 quarter horizon and 12.5 percentage points at the 8 quarter horizon. To put these numbers in perspective, the mean drop of transition from insolvency to bankruptcy is 53% at the 4 quarter horizon and 49% at the 8 quarter horizon.

Table 7: Effects of the reform: Transitions from insolvency to bankruptcy filing.

Horizon	4Q	8Q
Filing Cost Change	-3.07 (2.88)	-2.07 (2.22)
Reform Dummy	0.54 (1.42)	0.22 (0.67)
Income	-1.11 (5.71)	-0.89 (4.01)
Unemployment rate	0.75 (9.13)	0.63 (8.29)
Δ Unemployment rate	-0.01 (0.20)	0.10 (1.57)
House Price Index	0.36 (2.20)	0.14 (0.97)
Δ HPI	-0.64 (3.33)	-0.49 (2.73)
District effects	Yes	Yes
N	1873	1751

These regressions all correspond to specification 5. Absolute values of the t-statistics are reported in parentheses. All specifications use robust standard errors. We report the centered R^2 . For all specifications the F statistic for the weak instrument test is above 29. We drop all districts for which the average number of bankruptcies per quarter is below 5.

Of course, the decreased transition to bankruptcy must be accompanied by increases in transitions into other possible outcomes—the question is which ones. Below, we document the substitution pattern and show that the outcomes which exhibit increased inflows related to drops in flows to bankruptcy are insolvency (the persistence of insolvency) and foreclosures. In particular, we find no effect on transitioning into ‘current’.

In the analysis below, we aim to capture the effect of within-district persistent drop in flows to bankruptcy on flows to other credit states. To that end, we adopt a two step

²²Predicted by the instrument only, holding controls at their unconditional mean levels.

procedure. We first obtain the average changes in flows to insolvency, foreclosure and current states, driven by the reform, controlling for economic factors. Formally, we estimate:

$$y_{it} = \sum_i \gamma_i I_{it}^{post} + \phi X_{it} + I_t + D_i, \quad (6)$$

where I_{it}^{post} is a set of district-specific post-reform dummies, D_i are district effects, I_t are time-effects, and X_{it} is a vector of district-level economic controls. X_{it} includes logs of income, unemployment rate and house price index, as well as 4-quarter changes in log house price index and the log unemployment rate. The output of interest from this step is the set of district dummies γ_i , which capture the log change in average flows not explained by our other controls.

In the second step of our estimation procedure, we regress the district dummies $\{\gamma_i\}$ estimated in the first stage on the district-specific log change in the average flow from insolvency to Chapter 7 bankruptcy:

$$\gamma_i = \alpha + \beta \Delta F_{ins \rightarrow bank}.$$

The estimated coefficient β will capture the direction and statistical strength of the relation between the drop in flows to bankruptcy and the other flows of interest.

We report the estimates for flows into insolvency (persistence of insolvency), into foreclosure and into current in table 8. At the 4 quarter horizon, the median bankruptcy flow drop (56%) increases the persistence of the insolvency state by 3% (the median change is 1.3%). Shifting from the 10th to the 90th percentile of the bankruptcy flow distribution (60 percentage point drop) results in an change of the increase of the persistence of the insolvency state by an additional 3.2%. For the flows into foreclosure, the results are much more dramatic. At the 4-quarter horizon, the median drop in flows into bankruptcy results in a 27% percent increase in flows into foreclosure (relative to a median increase of these flows of 78%). There is no evidence that the law had any effect on transitions to current—which suggests lack of a ‘disciplining’ effect of the law in which people discouraged from filing pay off their debts.

Substitution for initial state Current We also provide evidence on the flows conditional on individuals being initially Current: on time on all accounts and no bankruptcy or foreclosure for the past 8 quarters. The transition of interest is the persistence of the Current state, which gives some indication of whether the reform served as any kind of de-

Table 8: Evidence on the effects of the reform: Substitution from Bankruptcy.

Horizon	4Q	8Q
Flow to Insolvency		
Flow to Bankruptcy	-0.05 (1.94)	-0.08 (2.21)
R^2	0.05	0.07
Flow to Foreclosure		
Flow to Bankruptcy	-0.49 (2.05)	-0.37 (1.87)
R^2	0.06	0.05
Flow to Current		
Flow to Bankruptcy	0.03 (0.61)	-0.004 (0.12)
R^2	n.a.	n.a.

Horizon denotes the horizon of the outcome variable—flows to bankruptcy are kept at the 4 quarter horizon.

terrent to delinquent behavior.²³ Table 9 reports the analog of the analysis in the previous paragraph for this initial state. We find that indeed in districts which exhibited larger drops in transitions to bankruptcy, the persistence of the Current state went up. Quantitatively, for the median drop in flows into bankruptcy, the persistence of the Current state increased by 0.65% percent at the 4 quarter horizon and 1.5% percent at the 8 quarter horizon.

Table 9: Evidence on the effects of the reform: Substitution from Bankruptcy.

Horizon	4Q	8Q
Current to Current		
Flow to Bankruptcy	-0.009 (3.97)	-0.021 (4.86)
R^2	0.23	0.32

Horizon denotes the horizon of the outcome variable—flows to bankruptcy are kept at the 4 quarter horizon.

²³The estimated effects of the reform on the transitions to bankruptcy, analogous to the ones in table 7 imply a quantitative change in the flow to bankruptcy similar in magnitude to the overall effects in table 5 (not reported here).

5 Bankruptcy versus Insolvency: Does It Matter?

Our transitions and regression analyses show a sizable substitution from bankruptcy to insolvency, with and without foreclosure, and a rise of the persistence of insolvency. We now examine which of these states is more beneficial to individuals. We focus on Ch. 7 bankruptcy, therefore, the tradeoff is having a bankruptcy flag on one's credit record without any delinquent or insolvent debt,²⁴ versus no bankruptcy flag with an accumulation of delinquent and insolvent balances, with possibly additional denigratory items.

We adopt an event study approach, and, in each quarter, we examine two groups of individuals: (i) those who show a new insolvency on any type of debt after 8 quarters without insolvency (Newly Insolvent) or (ii) individuals who experience a new Chapter 7 bankruptcy (Bankrupt). Among the Newly Insolvent, we further distinguish between individuals who do not file for bankruptcy in the 8 quarters after the new insolvency (Non-Bankrupts), and those who do (Future Bankrupts).

As shown in Section 3.2, figure 7, there is large drop in the fraction of newly insolvent that become bankrupt within 8 quarters, after the reform, consistent with the overall decline in bankruptcy filings documented in the previous sections. We compare several measures of financial distress and credit access across the Future Bankrupts and the Non-Bankrupts.

We consider two measures of financial distress, the level of balances in collection and the fraction of newly insolvents who display court judgements on their credit file. Balances in collections typically arise due to charged off unsecured debt, especially credit card debt, installment debt and medical debt. Court judgements can be on file for unpaid alimony, wage garnishment orders or other unpaid debt, such as medical bills. Bankruptcy filing provides immediate relief from all collection efforts and stays all court judgements. Therefore, we report the behavior of these two variables only for the newly insolvent who do not go bankrupt in the following 8 quarters.

Figure 11 plots the average balances in collections, conditional on having non-zero balances, for newly insolvent individuals who will not go bankrupt in the next 8 quarters, at different horizons. Approximately 55% of households have items in collection when they become newly insolvent. This fraction grows by 40% after 8 quarters, as long as they don't file for bankruptcy, and both fractions are stable over time. There is a positive trend in the value of dollar balances in collection at a new insolvency, and these balances more than double 6 quarters after the new insolvency, with this growth somewhat greater for individuals who become insolvent during the 2007-2009 recession and subsequent recovery.

²⁴Student debt is not dischargeable in bankruptcy, and is excluded from the analysis.

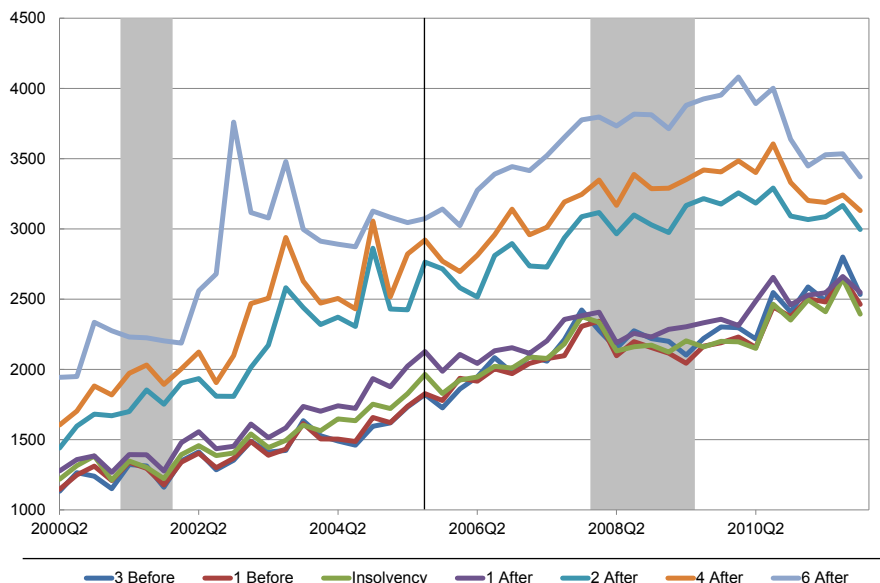


Figure 11: Average balances in collections for Newly Insolvent individuals without bankruptcy in the next 8 quarters.

Figure 12 shows the fraction of newly insolvent individuals that do not go bankrupt in the next 8 quarters, who have at least one court judgement. We display the ratio of this variable to its value at the time of the new insolvency for several horizons after that insolvency. The fraction of individuals who have judgements at the time of a new insolvency is on average 7% in the sample, and is stable over time. This fraction grows gradually by 60% by 8 quarters after the new insolvency pre- reform, and almost doubles after 8 quarters post-reform. The difference in the rate of accumulation of judgements for the newly insolvent pre- and post-reform is consistent with positive selection into bankruptcy post-reform relative to pre-reform, reaffirming the notion of binding liquidity constraints.

We now consider the differences in access to credit between individuals who become newly insolvent in a given quarter without bankruptcy in the next 8 quarters, and individuals who go bankrupt in that quarter. Figure 13 displays the fraction of individuals with at least one new unsecured line of credit opened in the last year, four quarters after the new insolvency or bankruptcy. We interpret this as a measure of credit supply. In figure 14 we report the fraction of individuals with inquiries among these groups, also 4 quarters after insolvency or bankruptcy, an indicator of credit demand.

Clearly, bankrupt households have are more successful opening new unsecured lines of credit, even if, until 2009, they submit inquiries at a similar rate as individuals who will not go bankrupt. Even with the considerable time variation in both series, the percentage

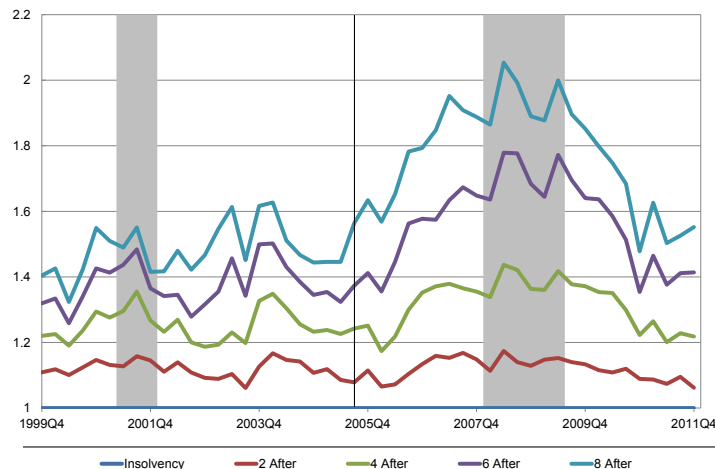


Figure 12: Fraction of Newly Insolvent without bankruptcy in the next 8 quarters with at least one judgement. Normalized to 1 at time of new insolvency.

difference in the fraction with new lines of credit between bankrupts and newly insolvent who do not go bankrupt is roughly stationary 19% .²⁵

We conclude by describing the behavior of credit scores. Figure 15 compares credit scores for the newly insolvents conditional on whether they go bankrupt in the next 8 quarters. At insolvency, those who will go bankrupt display a lower credit score, which suggests that they are negatively selected. Four quarters after the new insolvency, this ranking still prevails, even if credit scores have increased for both groups.

Figure 16 compares credit scores for the individuals who become newly insolvent in a given quarter who do not go bankrupt in the next 8 quarters, and individuals who go bankrupt in that quarter. Both one and four quarters after bankruptcy, the credit scores of the individuals who go bankrupt are considerably higher than those of the newly insolvent who do not go bankrupt. Moreover, this difference grows after the implementation of the reform, suggesting positive selection of bankrupt individuals in the post-reform period compared to bankrupt individuals in the pre-reform period. This change in the difference in credit score across bankrupt individuals and newly insolvent who will no go bankrupt is consistent with binding liquidity constraints prevent the newly insolvents from filing for bankruptcy.

²⁵The discontinuity in behavior may be due to the Credit Card Accountability Responsibility and Disclosure Act of 2009, which introduced improved standards of transparency and accountability for credit cards companies.



Figure 13: Fraction of Newly Insolvent without bankruptcy in the next 8 quarters and fraction of Bankrupts who opened at least one new unsecured line within the prior year.

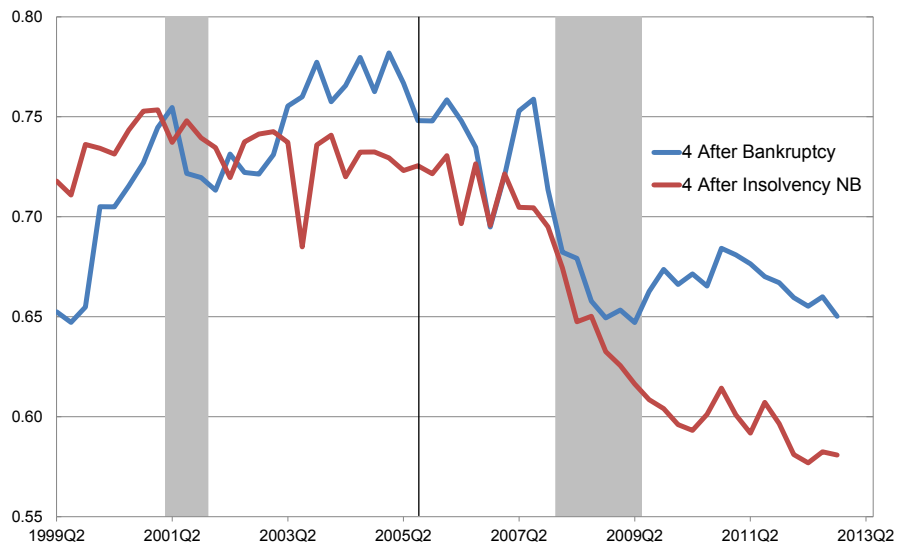


Figure 14: Fraction of Newly Insolvent without bankruptcy in the next 8 quarters and fraction of Bankrupts with at least one inquiry.

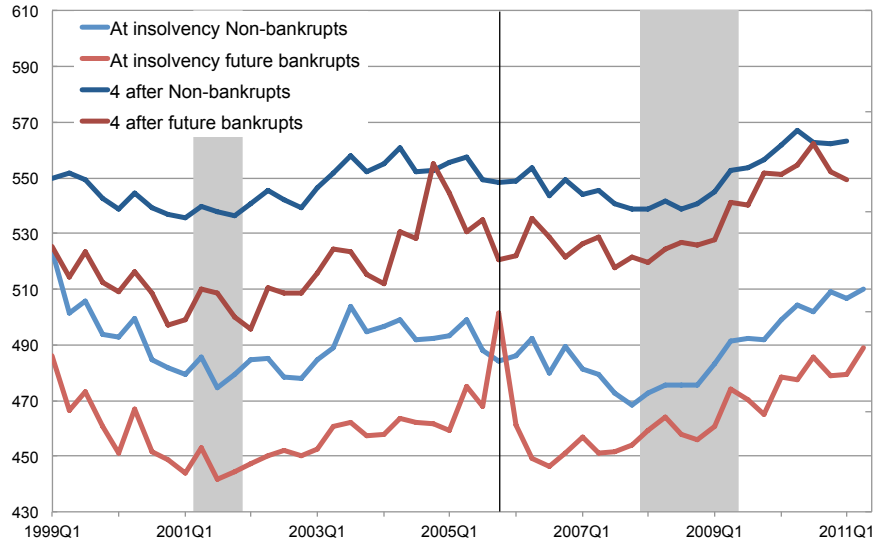


Figure 15: Credit scores of newly insolvent by future bankruptcy status, at various horizons.

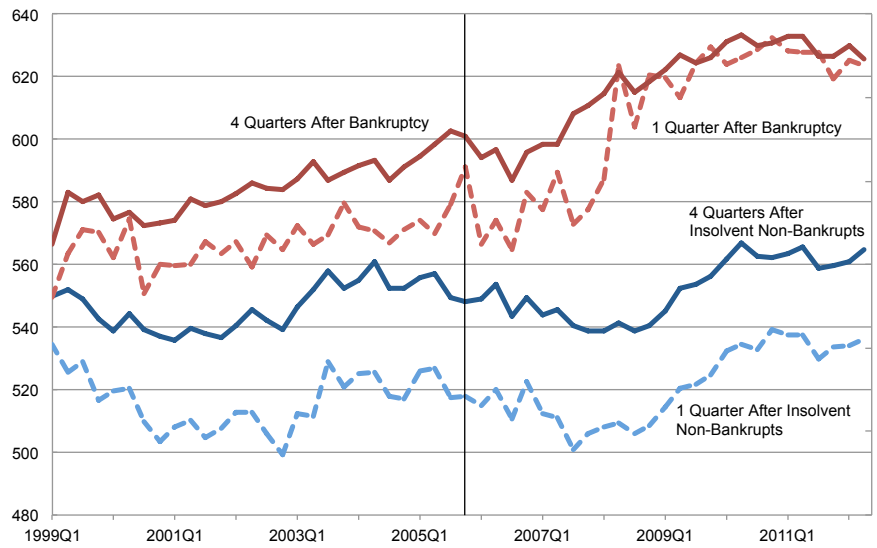


Figure 16: Credit score for newly insolvent without bankruptcy in the following 8 quarters and for bankrupts, at various horizons.

6 Conclusions

Our analysis suggests that the 2005 bankruptcy reform caused a decline in bankruptcy filings, which were replaced by a sizable rise in insolvency and foreclosure. We show that insolvency is a state associated with a high degree of financial distress in comparison to bankruptcy. This consequence of BAPCPA is potentially welfare reducing for households. However, since the recovery rates for creditors from insolvent loans are higher than on bankrupt loans, this could have induced banks and credit card companies to expand access and improve conditions for personal loans. Indeed, Simkovic (2009) finds that BAPCPA reduced credit card company losses and increased their profits. However, there is little evidence that credit conditions for consumers improved. Taken together, these findings suggest the main effect of the 2005 bankruptcy reform was to shift financially stressed individuals from bankruptcy to insolvency.

References

- Athreya, Kartik B. 2002. “Welfare implications of the bankruptcy reform act of 1999.” *Journal of Monetary Economics* 49 (8): 1567–1595.
- Dobbie, Will, and Jae Song. 2014. “Debt Relief And Debtor Outcomes: Measuring The Effects Of Consumer Bankruptcy Protection.” *American Economic Review*.
- Domowitz, Ian, and Thomas L Eovaldi. 1993. “The Impact of the Bankruptcy Reform Act of 1978 on Consumer Bankruptcy.” *Journal of Law & Economics* 36:803.
- Domowitz, Ian, and Robert L Sartain. 1999. “Determinants of the consumer bankruptcy decision.” *The Journal of Finance* 54 (1): 403–420.
- Fay, Scott, Erik Hurst, and Michelle J White. 2002. “The household bankruptcy decision.” *American Economic Review* 92 (3): 706–718.
- Gross, David B, and Nicholas S Souleles. 2002. “An empirical analysis of personal bankruptcy and delinquency.” *Review of Financial Studies* 15 (1): 319–347.
- Gross, Tal, Matthew J Notowidigdo, and Jialan Wang. 2012. “Liquidity constraints and consumer bankruptcy: Evidence from tax rebates.” *Review of Economics and Statistics*, no. 00.
- Jones, Yvonne D. 2008. *Bankruptcy Reform: Dollar Costs Associated with the Bankruptcy Abuse Prevention and Consumer Protection Act Of 2005*. DIANE Publishing.
- Lawless, Robert M., Angela K. Littwin, Katherine Porter, John Pottow, Deborah Thorne, and Elizabeth Warren. 2008. “Did bankruptcy reform fail? An empirical study of consumer debtors.” *American Bankruptcy Law Journal* 82:349–406.
- Lee, Donghoon, and Wilbert van der Klaauw. 2010. “An Introduction to the FRBNY Consumer Credit Panel.” FRBNY Staff Report 479.
- Livshits, Igor, James MacGee, and Michele Tertilt. 2007. “Consumer bankruptcy: A fresh start.” *The American Economic Review* 97 (1): 402–418.
- . 2010. “Accounting for the Rise in Consumer Bankruptcies.” *American Economic Journal: Macroeconomics* 2 (2): 165–193.
- Lupica, Lois R. 2010. “The Costs of BAPCPA: Report of the Pilot Study of Consumer Bankruptcy Cases.” *American Bankruptcy Institute Law Review* 18:43–87.
- . 2012. “The Consumer Bankruptcy Fee Study: Final Report.” *Am. Bankr. Inst. L. Rev.* 20:17–759.

Mann, Ronald J, and Katherine Porter. 2009. "Saving up for Bankruptcy." *Geo. LJ* 98:289.

White, Michelle J. 2007. "Bankruptcy reform and credit cards." NBER Working Paper 13265.

A Consumer Credit Panel Data and Variables

Transition Matrices

Our transition matrices include 14 possible states: seven debt states for individuals who are not in foreclosure, and seven debt states for individuals who are in foreclosure. We define the seven debt states and foreclosure as follows:

1. **Delinquent:** An individual is delinquent if they have at least one loan in their CCP report in that quarter that is 30, 60, or 90 days past due (crtr_attr13, crtr_attr14, or crtr_attr15), while not having any loans that are 120+ days past due, severely derogatory, or bankrupt (crtr_attr16, crtr_attr17, or crtr_attr18). Also, at least one of crtr_attr16, crtr_attr17, or crtr_attr18 must be non-missing, and the individual must not be in a state of bankruptcy.

2. **Insolvent:** An individual is insolvent if they have at least one loan in their CCP report in that quarter that is 120+ days past due, severely derogatory, or bankrupt (crtr_attr16, crtr_attr17, or crtr_attr18), while not having any loans that are 30, 60, or 90 days past due (crtr_attr13, crtr_attr14, or crtr_attr15). Also, at least one of crtr_attr13, crtr_attr14, or crtr_attr15 must be non-missing, and the individual must not be in a state of bankruptcy.

3. **Both:** An individual is both delinquent and insolvent if they both have at least one loan in their CCP report in that quarter that is 30, 60, or 90 days past due (crtr_attr13, crtr_attr14, or crtr_attr15) and have at least one loan in their CCP report in that quarter that is 120+ days past due, severely derogatory, or bankrupt (crtr_attr16, crtr_attr17, or crtr_attr18). Also, at least one of crtr_attr13, crtr_attr14, or crtr_attr15 and one of crtr_attr16, crtr_attr17, or crtr_attr18 must be non-missing, and the individual must not be in a state of bankruptcy.

4. **Neither:** An individual is neither delinquent nor insolvent if they have no loans that are 30, 60, 90 or 120+ days past due, severely derogatory, or bankrupt (crtr_attr13, crtr_attr14, crtr_attr15, crtr_attr16, crtr_attr17, or crtr_attr18). Also, at least one of crtr_attr13, crtr_attr14, or crtr_attr15 and one of crtr_attr16, crtr_attr17, or crtr_attr18 must be non-missing, and the individual must not be in a state of bankruptcy.

5. **Missing:** An individual's debt status is missing if the number of loans in their CCP report in that quarter that are 30, 60, or 90 days past due (crtr_attr13, crtr_attr14, or crtr_attr15) are all not reported, or the number of loans that are 120+ days past due, severely derogatory, or bankrupt (crtr_attr16, crtr_attr17, or crtr_attr18) are all not reported. Non-reporting occurs when Equifax does not receive enough information from the respective financial institutions to generate its credit trend variables.

6. **Chapter 7 Bankruptcy:** There are two scenarios in which an individual is identified as being in the state of Chapter 7 bankruptcy. First, if the individual experiences Chapter 7 bankruptcy commencement (see below), then that individual is marked as being in a state of Chapter 7 bankruptcy for ten years after the date of their foreclosure. Second, if the individual enters the dataset for the first time marked with the bankruptcy flag (cust_attr290)

coded "Chapter 7 discharged" (which almost exclusively occurs at the datasets 1999 Q1 truncation), that individual is marked as being in the state of Chapter7 bankruptcy until the flag (which is supposed to stay on for ten years after the bankruptcy's commencement) turns off. We define the commencement of Chapter 7 bankruptcy as the following pattern in `cust_attr290`: the individual is marked as Chapter 7 discharged in the present quarter, Chapter 7 voluntary or Chapter 7 involuntary in the most recent past quarter, and Chapter 7 discharged in the next quarter.

7. Chapter 13 Bankruptcy: There are two scenarios in which an individual is identified as being in the state of Chapter 13 bankruptcy. First, if the individual experiences Chapter 13 bankruptcy commencement (see below), then that individual is marked as being in a state of Chapter 13 bankruptcy for ten years after the date of their foreclosure. Second, if the individual enters the dataset for the first time marked with the bankruptcy flag (`cust_attr291`) coded "Chapter 13 discharged" (which almost exclusively occurs at the datasets 1999 Q1 truncation), that individual is marked as being in the state of Chapter13 bankruptcy until the flag turns off. We define the commencement of Chapter 13 bankruptcy as the following pattern in `cust_attr291`: the individual is marked as Chapter 13 discharged in the present quarter, Chapter 13 filed in the most recent past quarter, and chapter 13 discharged in the next quarter.

- Foreclosure: There are two scenarios in which an individual is marked as being in the state of foreclosure. First, if the individual forecloses on a home (that is, if `cma_attr3905` switches from off ("0") to on ("1" or "7")), then that individual is marked as being in a state of foreclosure for seven years after the date of their foreclosure. Second, if the individual enters the dataset for the first time while under foreclosure (which almost exclusively occurs at the datasets 1999 Q1 truncation), that individual is marked as being in the state of foreclosure until the flag (which is supposed to stay on for seven years after the date of the foreclosure) turns off.

We condition transition matrices on credit score quintile using the CCP Equifax risk score, which is similar to the FICO score, in that both model 24 month default risk as a function of credit report measures (see Lee and van der Klaauw (2010)). It varies between 280 and 840 and represents an assessment of the individuals credit-worthiness. We also condition transition matrices using four different definitions of homeownership:

- Less-Restrictive Current Homeownership: The individual has at least one home-secured loan in the given quarter (using `crtr_attr6`, `crtr_attr7`, and `crtr_attr8`).

- More-Restrictive Current Homeownership: The individual has at least one mortgage loan in the given quarter (using `crtr_attr6`).

- Less-Restrictive Overall Homeownership: The individual has at least one home-secured loan at any time between 1999 and 2013 in the CCP dataset (using `crtr_attr6`, `crtr_attr7`, and `crtr_attr8`).

- More-Restrictive Overall Homeownership: The individual has at least one mortgage loan at any time between 1999 and 2013 in the CCP dataset (using `crtr_attr6`).

Regressions

Our regression analysis models three variables of interest:

1. Bankruptcy Rate: The fraction of CCP-covered individuals who commence Chapter 7 bankruptcy, by judicial district and quarter. We define the commencement of Chapter 7 bankruptcy as the following pattern in `cust_attr290`: the individual is marked as Chapter 7 discharged in the present quarter, Chapter 7 voluntary or Chapter 7 involuntary in the most recent past quarter, and Chapter 7 discharged in the next quarter. We exclude districts in which the average number of bankruptcies per quarter in the CCP is fewer than 5.

2. Foreclosure Rate: The fraction of CCP-covered individuals who enter the state of foreclosure, by judicial district and quarter. We define the state of foreclosure as a quarter in which the indicator `cma_attr3905` is on ("1" or "7").

3. Insolvency Rate: The fraction of CCP-covered individuals who enter the broad state of insolvency, by judicial district and quarter. An individual is broadly insolvent if they have at least one loan in their CCP report in that quarter that is 120+ days past due, severely derogatory, or bankrupt (`crtr_attr16`, `crtr_attr17`, or `crtr_attr18`).

The variable of interest in our regression analysis is the "average attorney fee by district for discharged no-asset Chapter 7 cases adjusted for inflation (including converted cases)," Table A-23 of Lupica (2011). The other covariates include:

1. Income: Annual county-level income data for 3,142 counties are drawn from the Internal Revenue Services (IRS) Statistics of Income program, which annually aggregates household-level adjusted gross income as reported on US tax forms. We calculate income at the district level as the weighted average of the average income in counties covered by that district, using the CCP district populations as weights.

2. Unemployment Rate: Annual county-level unemployment data are drawn from the Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics program. The unemployment data are reported on a monthly basis, and they cover a total of 3,145 counties. We calculate the unemployment rate at the district level as the weighted average of the average unemployment rate in counties covered by that district, using the CCP district populations as weights.

3. House Price Index: House Price Index (HPI) values are drawn at the zip code level from the CoreLogic HPI. The CoreLogic HPI uses repeat sales transactions to track changes in sale prices for homes over time, with the January 2000 baseline receiving a value of 100, and it is the most comprehensive monthly house price index available. The CoreLogic data cover a total of 6739 zip codes (representing 58 percent of the total U.S. population) in all 50 states and the District of Columbia. We calculate the HPI at the district level as the weighted average of the average HPI in zip codes covered by that district, using the CCP district populations as weights.

4. Wage Garnishment: Wage garnishment laws specify the amount of an individual's wage that may not be garnished by judgment creditors to repay debt. States either adopt

federal wage garnishment restrictions—the lesser of (a) 75 percent of the employee’s disposable earnings or (b) 30 times the federal minimum wage—or adopt their own stricter restrictions. We calculate our proxied wage garnishment covariate by estimating the wage level protected from wage garnishment under two scenarios, the minimum wage scenario and the average wage scenario. Under the minimum wage scenario, states are bound either by a multiple of the minimum wage or, in states that only designate a percentage of total income, by that percentage of estimated average income, where estimated average income is the 40-hour minimum wage over 0.298, the average ratio between 40-hour minimum wage and average income (drawn from the IRS’s Statistics of Income program) across states. Under the average wage scenario, states are bound by either the designated percentage of their average wage or, in states that only specify a minimum wage, by the the designated multiple of estimated minimum wage, calculated as the average wage times 0.298. These methods rank states very similarly. We take the minimum of the two estimates as our wage garnishment covariate.

5. Judicial State Indicator: An indicator for whether the state requires that all foreclosures be judicial (where judicial states are coded as 1).

6. Recourse State Indicator: An indicator for whether the state is a recourse state regarding mortgages (where recourse states are coded as 1).

7. Homestead Exemption: Homestead exemption laws specify the maximum value of primary residences that are generally shielded from debt repayment to judgment creditors. We use homestead exemption values collected in Table 1 of Rohlin and Ross (2013), extrapolating the exemption from 1999 to 2005 Q2 as the 2004 exemption and the exemption from 2005Q3 to 2013 as the 2006 exemption.

Event Studies

Our event studies, in addition to the states described above (bankruptcy, insolvency, etc.), measure the following debt characteristics of covered individuals:

1. New secured (unsecured) debt: We calculate the total number of originated secured (unsecured) loans by differencing one’s current number of loans by type with the number of loans of that type had in the previous quarter, with a minimum value of 0, using `crtr_attr2`, `crtr_attr3`, `crtr_attr6`, `crtr_attr7`, and `crtr_attr8` (`crtr_attr4`, `crtr_attr5`, `crtr_attr9`). We then sum the number of loan originations over the current quarter and the past three quarters.

2. Has Collection: An indicator for whether an individual currently has at least one collection account (generated using `cma_attr3909`).

3. Collections Balance: The total balance of an individuals’ collection accounts, conditional on their having at least one collection account (generated using `cma_attr13`).

4. Has Judgment: An indicator for whether an individual has experienced a ”judgment public record item” within the past 7 years (generated using `cma_attr3813`).

5. Age Judgment: The number of months since an individual’s most recent ”judgment public record item”, conditional on their having had at least one such judgment in the past seven years (generated using `cma_attr3813`).

6. Has Inquiry: An indicator for whether an individual has made at least one loan inquiry (a "hard pull" of one's credit report) in the past 12 months (generated using `cma_attr3001`).

B Evidence on Negative Selection: Payroll Data

So far, we have assumed that low credit score individuals and non-homeowners are more likely to be liquidity constrained, based on the notion that they have lower income. In this section, we use supplementary payroll data from a large income verification firm for 2009 to provide support for this notion. This data is merged with our credit panel data, allowing us to map individuals' incomes for 2009 to their credit files.

The data is derived from a large nationally representative income verification firm. The information provided for each employee includes the last three years of total income, the date of first hire, tenure, and for the current year status (part time/full time), weekly hours, pay rate and pay frequency. The data is described in more detail in Appendix ???. To measure income, we use an imputed measure of total income obtained by computing pay rate times pay frequency, expressed in annual terms, yielding about 11,000 observations for 2009.²⁶ The sample of records is nationally representative, both in terms of geographical and age distribution. The resulting income measure is comparable in distribution to the CPS and the American Community Survey, as described in more detail in Appendix ???.

We compare individuals' incomes by credit score distribution, as well as the distribution of income distributions by homeownership status. Our evidence shows that low credit scores and non-homeownership are strong predictors of low income.

Table 10 provides information on the income distribution by credit score quintile. Each entry display the probability of being in a given income quintile, given that an individual belongs to a give credit score quintile. Individuals in the first credit score quintile have a 36% probability of being in the first income quintile, and a 62% probability of being in the first two quintiles of the income distribution. By contrast, individuals in the top quintile of the income distribution have a 42% probability of being in the top income quintile.

Table 10: Distribution of Income by Credit Score Quintile

Income Quintile	1	2	3	4	5	Count
CS Quintile						
1	0.36	0.26	0.20	0.12	0.05	1707
2	0.31	0.25	0.24	0.15	0.05	1949
3	0.27	0.20	0.21	0.20	0.12	2158
4	0.13	0.15	0.21	0.24	0.26	2300
5	0.08	0.09	0.17	0.23	0.42	2483

²⁶For the observations that have both reported total income and pay rate and frequency, our imputed measure matches total income very well. For details, see Appendix ???.

Table 11 provides information on the income distribution by homeownership status. Current homeowners' probability of being in the lowest income quintile is 10%, while it is 34% for current non-homeowners. By contrast, current homeowners' probability of being in the top two income quintiles is 57%, while it is only 21% for non-homeowners.

Table 11: Distribution of Income by Current Homeownership Status

Income Quintile	1	2	3	4	5	Count
Current Homeowner						
0	0.34	0.24	0.20	0.13	0.08	5153
1	0.1	0.12	0.21	0.26	0.31	5444

The payroll data is strongly suggestive that low credit scores and no owning a home are good proxies of low income. This evidence provides further support that liquidity constraints are driving the response to the bankruptcy reform.

The construction of these variables is described in detail in an appendix available from the authors upon request.

C Additional Results

Below, we give additional figures referenced in the main text.

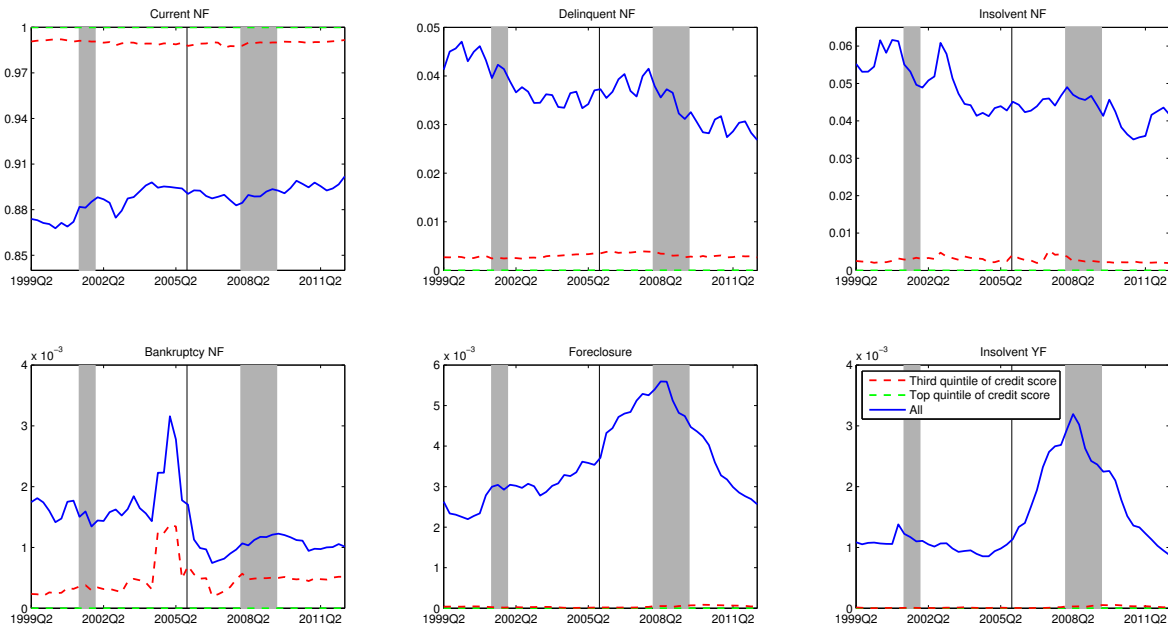


Figure 17: Four quarter ahead transition probability from Delinquent NB NF.

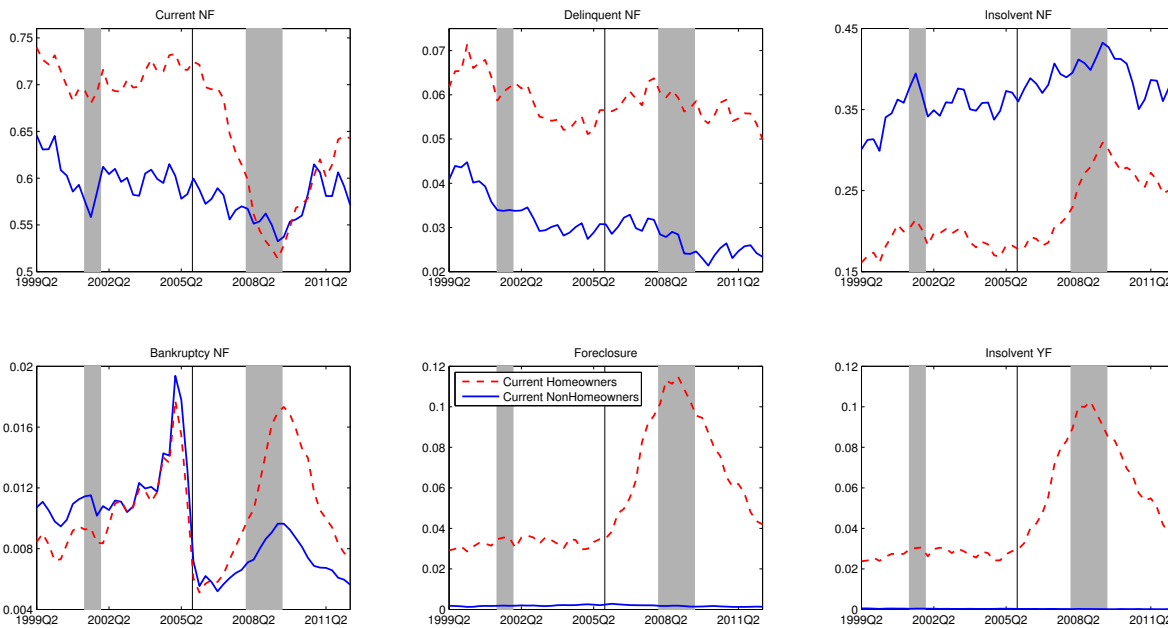


Figure 18: Four quarter ahead transition probability from Delinquent NB NF, by ever home ownership status.

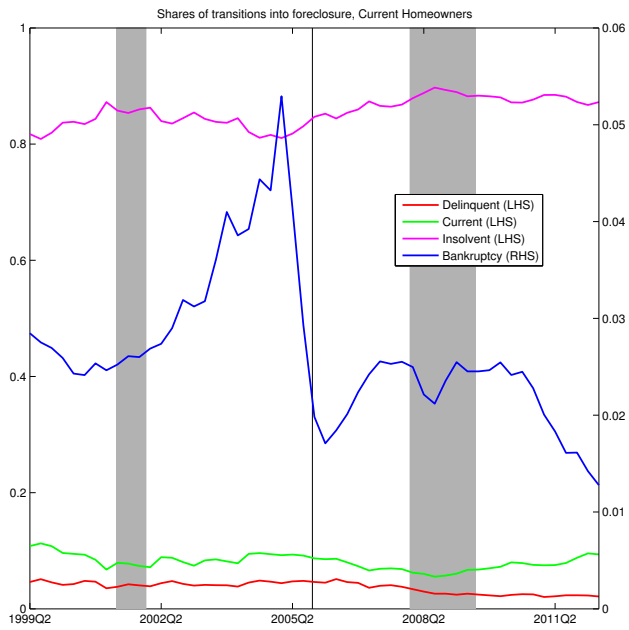


Figure 19: Four quarter ahead transition probability from Delinquent NB NF into foreclosure NB. Fraction of transitions into each sub-state. Ever homeowners, 1% sample.