Insolvency After the 2005 Bankruptcy Reform*

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Abstract

This paper provides a comprehensive analysis of the response to the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), the most important reform of personal bankruptcy in the United States in recent years. The 2005 legislation overhauled eligibility requirements and increased monetary costs of filing for bankruptcy. Using administrative credit report data from a national representative panel, we study the effects of the reform on bankruptcy filing, insolvency, and foreclosure.

We find that the reform caused a permanent drop in Chapter 7 filings, due to the rise in filing costs associated with the reform, but had no effect on Chapter 13 filings. Since filing costs need to be settled upfront for Chapter 7, while they can be paid in installments for Chapter 13, this response is consistent with liquidity constraints. Additionally, we find that the decline in bankruptcy filings resulted in a rise in the rate and persistence of insolvency, and an increase in foreclosures. We show that insolvency is associated with worse financial outcomes than bankruptcy, as insolvent individuals have less access to new lines of credit and display lower credit scores than individuals who file for bankruptcy. These effects are concentrated at the bottom of the income distribution, suggesting that BAPCPA may have removed an important form of relief from financial distress for this group.

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1 Introduction

Personal bankruptcy is a form of social insurance offering relief to individuals who are unable to repay previously contracted debt, due to income loss or sizable unplanned expenditures.[1] As most forms of social insurance, the debt discharge offered under bankruptcy may generate moral hazard, raising important positive and normative questions on the effects of personal bankruptcy on household indebtedness and delinquency behavior, as well as on the optimal design of the institution of personal bankruptcy. This paper seeks to address these questions by providing a comprehensive analysis of the response to the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act. This legislation introduced the most comprehensive reform of personal bankruptcy since the Bankruptcy Reform Act of 1978, which first introduced personal bankruptcy in its current form in the US. The 2005 reform overhauled filing requirements and substantially increased the monetary cost of filing for bankruptcy, leading to a sizable permanent reduction in bankruptcies. This reform can serve as a natural laboratory to assess the impact of changes in eligibility requirements and monetary costs on filing behavior, and provide valuable insights on the balance between the social insurance provided by personal bankruptcy versus the moral hazard associated with any such insurance.

The main provisions of the law were to introduce an income test requiring Chapter 7 filers to have income below their state's median, effectively removing the possibility of choosing the filing chapter. It also mandated a fixed 5 year repayment plan for Chapter 13 filers and increased refiling restrictions for both chapters. The new law also increased the cost of filing in a variety of ways. It raised court filing fees and mandated that filers attend compulsory credit counseling classes at their own expense. It also increased reporting requirements in bankruptcy petitions and introduced a new provision that attorneys can now be held personally liable for inaccuracies in information reported to the court during the filing procedure. These changes led to a sizable rise in attorney fees for bankruptcy cases. The median rise in attorney fees was 33% for Chapter 7 filers, from a median value of $663 dollars pre-reform to $986 post-reform. For Chapter 13 filers, the median rise in attorney fees was 25%, from a median value of $1847 pre-reform to $2515 post reform.[2] Given the evidence showing that liquidity constraints play a sizable role in the decision to file for bankruptcy, leading individuals file on paydays (Mann and Porter (2009)) and when they receive tax rebates checks (Gross, Notowidigdo, and Wang (2012)), and the extremely low incomes of

[1] Some of the common circumstances leading to bankruptcy include loss of income due to unemployment or illness, medical bills, divorce, unplanned children. See Livshits, MacGee, and Tertilt (2007) for more detail.

[2] See Jones (2008), Lupica (2012), White (2007).

filers pre-reform (Sullivan, Warren, and Westbrook (1994), Sullivan, Warren, and Westbrook (2006)) cost changes of the magnitude implied by the reform can be a significant impediment to filing for bankruptcy.

Our analysis is based on anonymous administrative credit report data from a nationally representative panel of U.S. individuals from 1999 to 2013, provided by the Federal Reserve Bank of New York's Consumer Credit Panel/Equifax. These data allow us to observe the drop in bankruptcies and the changing characteristics of who file for bankruptcy, as well as the behavior of financially distressed individuals who post-2005 decide not to file. A large literature following BAPCPA's introduction studies its effects on the bankruptcy filing rate and on the characteristics of those who file for bankruptcy, based mainly on surveys of filers or bankruptcy courts records.[3] Our analysis is the first to shed light the individuals who no longer file for bankruptcy post-reform, and in particular their foreclosure and insolvency behavior, as well as their access to credit and credit score, in comparison to those who do file. We provide four sets of results.

First, we show that, controlling for a comprehensive set of court district level economic and regulatory variables, BAPCPA is associated with a large drop in Chapter 7 bankruptcy filings (80 log points), no change in Chapter 13 filings, a rise in foreclosures (40 log points), and a rise in the fraction of individuals who are insolvent–have severe credit delinquencies but do not file for bankruptcy (20 log points).[4] Using a novel income imputation procedure, we show that the strength of these responses is larger for individuals with income below their state's median. We also show that the response to the rise in attorney fees associated with the reform is stronger for individuals with income below their state's median, confirming the hypothesis that the rise in filing costs, not the income test for Chapter 7 eligibility, was the main mechanism through which reform affected bankruptcy behavior.

Second, we exploit the variation in attorney fees, which account for about 75% of the total cost of filing for bankruptcy (see Lupica (2012)), across U.S. districts pre- and post-reform to quantify the role of the monetary filing cost on bankruptcy filings.[5] We find that higher attorney fees are strongly negatively related to Chapter 7 bankruptcies, but not

[3]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 2005 reform did not change the income composition of bankrupts but increased their in-bankruptcy debt and the length of time before filing.

[4]Insolvent individuals are those with any debts that are 120 days or more late or charged off.

[5]Even though the 2005 reform is a federal law, both the initial level of the fees and the change associated with the reform exhibit sizable cross-district variation. We show that this variation is unrelated to district level behavior, and exploit it using a difference-in-difference specification in order to quantify the effects of the fee changes.

to Chapter 13 bankruptcies. Our estimates imply that moving from the 25th to the 75th percentile of the fee distribution increases the drop in Chapter 7 bankruptcy flows by 18 log points. A crucial difference between Chapter 7 and Chapter 13 attorney fees is that fees for Chapter 7 have to be paid up-front, while fees for Chapter 13 can be paid in installments during the bankruptcy discharge period. Since the fees for both chapters increased by similar magnitudes post-reform, this suggests that the up-front nature of the filing cost for Chapter 7 bankruptcy plays a crucial role in discouraging potential filers, supporting the interpretation that these individuals are liquidity constrained.[6]

Third, we document the substitution patterns from Chapter 7 and Chapter 13 bankruptcy to foreclosure, insolvency and complete debt repayment, by estimating district-level mean effects of the reform. We find a strong substitution from Chapter 7 bankruptcy to foreclosure and insolvency, but no impact on complete debt repayment. The effect of the median estimated drop in flows into Chapter 7 bankruptcy can account for a 27.5% increase in flows to foreclosure (out of and estimated 33%) and a 2.65% increase in the persistence of insolvency (out of an estimated 3.5%). This indicates that individuals who are not filing for Chapter 7 bankruptcy protection either relieve financial distress through foreclosure or remain insolvent, but do not pay back their delinquent debt. We find essentially no impact of substitution from Chapter 13 filing to insolvency and foreclosure, and no substitution from Chapter 7 to Chapter 13, which suggests that the reform was not effective in channeling individuals from Chapter 7 to 13. Thus, the individuals who no longer file for Chapter 7 bankruptcy post-reform experience a form of persistent and severe financial distress.

Finally, since our analysis indicates a shift from Chapter 7 bankruptcy to persistent insolvency in response to the reform, it is important to determine whether this change is consequential. To this end, we examine access to credit and credit scores for financially distressed individuals, distinguishing between whether they file for bankruptcy or not. We consider cohorts of newly insolvent individuals, comparing those who file for Chapter 7 and or Chapter 13 bankruptcy in the 8 quarters after the new insolvency and those who don't. We then examine the behavior of several financial indicators for a 2 year window around that new insolvency.

Individuals who file for Chapter 7 bankruptcy open new unsecured lines of credit and auto loans at a higher rate after filing than individuals who don't file, or file for Chapter 13 bankruptcy.[7] For mortgage originations both Chapter 7 and Chapter 13 filers display an

[6]It would be difficult for filers to borrow to finance Chapter 7 filing costs, since debts is contracted close enough to filing date are considered fraudulent, due to lack of intent to repay, and cannot be discharged.

[7]The fraction of Chapter 7 with new unsecured debt originations in approximately 25% higher than the fraction for Chapter 13 filers and non filers. The difference for auto loans is about 100%.

advantage relative to non-filers, with the gap growing post-reform. Since, as we show, the number of inquiries is very similar across the two groups, these findings indicate a difference in access to credit for these two groups, rather than demand for credit. This is reflected in the behavior of credit scores. Within the same cohort of newly insolvent individuals, we find that those who will eventually go bankrupt initially have lower credit scores, suggesting that they are negatively selected. However, these individuals experience a sharp boost in their credit score after they file for Chapter 7 bankruptcy, whereas credit scores recover at a much slower pace for individuals who remain insolvent or file for Chapter 13 bankruptcy. We conclude that, while both insolvency and bankruptcy are forms of default, the debt discharge associated with Chapter 7 bankruptcy outweighs the potentially negative signal associated with a bankruptcy flag and leaves filers with better access to credit than individuals who become insolvent in similar circumstances.

Our analysis has wide-ranging implications for the design of policies regulating consumer credit and bankruptcy, as well as for theoretical modeling of consumer default. Our results are consistent with the presence of a group of liquidity-constrained individuals who do not file for bankruptcy and seem unable to pay off their delinquent debt. This is consistent with findings in Mann and Porter (2009) and Gross, Notowidigdo, and Wang (2012) pointing to a role of liquidity constraints in bankruptcy decisions, and more general with evidence on binding liquidity constraints.[8] Our findings suggest that any policies affecting the monetary cost of filing for bankruptcy will impact disproportionately these individuals, who are concentrated at the bottom of the income distribution and would be expected to benefit most from the relief offered by bankruptcy.

Viewing bankruptcy in the broader sphere of social insurance programs, our results suggest that the personal bankruptcy procedure in its current form would benefit from reform. If we interpret the monetary costs associated with bankruptcy filing from a costly state verification perspective– as inTownsend (1979) and related literature– it is natural to assume that these costs should be borne by the filer to provide incentives. However, this framework does not allow for binding liquidity constraints on the filer and is thus inadequate, as currently formulated, to provide realistic policy prescriptions.[9] Moreover, for other programs in which verification of the state is required, such as disability insurance, the applicant does not incur in any direct monetary expenses to determine eligibility.

[8]See, for example, Gross and Souleles (2002a), Johnson, Parker, and Souleles (2006), Parker et al. (2013) among others.

[9]Grochulski (2010) presents a private information environment in which bankruptcy with an income test is used to implement the constrained efficient allocation. There is no fee for bankruptcy filing and liquidity constraints are not considered.

We also find that the decline in Chapter 7 bankruptcy following BAPCPA is associated with an immediate and very sizable rise in foreclosure.[10] There are a number of channels through which bankruptcy may reduce foreclosures. For example, individuals who file for bankruptcy may be able to renegotiate the terms of their mortgage loans, and thus prevent or repair a mortgage delinquency, preventing foreclosure. Moreover, for Chapter 7 filers who are below their state's homestead exemption levels, the ability to discharge their unsecured debt may prevent any delinquencies on the home debt. Given that BAPCPA took effect about a year prior to the start of the housing crisis associated with the 2007-09 recession, our results strongly suggest that the bankruptcy reform may have exacerbated the subsequent housing crisis, through the effects of foreclosures on subsequent house price drops.[11]

Finally, we provide a systematic analysis of the consequences of failure to file for bankruptcy for financially distressed individuals. We show that individuals who file for Chapter 7 bankruptcy are more successful at obtaining new lines of unsecured credit and auto loans, and both Chapter 7 and Chapter 13 filers obtain more mortgage loans after filing, relatively to ex ante similar individuals who do not file. Filing for Chapter 7 bankruptcy is also associated with a sizable boost in credit scores, further supporting the notion that bankruptcy allows for better access to credit. Given the relief offered by bankruptcy relative to insolvency, and the presence of liquidity constraints affecting the filing decision, our results are inconsistent with the view, proposed in Ausubel and Dawsey (2004), that marginal households would be indifferent between Chapter 7 bankruptcy and insolvency.[12] As such, our study is complementary to Dobbie and Song (2015), Dobbie, Goldsmith-Pinkham, and Yang (2015), who document the beneficial effects of obtaining a Chapter 13 filing on an individual's future outcomes.

Standard models of household default with idiosyncratic risk in income or expenditure assume that bankruptcy prevents future access to credit, do not incorporate liquidity constraints associated with bankruptcy filing, and do not allow for a delinquent state, in which no debt relief is possible and access to credit is severely curtailed. (See Chatterjee et al. (2007) and Livshits, MacGee, and Tertilt (2007) for classic contributions). Our analysis suggests that incorporating monetary costs of bankruptcy, liquidity constraints, informal default without debt relief, and credit access after bankruptcy, would significantly affect the quantitative predictions of these models for debt and delinquency behavior, and allow them

[10] See Morgan and Strain (2007) and White and Zhu (2008) for early evidence of this pattern.

[11] For a discussion of the effects of foreclosures on house prices, see Mian, Sufi, and Trebbi (2011).

[12] Our analysis does not capture the psychological costs associated with filing for bankruptcy. For example, Sullivan, Warren, and Westbrook (2006) and Gross and Souleles (2002b) argue for the presence of social stigma faced by bankruptcy filers.

to offer a more accurate assessment of the welfare implications of incomplete insurance.

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 3 reports our estimates of transition probabilities into various delinquency states. Section 4 describes our cross-district regression analysis. Section 6 examines the implications for access to credit and scores of the inability to file for bankruptcy. Section 7 concludes.

2 The 2005 Bankruptcy Reform

Households in financial distress in the U.S. can resolve their insolvency by filing for bankruptcy protection, which grants them immediate relief from all collection efforts, including direct communication, lawsuits and wage garnishment orders. Most unsecured debt is dischargeable, excluding taxes, alimony and child support obligations, student loans and debt obtained by fraud.

Chapter 7, usually called 'straight bankruptcy' or 'fresh start' option, is the most commonly used bankruptcy procedure - 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 levels[13] 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. Before 2005 Chapter 7 bankrupts were not allowed to re-file another Chapter 7 case for the next 6 years, and have a bankruptcy flag on their credit report for 10 years after filing.

Chapter 13 filers keep all of their assets, but must use their future income to repay part of their unsecured debt[14]. Before the 2005 reform, filers would propose their own repayment plans 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. Prior to BAPCA, there were no limits to filing for Chapter 13 bankruptcy. Prior to the 2005 reform, a filer could choose between filing for Chapter 7 or 13 (see White (2007)).

Historically, ever since the introduction of the bankruptcy law as we know it, both un-

[13]Asset 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.

[14]More 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').

secured debt levels and bankruptcy rates have been rapidly rising over time (the trend extending all the way back to 1978). This trend gave rise to numerous studies on the sources of the rise[15], and generated an active policy discussion on the efficiency of existing law. That discussion resulted in the 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA).

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 test to determine eligibility for filing for Chapter 7 bankruptcy. Specifically, to be eligible to file for Chapter 7, individuals's income must be below a state median that is adjusted for family size. Individuals who fail the income test can still file if (i) their monthly income net of allowable expenses calculated according to IRS rules be less than $166.67 per month or (ii) their net monthly income multiplied by 60 be less than 25 percent of their unsecured debt. In addition, individuals with business income can always file for Chapter 7. The income test for Chapter 7 eligibility essentially eliminated the ability of filers to choose the filing chapter. In addition, Chapter 13 filers lost the ability to propose their own repayment plans. Under BAPCPA, repayment plans last 5 years and are based on a notion of disposable income, which depends on family size and on expense allowances determined on the basis of the size of the family dwelling, the number of vehicles owned etc. (see White (2007)). In addition to essentially removing a filer's choice of chapter, the reform increased the refiling limits to 8 years for for Chapter 7 and 2 years for Chapter 13.

There was also a significant increase in the filing documentation burden for both chapters. Filers 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, and are held liable for the accuracy of claims. In addition, the Act requires debtors to enroll in a credit counseling class before they file and a financial management course before their debts are discharged.

The sum of these provisions resulted in a significant rise in the cost of filing for bankruptcy. 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

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

in Lupica (2012)). In our study, we focus on attorney fees and their increase associated with the reform. Attorney fees comprise 75% of the total monetary cost of filing for Chapter 7 bankruptcy and 90% of the cost of filing for Chapter 13 (Lupica (2012)), and rose on average 35% and and 29%, respectively, after the reform.

3 The Effects of BAPCA over Time

We use the Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data (CCP), which is an anonymous longitudinal panel of individuals, comprising a 5% random sample of all individuals who have a credit report with Equifax. The data is on quarterly frequency, starting in 1999:Q1 and ending in 2013:Q3. The data is described in detail in Lee and van der Klaauw (2010). In our analysis, we use a 1% sample, which includes information for approximately 2.5 million individuals in each quarter.

The data contains over 600 variables,[16] 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 Appendix A.

3.1 Transitions

To understand the path into financial distress and into bankruptcy, we estimate the probability of transitioning between a set of mutually exclusive financial states at different horizons. This approach uses the panel nature of the data and allows us to identify the timing and magnitude of the response to the reform. In any given quarter, an individual's state can be 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 debt that is 120 days plus delinquent or in charge-off.[17] An individual is Bankrupt, if she displays a bankruptcy flag, or in Foreclosure if she displays a foreclosure flag. The bankruptcy flag is activated by a new bankruptcy filing, where we distinguish between Chapter 7 and Chapter 13. The bankruptcy flag for Chapter 7 stays on the record for 10 years. The one for Chapter 13 stays on the record for 7 years after the payment plan has been completed.The foreclosure

[16]For data dictionary, go to `http://www.newyorkfed.org/householdcredit/2013-q3/data/pdf/data_dictionary_HHDC.pdf`.

[17]Student debt is not dischargeable in bankruptcy, and is excluded from the analysis.

flag is activated by a new foreclosure record on the individual's account, and lasts for 7 years from its first appearance.

We estimate the 4-quarter-ahead transition probabilities across these states for each quarter in the sample, starting from a *new delinquency* and a *new insolvency*. A new delinquency occurs when an individual experiences a delinquency, after 8 quarters without delinquencies, insolvencies, bankruptcy or foreclosure. We interpret a new delinquency as the possible start of a new spell of financial distress. Approximately, 0.8% of the population becomes newly delinquent in each quarter in our sample, and 73% of new Chapter 7 and Chapter 13 filers display delinquencies in the 2 quarters preceding filing. We also consider transitions from a new insolvency, which occurs when an individual becomes insolvent after 8 quarters of no insolvencies, with no bankruptcy or foreclosures. A new insolvency captures the start of a spell of more severe financial distress. Approximately 0.6% of the overall population becomes newly insolvent in each quarter of our sample, and this percentage is stable over time. Around 97% of newly insolvent individuals show a delinquency in the 2 quarters prior a new insolvency.

To eliminate the effects of business cycles and other economic factors possibly driving the transitions from a new delinquency or insolvency to bankruptcy and other outcomes of interest, we estimate the following regression:

$$y_{it} = \sum_{s(t)\neq 0} \beta_{s(t)} I_{s(t)} + \gamma_i + \phi X_{it} + \epsilon_t, \tag{1}$$

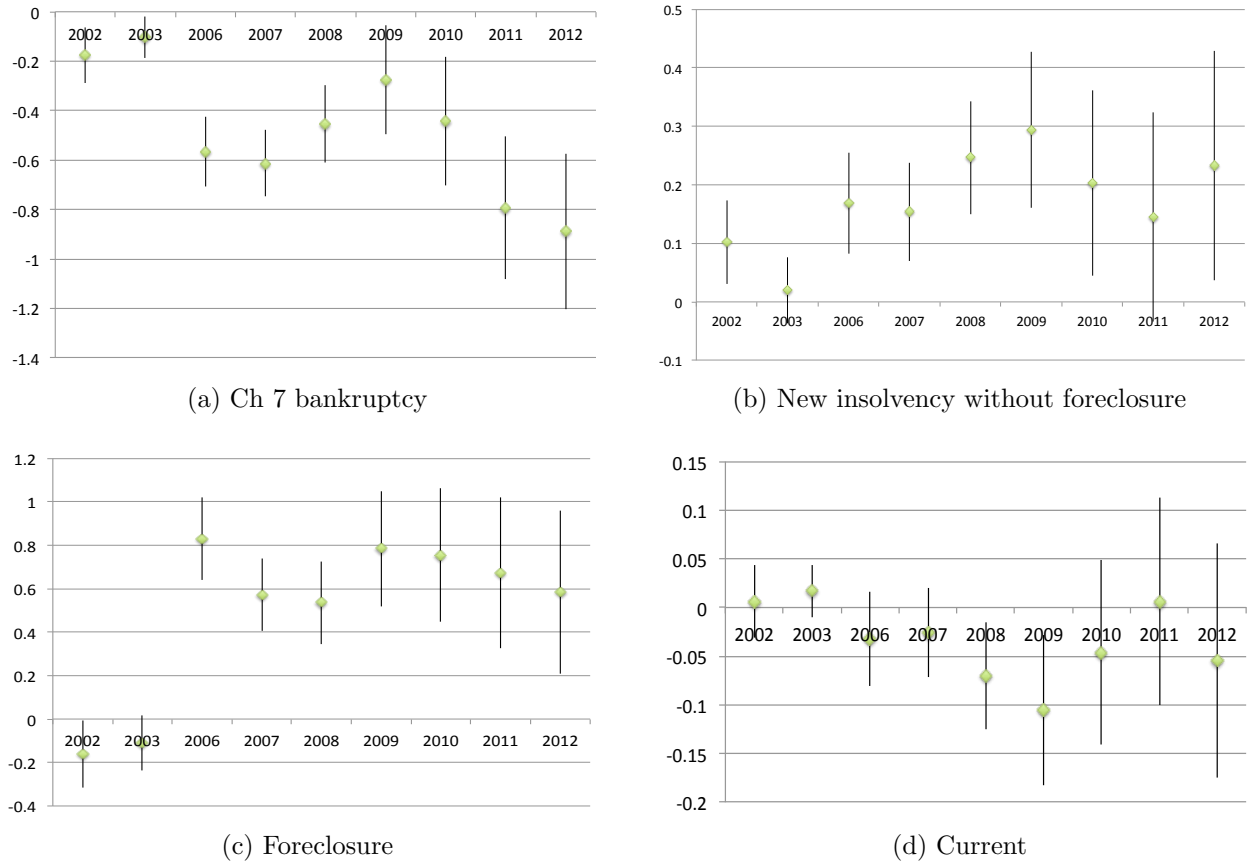
where y_{it} is the log transition in district i at quarter t, $\beta_{s(t)}$ capture time effects, relative to base period 0, $I_{s(t)}$ is an indicator for period s (year or quarter), γ_i denote district effects, and X_{it} denotes a set of economic controls, in logs.[18]

The estimated $\beta_{s(t)}$ capture the timing and magnitude of the response to the reform. They are also able to detect the presence of any pre-existing trends in the transitions of interest. We report the estimates of the time effects for the yearly specification below, starting from the transitions from a new delinquency.[19] Figure 1 reports the estimate for the time effects for the transitions from a new delinquency.

The top left panel displays the estimates for the transitions into Chapter 7 bankruptcy, which show a sizable and permanent drop in the transitions. The drop is approximately

[18]These include district level personal income, unemployment rate and home price index, as well as the 4 quarter change in these variables.

[19]The estimates of the coefficients for the controls and for the quarterly specification do not change the conclusions of this section, and are available from the authors upon request.



(a) Ch 7 bankruptcy

(b) New insolvency without foreclosure

(c) Foreclosure

(d) Current

Figure 1: $\beta_{s(t)}$ for 4 quarter ahead transition probability from Newly Delinquent. Bars denote 95% confidence intervals. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

equal to 60 log points between 2005 and 2006-2008, and rises to 100 log points in 2011 and 2012, after abating somewhat during 2009 and 2010. Moreover, after controlling for economic controls and district effect, there appears to be no trend in the transition into bankruptcy after a new insolvency in the years prior to the reform. All the $\beta_{s(t)}$ coefficients are significant at least at the 5% level. The top right panel displays the transition from a new delinquency to insolvency, without foreclosure. In this case, there is a sharp and persistent rise in the transition to insolvency post reform, averaging approximately 20 log points. The bottom left panel displays the transition from a new delinquency to foreclosure (without bankruptcy), which rises by 80-100 log points post reform. Finally, the bottom right panel displays the transition probability from a new delinquency to Current. The probability declines by 5-15 log points post reform, suggesting that the decline in bankruptcy is not matched by a greater ability of newly delinquent individuals to repay their debt and return to being current.

Figure 2 displays the estimates for the transition into Chapter 7 bankruptcy and foreclosure. The transition into Chapter 7 bankruptcy (left panel) drops by 20 to 60 log points relative to the pre-reform average in this case, with the drop maximized in 2006-2008 and 2011-12. The right panel displays the transitions into foreclosure, which rises by approximately 40 log points in the post reform period.

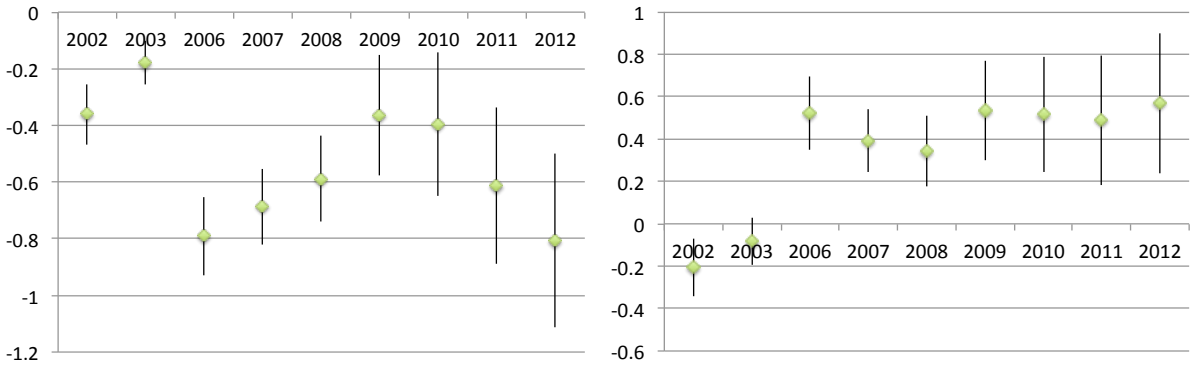


Figure 2: $\beta_{s(t)}$ for 4 quarter ahead transition probability from Newly Insolvent to Chapter 7 bankruptcy (left panel) and foreclosure (right panel). Bars denote 95% confidence intervals. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

The link between bankruptcy filing, real estate debt and foreclosure has been extensively discussed in the literature.[20] This link can arise via several mechanisms. First, a bankruptcy filing, both for Chapter 7 and Chapter 13, will stay a pending foreclosure procedure or the beginning of such procedure. We rule out this effect, as we look at individuals who have no prior foreclosure flags when they experience a new delinquency or a new insolvency. In addition to this mechanical effect, individuals who file for bankruptcy may be able to renegotiate the terms of their mortgage loans, and thus repair a home debt delinquency, preventing foreclosure, or be able to cure an existing foreclosure. Finally, especially for Chapter 7 filers who are below their state's homestead exemption levels, the ability to discharge their unsecured debt may prevent any delinquencies on the home debt. On the other hand, the inability to file for bankruptcy may make foreclosure more appealing, as it enables individuals to discharge–at the cost of losing their home–their home debt, which may enable them to remain current on their other debt.[21] In Section 5.3, we give evidence of a more direct

[20]Indeed, Fay, Hurst, and White (2002) argue that the financial benefit of filing for bankruptcy is intrinsically linked to real estate net worth, via the homestead exemption and other factors. See also Li (2009), Carroll and Li (2011), Morgan and Strain (2007), White and Zhu (2008), and Morgan, Iverson, and Botsch (2012).

[21]Our findings that transitions into foreclosure rise in response to the bankruptcy reform could be driven

link between the decline of the transition into Chapter 7 and Chapter 13 bankruptcy and the rise in foreclosure at the district level, that strongly suggests that the rise in foreclosure post-BAPCPA is associated with the resulting decline in Chapter 7 bankruptcy.

Finally, we consider transitions into Chapter 13 bankruptcy filings from both a new delinquency and a new insolvency. The results are displayed in figure 3. As can be seen from the figure, the transition to Chapter 13 bankruptcy marginally declines from both a new delinquency (left panel) and a new insolvency (right panel), but the drop associated with the reform is mostly not significant and much smaller than for Chapter 7 bankruptcy.

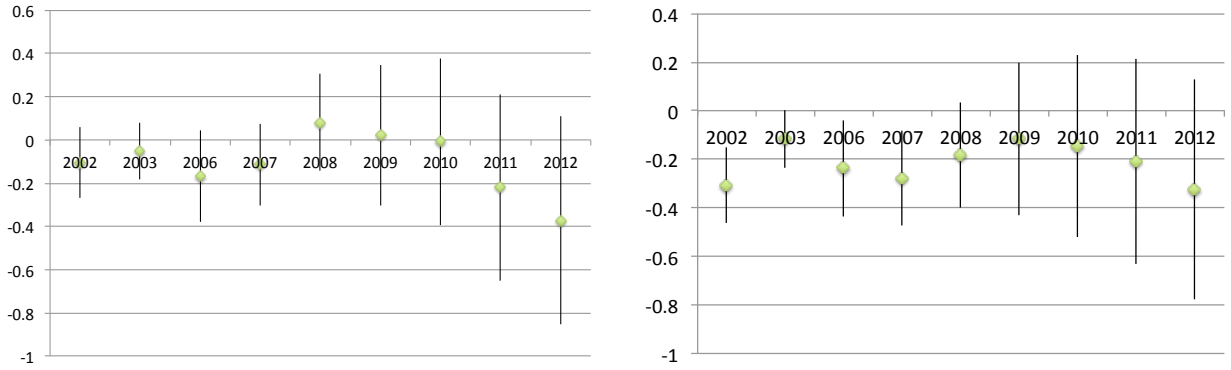


Figure 3: $\beta_{s(t)}$ for 4 quarter ahead transition probability from Newly Delinquent (left panel) and Newly Insolvent (right panel) to Chapter 13 bankruptcy filings. Bars denote 95% confidence intervals. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

The fact that transitions into Chapter 13 bankruptcy do not significantly respond to the reform is consistent with evidence that the ratio of Chapter 13 to Chapter 7 bankruptcies has risen post reform (see Han and Li (2011) and Zhu (2011)), and suggests that the effect on this ratio is driven by the response of Chapter 7 filings, not by a response of Chapter 13 filings. In Section 5.3, we show that there is no substitution between Chapter and Chapter 13 filing.Moreover, in Section 5, we show that there is no link between the change in Chapter 13 attorney fees and the decline in Chapter 13 filings across districts, which we take as evidence supporting our hypothesis that the reduction of bankruptcy filings following BAPCPA was due to liquidity constraints.

by any one of these mechanisms, and we plan to explore the empirical importance of these alternative forces in future work.

3.2 Transitions by Income

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 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, linked to Equifax, from a large income verification firm. We use these data to impute labor income to individuals in our Equifax sample. The details of our imputation method are discussed in Appendix B.

In summary, our method is based on using the matched payroll data to estimate an individual's income quartile at the state level, as a function of her debt holdings, age, age squared and zip code. Debt categories included are auto, home, and student debt, where for each category, we index an individual's decile in the holdings of a particular debt category. This approach is robust to changes over time in the relation between debt levels and income levels. We estimate this relation for 2009, and then use the estimated coefficients to determine an individual's income ranking for all quarters. For 2009, we verify the accuracy of our imputation approach in the sample of individuals for which we have income data. We find that our imputation is highly successful at predicting whether individuals are in the first or fourth income quartile, and moderately successful at predicting whether individuals in the second and third quartile. We use this method to determine whether an individual is below or above their state's median income. This cut-off is relevant since BAPCPA introduced an eligibility requirement for Chapter 7 filers, requiring their income to be below the state median, adjusted for family size.

We estimate regression (1) for individuals below and above the median imputed income at the state level in each district and compare the estimates in figure 4. The estimates indicate that the effects of the reform are more pronounced for individuals below the state level median of the imputed income distribution. Panel (a) of figure 4 displays the estimates for the transition from new insolvency to Chapter 7 bankruptcy. The drop in the transition into bankruptcy is deeper and more persistent for individuals below the median of the income distribution. The transition from a new insolvency to bankruptcy filing drops by 90 log points between 2004 and 2006 for individuals below their state median income, while it only drops by 50 log points for individuals above the median. The transition into Chapter 7 filing rises for individuals below the median income during the 2007-09 recession, but it is still

20 log points lower than in 2004. It drops again for this group to -80 log points relative to 2004 by the end of our sample. For individuals above the median of imputed income, the bankruptcy settles to approximately 40 log points lower than in 2004 by 2008. The difference between the transition from insolvency to Chapter 7 bankruptcy for individuals below and above the median of imputed income is significant at least at the 10% level for most years, and significant at the 5% level in 2006-2009 and in 2011-2012.

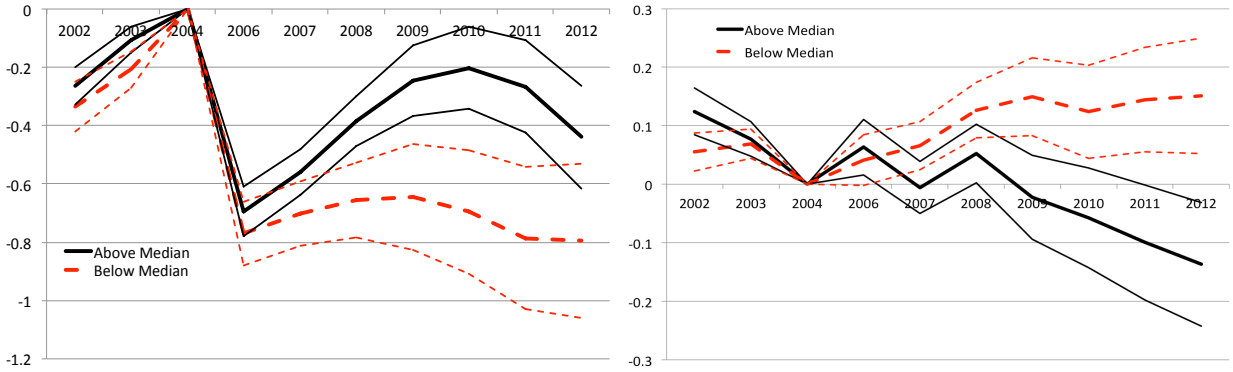
The persistence of insolvency– that is the flow from a newl insolvency to insolvency– is the other outcome that displays the most variation in response across imputed income groups. As shown in panel (b) of figure 4, individuals with below median income experience a sizable 15 log point rise in the probability of staying insolvent at the 4 quarter horizon, in stark contrast to individuals above median, who display a 13 log point drop in this transition. This is consistent with the interpretation that higher income individuals who do not file for bankruptcy pay off their insolvent balances, while poorer households who do not file remain insolvent.

Panel (c) displays the transitions into Chapter 13 filing showing essentially no statistical effect of the reform for either group. This reinforces our interpretation that the up-front nature of the Chapter 7 attorney fees is the main driving force behind the effects of the law. We formally assess this hypothesis in Section 5.

Finally, panel (d) displays the estimates for the transition from a new insolvency to foreclosure. Here, we see a sizable and persistent rise for both groups. Individuals above the state median inputed income experience a sizable increase of 80 log points immediately after the reform, stabilizing at 60 log points higher than pre-reform in 2007. Individuals below the median state income display a more gradual rise between 2005 and 2008, and acceleration of the increase during the Great Recession. The flow into foreclosure stabilizes 40 log points above pre-BAPCPA levels in 2010. The more dramatic increase in the transition from a new insolvency to foreclosure for individuals above the state median of imputed income is likely due to the lower homeownership rates for individuals with income below the state median.

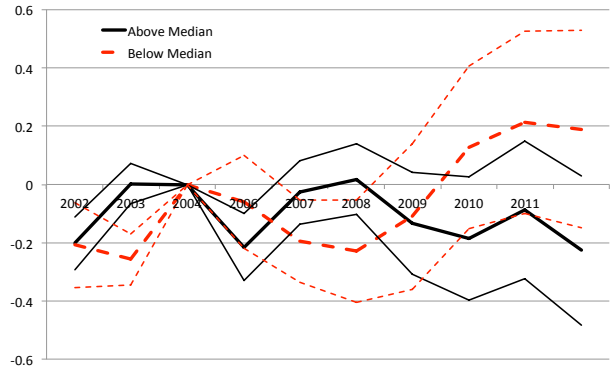
4 Variation by District

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). Attorney fees, comprising approximately 75% of total direct access costs for Chapter 7 and 90% for Chapter 13 (both pre- and post-reform), are the biggest component of filing costs. Based on a comprehensive study of filing fees, Lupica

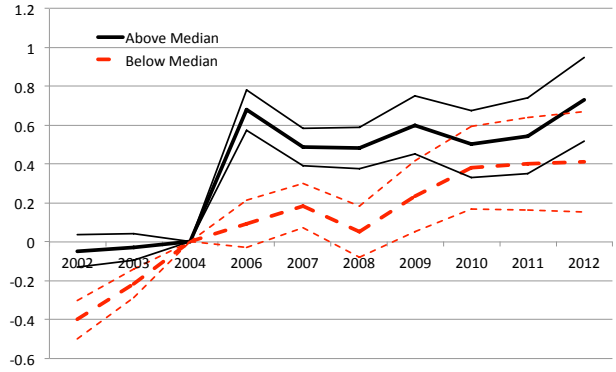


(a) Newly Insolvent to Ch.7 Bankruptcy

(b) Newly Insolvent to Insolvent



(c) Newly Insolvent to Ch.13 Bankruptcy



(d) Newly Insolvent to Foreclosure

Figure 4: $\beta_{s(t)}$ for 4 quarter ahead transition probability from Newly Insolvent, for individuals below and above the median of imputed income. Estimates are shown with 95% confidence bands. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

(2012) reports an average increase in attorney fees of 35% for Chapter 7 filers and of 29% for Chapter 13 filers. Behind these average increases, there is significant district-level variation: for example, for Chapter 7 filers, the 90th percentile of the cost change is 61% while the 10th percentile is 17%. 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 1 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 1: Attorney fees: Chapter 7.

	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%

Source: Author's calculations based on Lupica (2012).

Table 2: Attorney fees: Chapter 13.

	Pre-reform	Post-reform	Log Difference
Mean	$1910	$2531	29%
90th percentile	$2483	$3265	58%
75th percentile	$2245	$2832	43%
Median	$1847	$2515	25%
25th percentile	$1561	$2141	15%
10th percentile	$1246	$1839	3%

Source: Author's calculations based on Lupica (2012).

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.[22] We then estimates transitions, as in Section 3, separately for the high-increase and low-increase districts.

Our main findings are reported in figures 5 and 6, where the solid (black) line displays the estimated time effects from specification (1) transition probabilities for high cost change districts, and the dashed (red) line reports this average for low cost change districts.

Figure 5 displays the time effects for the transition probability from a delinquency to insolvent without foreclosure. While there is virtually no time variation for the low cost change district, there is a sharp rise in the transition into insolvency for high cost change district starting with the reform. The change settles at 40 log points in 2008.

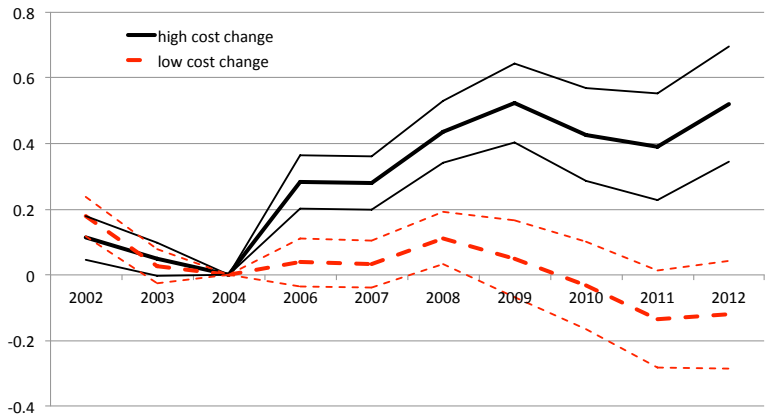


Figure 5: $\beta_{s(t)}$ for 4 quarter ahead transition probability from Newly Delinquent to Insolvent (without foreclosure) for districts in the top 30% (high cost change) and bottom 30% (low cost change) of the cost change distribution. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

The transition probability into bankruptcy from newly insolvent, displayed in figure 6 (left panel), drops more and more persistently in high cost change districts, consistent with the notion that the cost increase is the mechanism through which the reform affects the transitions into bankruptcy and severe delinquency. Finally, the transition probability from a new insolvency to foreclosure (figure 6, right panel) rises more than twice as much in high cost change districts relative to low cost change districts.

[22]We 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 have low cash holdings, increasing the potential impact of filing costs changes.

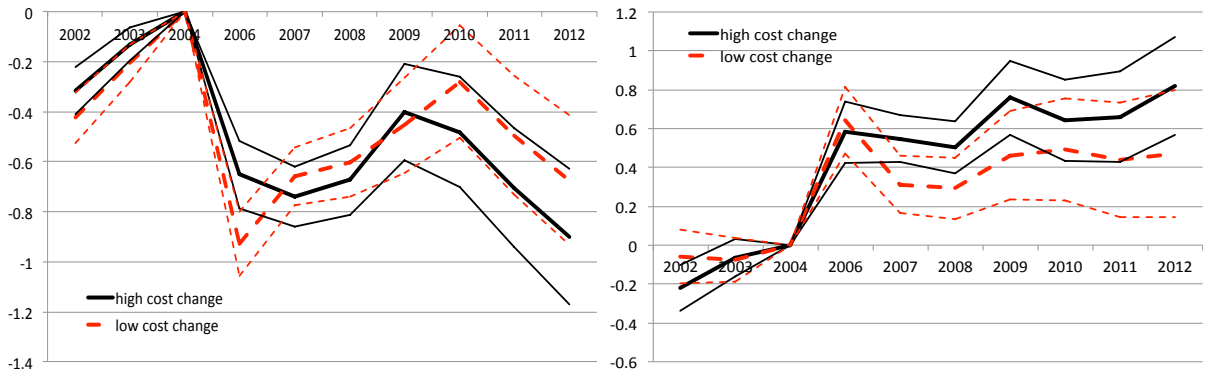


Figure 6: $\beta_{s(t)}$ for 4 quarter ahead transition probability from Newly Insolvent to Chapter 7 bankruptcy (left panel) and foreclosure (right panel) for districts in the top 30% (high cost change) and bottom 30% (low cost change) of the cost change distribution. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

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 fraction of financially distressed individuals 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 attorney fees.

5 Regression analysis

The purpose of this section is to assess the relation between the costs of filing for bankruptcy and bankruptcy decisions. To this end, we exploit the sizable cross-district variation in lawyer fees 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 change in Chapter 7 filing costs exhibited a larger decline in Chapter 7 bankruptcy rates, controlling for other district characteristics and district business cycle effects. We also show that there is no relation between Chapter 13 filing fees, their change associated with the reform, and any changes in Chapter 13 filing rates. Since the rise in Chapter 13 filing fess was similar to the rise for Chapter 7, but Chapter 13 filing costs need

not be paid upfront, we take these results as supportive for our hypothesis that the response to BAPCPA was driven by the rise in filing costs, through liquidity constraints.

We adopt the following difference-in-difference specification:

$$y_{it} = \alpha + \beta c_{i,t} + \psi I_t^{post} + \phi X_{it} + \epsilon_{it}, \tag{2}$$

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 transition probability from a new insolvency to bankruptcy filing at the district level. The coefficient β captures the effect of the log change in the cost post-reform on the log of the transition from new insolvency to bankruptcy post-reform. To see this, we take the first difference, which corresponds to time:

$$y_{it'} - y_{it} = \psi + \beta \Delta c_i + \phi(X_{it'} - X_{it}), \tag{3}$$

where t and t' denotes quarters pre-and post reform, and Δc_i denotes the log change in the attorney fee associated with the reform. Then, we take a second difference across districts:

$$\Delta y_{it} - \Delta y_{jt} = \beta(\Delta c_i - \Delta c_j) + \phi(\Delta X_{it} - \Delta X_{jt}), \tag{4}$$

where Δx_{it} denotes the log change in variable x in district i between to periods t and t', respectively before and after the reform.

This specification assumes that the sensitivity of the transition into bankruptcy to the cost level and to the economic controls is constant pre- and post- reform. We also consider less restrictive formulations, in which we relax these assumptions in turn. The results are displayed in Table 3. We include the same economic controls and state level regulatory controls in all formulations. The economic controls include logs of personal income, the unemployment rate, house price index and their 4 quarter changes. The state level regulatory controls include the wage garnishment 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.[23] 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

[23]Fay, Hurst, and White (2002) show that the homestead exemption is a key driver of household bankruptcy decisions. Moreover, Hynes, Dawsey, and Ausubel (2009) show that the regulation of debt collection at the state level can influence the decision to go bankrupt. In addition, Dobbie and Goldsmith-Pinkham (2014) show that homestead exemption and recourse in foreclosure affect default decisions and credit conditions.

variables are time invariant, we do not include district fixed effects for this specification.

Column (1) corresponds to the baseline specification. Based on the estimated value of the coefficient on the filing cost, the median rise in lawyer fees post-reform (52%) reduces the transition from a new insolvency into bankruptcy by 18 log points, in addition to the 80 log point decline of the transition into bankruptcy estimated by the coefficient on the reform dummy.[24] The transition into bankruptcy is positively related to the change in unemployment in the 4 quarters prior, and negatively related to the change in the house price index 4 quarters prior.

Column (2) reports a version of the baseline specification in which the sensitivity of the transition into bankruptcy is allowed to differ pre- and post-reform. Instead of the cost level, we include two regressors, the cost level pre-reform interacted with the pre-reform dummy, and the cost level post-reform interacted with the post-reform dummy. Notably, only the coefficient on the post-reform dummy is consistently negative, suggesting that moving from the 25th to the 75th percentile of the filing cost post-reform reduces the transition into bankruptcy by 17 log points.

Columns (3) and (4) report estimates for the baseline specification estimated only on pre- and post-reform data, respectively. This allows for changes in the sensitivity to the economic controls of the transition into bankruptcy. Both in the pre- and post-reform period, we find a sizable and significant negative relation between the filing costs and the transition into bankruptcy. Moving from the 25th to the 75th percentile of the filing cost distribution reduces the transition into bankruptcy by 13 log points in the pre- and 14.5 log points in the post-reform periods. However, the sensitivity of the transition into bankruptcy to the economic controls varies noticeably pre- and post-reform. None of the controls are significant in the pre-reform period, while post-reform, the transition into bankruptcy is significantly positively related to the 4 quarter change in income and unemployment, and significantly negatively related to the 4 quarter change in house prices.

We now discuss the exogeneity of the attorney fees and their variation and explain the IV estimates reported in the last column of Table 3.

Exogeneity of the change in attorney fees and IV Estimation One concern with using 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. Table 4 examines the relation of the filing costs and their changes with prior economic indicators, state level

[24]We exclude from the sample the period 2005.Q1 to 2006.Q1 to exclude the effects of reform anticipation that simply shift the timing of bankruptcies.

Table 3: Transition from New Insolvency to Chapter 7 Bankruptcy: OLS and IV Estimates

	(1)	(2)	(3)	(4)	(IV)
Att. Fee	-0.34 (1.96)				
Att. Fee Pre		-0.13 (0.72)	-0.49 (2.62)		-0.20 (0.98)
Att. Fee Post		-0.52 (3.06)		-0.42 (2.52)	-0.65 (2.41)
Post Dummy	-0.80 (6.49)	1.83 (1.70)			2.26 (2.65)
Income	0.32 (1.18)	-0.32 (1.2)	0.00 (0.02)	0.46 (1.71)	0.31 (1.11)
Δ Income	0.59 (1.61)	0.60 (1.82)	0.12 (0.23)	1.56 (4.06)	0.56 (1.68)
Unemp	0.17 (1.03)	0.16 (0.97)	0.12 (0.69)	0.06 (0.31)	0.20 (1.19)
Δ Unemp	0.33 (3.27)	0.33 (3.39)	-0.26 (1.65)	0.46 (4.11)	0.31 (2.92)
HPI	-0.10 (0.36)	-0.11 (0.39)	-0.08 (0.23)	-0.31 (1.00)	-0.06 (0.20)
Δ HPI	-1.01 (3.82)	-1.10 (4.32)	0.79 (0.76)	-1.55 (4.69)	-1.13 (4.00)
Regulation	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.42	0.42	0.18	0.33	0.43
N	2327	2327	1815	1512	2327

All variables (except indicators) in logs. All observations are weighted by district level population. Standard errors are clustered at the district level. Absolute values of the t-statistics are reported in parentheses. We are dropping observations from 2005.Q1 to 2006.Q1 to exclude anticipation effects. *Post Dummy* is an indicator variable for post-reform quarters. *Unemp* is the district level unemployment rate, *HPI* is the district level house price index. Δ denotes the 4 quarter change from the current quarter. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

regulation and prior bankruptcy, insolvency and foreclosure behaviors. Our results suggests that the filing costs and their changes do not display evidence of joint endogeneity. In particular, neither the cost post-reform or the cost change are related to prior bankruptcy, foreclosure or insolvency rates. In fact, the only variable in table 4 which seems to be statistically related to the cost change is the indicator for judicial foreclosure. Our conclusion is that we can reasonably assume that the joint endogeneity issues do not arise in our specification. However, for robustness, we also conduct an instrumental variable analysis.

For the instrumental variable approach, we use the cost level pre-reform to instrument for the change. The pre-reform cost is clearly exogenous relative to the bankruptcy behavior in the post reform period, and it is significantly negatively related with the cost change, as shown in Table 5. The increase of the filing cost post-reform is strongly negatively related to the Chapter 7 bankruptcy filing rate in the post-reform period. Moving from the 25th to the 75th percentile of the post-reform attorney fee distribution for Chapter 7 bankruptcy reduces the transition from a new insolvency to Chapter 7 filing by 21 log points for the

IV specification. Additionally, the transition into Chapter 7 filing is significantly positively related to the change in unemployment, and significantly negatively related to the change home price index for both specifications.

Table 4: Exogeneity of Chapter 7 attorney fees and their BAPCPA related change

Panel I: Economic Indicators				
	Income	Unemployment	HPI	
Filing Cost Post	0.43 (3.38)	-0.02 (0.18)	0.64 (2.93)	
R squared	0.11	0	0.08	
Log Change	-0.03 (0.31)	-0.04 (0.53)	-0.08 (0.44)	
R squared	0	0	0	
N	89	89	85	
Panel II: Regulatory Variables				
	Homestead	Garnishment	Recourse	Judicial
Att. Fee Post	0.04 (2.64)	0.0002 (1.91)	-017 (2.96)	-0.04 (0.81)
R squared	0.08	0.04	0.09	0.008
Log Change	-0.005 (0.42)	-0.0002 (2.40)	-0.04 (0.93)	-0.12 (3.30)
R squared	0.002	0.06	0.01	0.11
N	89	89	89	89
Panel III: Prior Behavior				
	Bankruptcy	Foreclosure	Insolvency	
Att. Fee Post	- 0.01 (0.93)	-0.05 (0.76)	-0.008 (0.09)	
R squared	0.01	0.007	0	
Log Change	0.005 (0.46)	-0.003 (0.06)	-0.02 (0.28)	
R squared	0.002	0	0	
N	89	89	89	

Numbers in parentheses are the absolute values of t-statistics. Bankruptcy, Foreclosure and Insolvency are average pre-BAPCPA Chapter 7 filing rate, foreclosure rate and insolvency rate at the district level. Homestead and Garnishment are log homestead exemption and wage garnishment. Judicial and Recourse are indicators for judicial foreclosure state and recourse state. Income, Unemployment and HPI are district level pre-BAPCPA means of the logs of those variables. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

Table 5: First stage regression for IV estimation of the log attorney fee change

Attorney Fee Pre	-0.35 (5.07)
Regulation	No
F-stat	25.74
N	89

All observations are weighted by district level population. Standard errors are clustered at the district level. Absolute values of the t-statistics are reported in parentheses. We are dropping observations from 2005.Q1 to 2006.Q1 to exclude anticipation effects. We use the Craig-Donald-Wald F statistic to detect weak identification. Δ denotes 4 quarter changes. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

5.1 Chapter 13 Response

We now examine the response of Chapter 13 filings to BAPCPA. The reform increased bankruptcy filing costs for Chapter 13 bankrupts by 29% on average (see Table 2). However, Chapter 13 legal fees can be included in the debt that enters the repayment plan. As a result, Chapter 13 fees can be paid in installments during the discharge phase of the bankruptcy, while Chapter 7 fees have to be paid at filing in their entirety. If our hypothesis that the effects on bankruptcy filings are a direct consequence of the increase in cost through binding liquidity constraints is correct, we should see no statistical effects of Chapter 13 filing costs on filings. This is precisely what we find in our empirical analysis. Specifically, we estimate the specifications in Table 3 and 5, where we use the log attorney fees fees for Chapter 13 and log transitions from new insolvency to Chapter 13 filing. The results are presented in Table 6. There is no statistical relation between Chapter 13 filings and Chapter 13 attorney fees, either before or after the reform. This results confirms the small effects visualized in figure 3. It is worth noting that these result still mean that *in relative terms*, the economy exhibited a shift from Chapter 7 to Chapter 13 bankruptcy, but that the relative effect is driven by Chapter 7 transitions dropping.

Table 6: Transition from New Insolvency to Chapter 13 Bankruptcy: OLS and IV Estimates

Specification	(1)	(2)	(3)	(4)	(IV)
Ch.13 Att. Fee	-0.05 (0.28)				
Ch.13 Att. Fee Pre		-0.004 (0.02)	0.02 (0.08)		-0.01 (0.05)
Ch.13 Att. Fee Post		-0.08 (0.38)		-0.05 (0.25)	-0.21 (0.53)
Reform Dummy	0.08 (0.93)	0.71 (0.36)			1.63 (0.64)
R squared	0.29	0.29	0.36	0.29	0.29
N	1462	1462	462	1000	1462

The regressions include all the controls reported in table 3. The estimated coefficients for the controls are omitted for brevity. Footnotes from tables 3 apply. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

5.2 Regressions By Income

To further explore the role of liquidity constraints, we estimate our main regressions for imputed income above and below the state median. Specifically, we estimate equation (2) for individuals in these two categories separately. The goal of the exercise is twofold. First, since BAPCPA introduced an eligibility requirement for Chapter 7 bankruptcy, limiting it

to individuals with income below the state median adjusted for family size, we can assess whether this requirement influenced filing behavior. Based on this requirement, we should observe a drop in filing for individuals above the state median income. Additionally, we can assess whether the effects of the change in bankruptcy filing costs estimated in the overall population are more pronounced in the lowest income group, which would give additional support to the hypothesis that the change in filing costs are driving the responses to the bankruptcy reform.

Table 7 reports coefficients on costs for specifications (1)-(4) and (IV) from table 3. The estimates suggests that the effect of the bankruptcy filing cost is stronger for lower income individuals. For all specifications, including the instrumental variable regression, the coefficients are larger in absolute value for individuals below the state median income.

Table 7: Effects on Chapter 7 Filing: Income Above and Below the State Median

Below Median Income					
Specification	(1)	(2)	(3)	(4)	(IV)
Att. Fee	-0.42 (2.13)				
Att. Fee Pre		-0.39 (1.70)	-0.87 (3.61)		-0.54 (2.31)
Att. Fee Post		-0.46 (1.90)		-0.44 (2.01)	-0.88 (2.79)
R squared	0.39	0.39	0.29	0.27	0.41
N	1422	1422	566	856	1422
Above Median Income					
Specification	(1)	(2)	(3)	(4)	(IV)
Att. Fee	-0.29 (1.86)				
Att. Fee Pre		-0.09 (0.51)	-0.41 (2.38)		-0.16 (0.84)
Att. Fee Post		-0.48 (2.97)		-0.35 (2.18)	-0.63 (2.65)
R squared	0.36	0.37	0.16	0.26	0.36
N	2061	2061	725	1336	2061

The regressions include all the controls reported in Table 3. The estimated coefficients for the controls are omitted for brevity. Footnotes from tables 3 apply. Source: Authors' calculation based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

5.3 Substitution from Bankruptcy

Section 3 shows that the decline in the transition to bankruptcy associated with the reform was accompanied by a sizable rise in insolvency and foreclosure. In this section, we quantify the substitution effect using a regression approach that allows us to control for district-specific and overall economic conditions to isolate the impact of the reform. We continue to focus on the population of newly insolvent individuals, and compute the rate at which they transition into various states at a 4 and 8 quarter horizons. The states we are interested in are insolvency (without foreclosure), Chapter 7 and 13 bankruptcy filing (without foreclosure) and foreclosure.

Our analysis aims to capture the effect of within-district drop of flows to Chapter 7 bankruptcy on flows to other states post-reform. To that end, we adopt a two step procedure. We first obtain the average change in flows to bankruptcy, insolvency, foreclosure and current, driven by the reform, controlling for economic factors. Formally, we estimate:

$$y_{it} = \sum_i \beta_i I_{it}^{post} + \phi X_{it} + D_i + \varepsilon_{it}, \tag{5}$$

where I_{it}^{post} is a set of district-specific post-reform dummies, D_i are district 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 income, log house price index and the log unemployment rate. The output of interest from this step is the set of district dummies β_i, which capture the log change in average flows not explained by our other controls. Table 8 presents the distribution of the estimate mean effects of the reform across districts.

In the second step of our estimation procedure, we regress the district dummies for other outcome states, $\{\beta_i\}$ estimated in the first stage, on the district dummies estimated for flows into Chapter 7 bankruptcy filings:

$$\beta_i = \gamma_0 + \gamma_1 \beta_i^{ins \to bank7}.$$

The estimated coefficient γ_1 will capture the direction and statistical strength of the relation between the drop in flows to bankruptcy and the other flows of interest, after controlling for the impact of economic and regulatory controls on these flows.

We report the estimates for flows from newly insolvent to insolvency (without foreclosure) the other states in Table 9. At the 4 quarter horizon, the median estimated Chapter 7 bankruptcy transition drop (53%) increases the persistence of insolvency by 2.65% (the

Table 8: Mean Reform Dummy Estimation

Horizon	4 Quarters				
Percentile	50th	10th	25th	75th	90th
New Insolvency to Ch. 7 Bankruptcy	-0.53	-0.82	-0.69	-0.19	0.024
New Insolvency to Ch. 13 Bankruptcy	-0.055	-0.44	-0.30	0.19	0.44
New Insolvency to Foreclosure	0.33	-0.31	-0.015	0.64	0.94
New Insolvency to Insolvency	0.035	-0.078	-0.023	0.067	0.10
New Insolvency to Current	0.07	-0.017	0.02	0.16	0.22
Current to Current	0.008	-0.004	0.001	0.016	0.024
Horizon	8 Quarters				
Percentile	50th	10th	25th	75th	90th
New Insolvency to Ch. 7 Bankruptcy	-0.49	-0.72	-0.63	-0.26	-0.076
New Insolvency to Ch. 13 Bankruptcy	0.02	-0.44	-0.19	0.25	0.40
New Insolvency to Foreclosure	0.38	-0.40	0.06	0.66	0.85
New Insolvency to Insolvency	-0.03	-0.19	-0.10	0.015	0.06
New Insolvency to Current	0.11	0.007	0.06	0.16	0.22
Current to Current	0.01	-0.008	-0.0015	0.024	0.04

Source: Authors' calculations based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

median increase is 3.5%). Shifting from the 10th to the 90th percentile of the Chapter 7 bankruptcy transition distribution (85 log points drop) results in an change of the increase of the persistence of insolvency by an additional 4.24%. For the flows to foreclosure, the results are much more dramatic. At the 4 quarter horizon, the median drop in flows into bankruptcy results in a 27.5% percent increase in flows into foreclosure (compared to a median estimated increase of these flows of 33%). There is no evidence that the law had any effect on transitions to current in the short or long run. The last panel of table 9 presents the substitution from Chapter 7 to Chapter 13 bankruptcy after the introduction of the reform. Even though the new law's primary stated objectives was to channel individuals to Chapter 13 from Chapter 7, we see no statistical evidence of such effects.

As for the effects of Chapter 13, for almost all outcomes, they are statistically insignificant. One notable exception are flows to foreclosure at the 4 quarter horizon and insolvency at the 8 quarter horizon. For the median predicted drop in Chapter 13 filings of 5%, the implied increase of flows into foreclosure are an additional 1% increase over the effect of Chapter 7. For flows into insolvency at the 8 quarter horizon, the median effect is a 0.2%

Table 9: Effects of the Reform: Substitution from Bankruptcy

Horizon	4Q	8Q
	Flow to Insolvency	
Flow to Ch. 7 Bankruptcy	-0.05 (2.20)	-0.06 (3.19)
Flow to Ch. 13 Bankruptcy	-0.016 (0.82)	0.04 (1.81)
R^2	0.05	0.10
	Flow to Foreclosure	
Flow to Ch. 7 Bankruptcy	-0.52 (5.73)	-0.60 (4.62)
Flow to Ch. 13 Bankruptcy	-0.20 (1.93)	-0.14 (1.33)
R^2	0.47	0.23
	Flow to Current	
Flow to Ch. 7 Bankruptcy	0.045 (1.55)	0.001 (0.04)
Flow to Ch. 13 Bankruptcy	0.035 (1.07)	0.005 (0.25)
R^2	0.026	n.a.
	Flow to Chapter 13	
Flow to Ch. 7 Bankruptcy	-0.08 (0.72)	0.05 (0.46)
R^2	n.a.	n.a.

The estimates are obtained using robust regression to control for the effects of outliers. Horizon denotes the horizon of the outcome variable–flows to Chapter 7 bankruptcy are kept at the 4 quarter horizon. Source: Authors' calculations based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

drop, far too small to counteract the 2.65% increase implied by the drop in flows to Chapter 7 filing. The opposite sign of the predicted effect in this case is interesting, suggesting that the full discharge offered by Chapter 7 has a much bigger effect on future insolvency than the partial discharge offered by the Chapter 13 repayment plan.

Substitution from initial state Current We also provide evidence on the flows conditional on individuals being initially Current, that is on time on all accounts with 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 deterrent to delinquent behavior. Table 10 reports the analog of the analysis in the previous paragraph for this initial state. There is no evidence that the persistence of the current state was affected by the changes in Chapter 7 or 13 bankruptcy flows at the 4 quarter horizon. For 8 quarter horizon, substitution from both chapters is more statistically

significant, with a median drop in Chapter 7 flows implying an increase of the persistence of the Current state of about 0.53%, relative to the median predicted increase in persistence of 1%. The effects of Chapter 13 drop predict a modest extra increase of 0.04%.

Table 10: Evidence on the effects of the reform: Substitution from Bankruptcy.

Horizon	4Q	8Q
	Current to Current	
Flow to Ch. 7 Bankruptcy	0.004 (1.19)	0.01 (1.66)
Flow to Ch. 13 Bankruptcy	0.004 (1.53)	0.008 (1.65)
R^2	0.028	0.05

The estimates are obtained using robust regression to control for the effects of outliers. Horizon denotes the horizon of the outcome variable–flows to bankruptcy are kept at the 4 quarter horizon. Source: Authors' calculations based on Federal Reserve Bank of New York's Consumer Credit Panel/Equifax Data.

6 Insolvency, Bankruptcy and Access to Credit

Our analysis shows a sizable substitution from bankruptcy to insolvency without foreclosure and to foreclosure, and a rise of the persistence of insolvency without foreclosure. We now compare Chapter 7 and Chapter 13 bankruptcy with insolvency without bankruptcy from the standpoint of access to new lines of credit and credit scores.

In each quarter, we focus on the individuals who become newly insolvent in that quarter (that is those who show a new insolvency on any type of debt after 8 quarters without insolvencies, bankruptcies or foreclosures). Within this group, we then distinguish between individuals who do not file for bankruptcy in the 8 quarters after the new insolvency, and those who file for Chapter 7 bankruptcy or Chapter 13 bankruptcy.

We first examine the differences in access to credit. Figure 7 displays the fraction of individuals with at least one new unsecured line of credit, auto loans or mortgages opened in the last year, four quarters after the new insolvency for those who don't file for bankruptcy in the next 8 quarters or 4 quarters after filing for bankruptcy for those who do.[25] Clearly, individuals who file for Chapter 7 bankruptcy are more successful opening new unsecured lines of credit and obtaining auto loans 4 quarters after filing, relative to individuals who become newly insolvent in the same quarter but do not file for bankruptcy in the next 8

[25]The individuals who file for bankruptcy mostly do so 2-6 quarters after experiencing the new insolvency.

quarters. Except at the height of the Great Recession, Chapter 7 filers have an approximately 30% higher probability of displaying a new unsecured origination relative to individuals who don't file, and a 60% higher probability of obtaining a new auto origination 4 quarters after filing, when compared to individuals who do not file 4 quarters after the new insolvency. On these two items, Chapter 7 filers are also considerably more successful that individuals who become newly insolvent in the same quarter and file for Chapter 13 bankruptcy in the next 8 quarters. Indeed Chapter 13 filers display a similar fraction of new unsecured and auto originations as individuals who become newly insolvent in the same quarter and do not file for bankruptcy, when compared 4 quarters after filing and 4 quarters after the new insolvency for individuals who do not file, respectively. Similar results hold for the 8 quarter horizon (not reported). For mortgage originations, individuals who file for bankruptcy in the 8 quarters after a new insolvency are more successful at obtaining a new mortgage than individuals who don't file and became insolvent in the same quarter. However, those who file for Chapter 13 bankruptcy obtain new mortgages at higher rates than Chapter 7 filers, especially after 2005. At the 4 quarter horizon, before 2005, the probability of obtaining a new mortgage for bankruptcy filers of either chapter was approximately 50% higher than for individuals who become newly insolvent in the same quarter but do not file for bankruptcy. After 2005, it is approximately double for Chapter 7 filers, relative to non filers, and for times as larger for Chapter 13 filers relative to non filers, at the 4 quarter horizon. Similar results hold for the 8 quarter horizon (not reported).[26]

Figure 8 reports the fraction of individuals with inquiries among these three groups, also 4 quarters after a new insolvency for individuals who do not file for bankruptcy, or four quarters after filing for those who do file. We interpret inquiries as an indicator of credit demand, as an inquiry is registered in the credit report when an individual initiates a new credit application. There is very little difference in the fraction of individuals with inquiries based on filing status at a 4 quarter horizon, and similar results hold for the 8 quarter horizon (not reported). This suggests that the difference by filing status in the fraction of individuals who open new lines of unsecured, auto and mortgage credit is not driven by differences in demand for such credit, but in supply.[27]

[26]The higher rate of mortgage originations for Chapter 13 filers relative to Chapter 7 filers after 2005 may be due to the fact that, after the income eligibility requirement was introduced for Chapter 7 bankruptcy by BAPCPA, the pool of Chapter 13 filers has higher average income, thus making it easier for them to obtain mortgage credit.

[27]These results are consistent with Jagtiani and Li (2014), who study credit access after Chapter 7 and Chapter 13 bankruptcy in detail. Specifically, Jagtiani and Li (2014) find that Chapter 13 filers are much less likely to receive new credit cards than Chapter 7 filers, even after controlling for borrower characteristics and local economic environment. They also find that Chapter 13 filers end up with a slightly larger credit

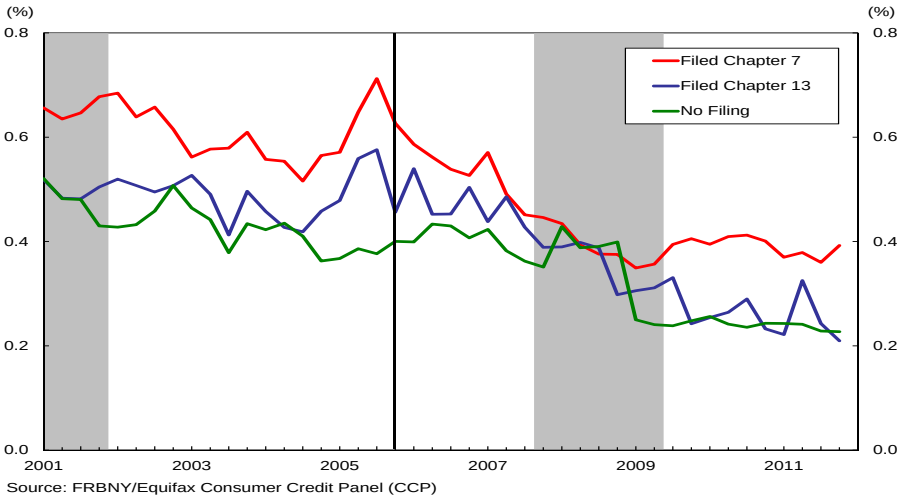
To conclude, we examine credit scores, since they are used as a proxy for creditworthiness by most lenders. Figure 9 (top panel) compares credit scores for the newly insolvents conditional on whether they go bankrupt in the next 8 quarters. At insolvency, those who will go bankrupt display a *lower* credit score, irrespective of the filing chapter, 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 9 (bottom panel) compares credit scores for the individuals who become newly insolvent who do not go bankrupt in the next 8 quarters, and individuals who go bankrupt in the next 8 quarters quarter. The credit score for non-filers recovers with the age of the insolvency, and is approximately 50 points higher 8 quarters after the new insolvency than 4 quarters after. However, both 4 quarters and 8 quarters after the new insolvency, non-filers display a much lower credit score than Chapter 7 filers 4 quarters after filing, despite the fact that Chapter 7 filers have lower credit scores at the time of the new insolvency. Instead, the credit score for Chapter 13 filers 4 quarters after filing is very similar to the score for newly insolvents 4 quarters after filing until the beginning of the Great Recession, after which it is very close to the credit score for non-filers 8 quarters after the new insolvency. The credit score advantage for Chapter 7 filers relative to non-filers and Chapter 13 filers rises after BAPCPA, 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.

These findings suggest that bankruptcy offers relief from financial distress, not only because it provides debt discharge and automatically stays collections, foreclosures, wage garnishment and other court actions against the filer, but also because it allows filers more access to new lines of credit, than remaining insolvent without filing. Additionally, our results show that Chapter 7 offers the most effective relief and is clearly a better outcome than insolvency for most filers. Moreover, the fact that we show evidence of liquidity constraints restricting access to Chapter 7 bankruptcy for potential filers contradicts the notion in Ausubel and Dawsey (2004) that marginal households would be indifferent between bankruptcy and insolvency.

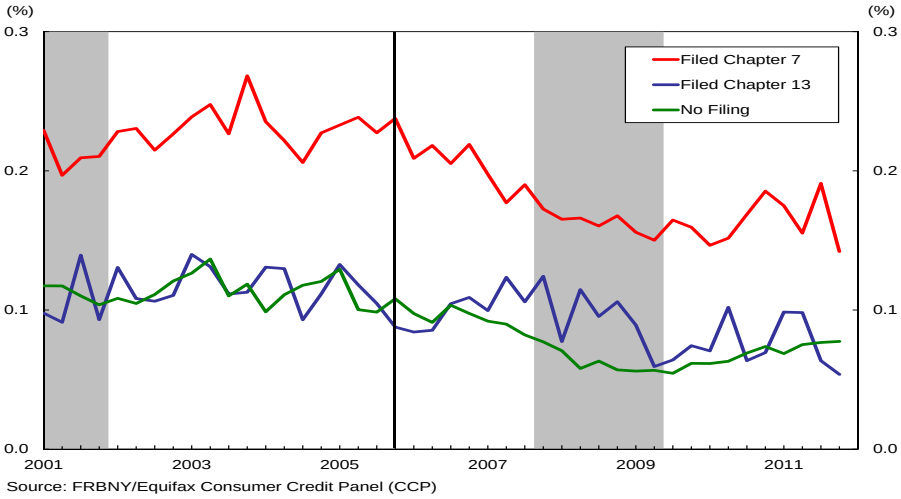
limit amount than Chapter 7 filers overall, because they are able to maintain more of their old credit from before bankruptcy filing. Chapter 13 filers may be at a disadvantage given their substantial recidivism in delinquency. As shown in Norberg and Velkey (2007) and Eraslan et al. (2014), only 33% of all Chapter 13 filers successfully complete the court mandated repayment plan. Moreover, 30-33% of Chapter 13 filers whose bankruptcy was discharged or dismissed filed again at least once. Even for those who emerged successfully from their cases through discharge, the refiling rate exceeds 20%.

Our results clearly contradict the widely held view that bankruptcy is associated with exclusion from credit markets. This view is incorporated in virtually all models of personal bankruptcy.[28] Based on our findings, realistic models of household credit should include both an informal default, associated with no debt relief and curtailed access to credit, and formal bankruptcy, associated with both debt relief and access to credit. They should also incorporate monetary costs of filing for bankruptcy and liquidity constraints. This additional richness will allow these models to offer a more adequate assessment of the welfare implications of incomplete insurance, as well as the consequences of policies introduced to ameliorate this incompleteness.

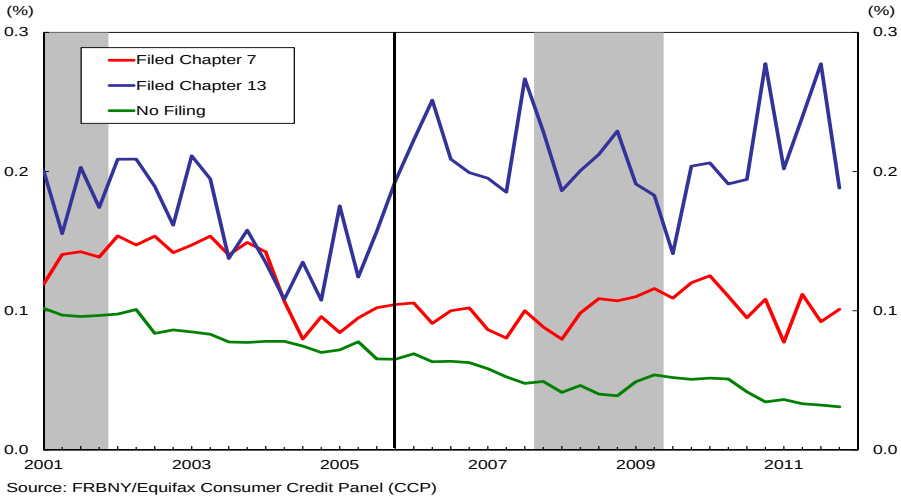
[28]See, for example, Chatterjee et al. (2007) and Livshits, MacGee, and Tertilt (2007).



New unsecured lines of credit 4Q after new insolvency or bankruptcy filing



New auto lines of credit 4Q after new insolvency or bankruptcy filing



New mortgages 4Q after new insolvency or bankruptcy filing

Figure 7: Fraction of individuals who become newly insolvent in each quarter that open a new line of unsecured, auto or mortgage credit in the 4 quarters after the new insolvency, , if they don't file for bankruptcy in the next 8 quarters, and in the 4 quarters after filing for bankruptcy, by chapter, if they file.

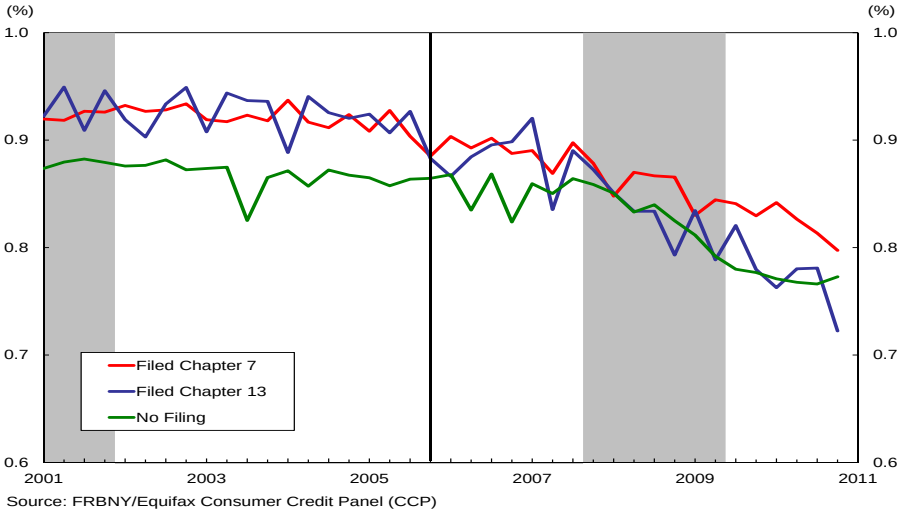
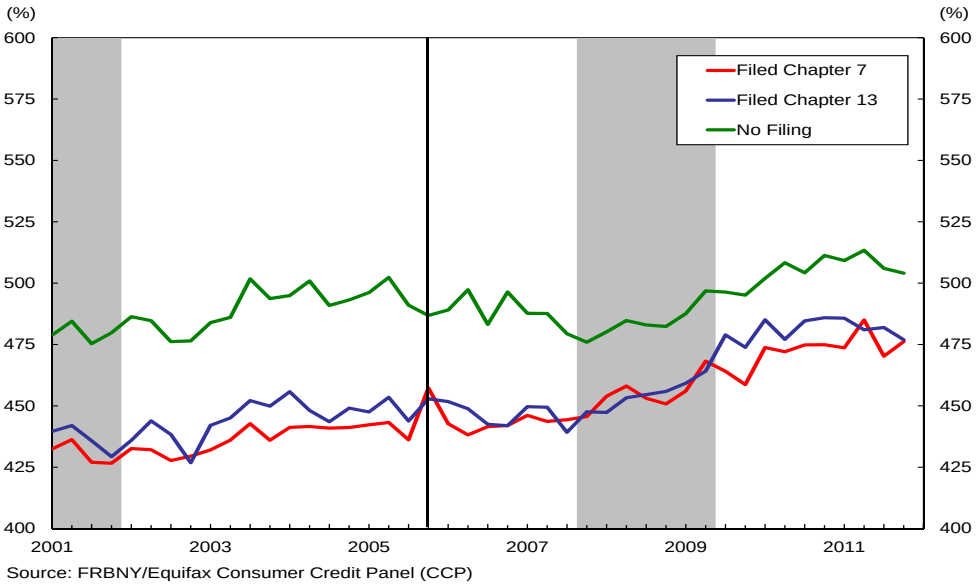
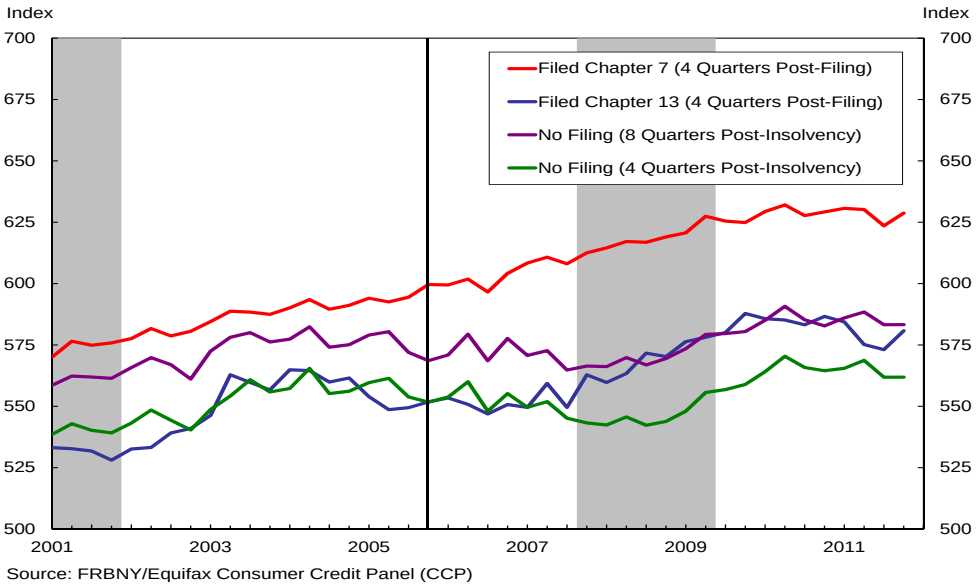


Figure 8: Fraction of individuals who become newly insolvent in each quarter that register a new inquiry in the 4 quarters after the new insolvency, if they don't file for bankruptcy in the next 8 quarters, and in the 4 quarters after filing for bankruptcy, by chapter, if they file.



Credit score at new insolvency



Credit score 4Q and 8Q after the new insolvency for non-filers, and 8Q after filing by chapter

Figure 9: Credit score for individuals who become newly insolvent in each quarter, if they don't file for bankruptcy in the next 8 quarters, and by chapter, if they file.

7 Conclusion

One of the main goals of personal bankruptcy is to provide incentive compatible insurance against unplanned loss of income or large expenditure shocks. Our finding that bankruptcy filings have declined mostly for low income, possibly liquidity constrained individuals, resulting in a substantial rise in the rate and persistence of insolvency, suggests that BAPCPA may have eliminated access to this form of insurance for these households. It also suggests that the income means test that was introduced to ameliorate possible moral hazard associated with Chapter 7 bankruptcy was not effective. Further, the fact that the decline in bankruptcy filings was associated with a rise in the foreclosure rate implies that formal default on unsecured debt has been replaced by default on secured debt, possibly exacerbating the 2007-09 housing crisis.

We also show that insolvency is associated with a high degree of financial distress in comparison to bankruptcy, suggesting that insolvency would not be the preferred choice for most individuals, contrary to the notion proposed in Ausubel and Dawsey (2004). This consequence of BAPCPA is potentially welfare reducing for households. However, since the recovery rates for creditors from insolvent loans should be higher than on bankrupt loans, this could have induced banks and credit card companies to expand access and improve conditions for personal loans. Simkovic (2009) finds that BAPCPA reduced credit card company losses and increased their profits. However, he finds 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 Chapter 7 bankruptcy to insolvency and foreclosure.

References

Athreya, Kartik B. 2002. "Welfare implications of the bankruptcy reform act of 1999." *Journal of Monetary Economics* 49 (8): 1567–1595.

Ausubel, Lawrence, and Amanda Dawsey. 2004. "Informal bankruptcy." *Work. Pap., Dep. Econ., Univ. Maryland.*

Carroll, Sarah W, and Wenli Li. 2011. "The homeownership experience of households in bankruptcy." *Cityscape*, pp. 113–134.

Chatterjee, Satyajit, Dean Corbae, Makoto Nakajima, and José-Víctor Ríos-Rull. 2007. "A Quantitative Theory of Unsecured Consumer Credit with Risk of Default." *Econometrica* 75 (6): 1525–1589.

Dobbie, Will, and Paul Goldsmith-Pinkham. 2014. Debtor Protections and the Great Recession.

Dobbie, Will, Paul Goldsmith-Pinkham, and Crystal Yang. 2015. "Consumer Bankruptcy and Financial Health." Technical Report, National Bureau of Economic Research.

Dobbie, Will, and Jae Song. 2015. "Debt Relief and Debtor Outcomes: Measuring the Effects of Consumer Bankruptcy Protection." *American Economic Review* 105 (3): 1272–1311.

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.

Eraslan, Hulya, Gizem Kosar, Wenli Li, and Pierre-Daniel G Sarte. 2014. "An anatomy of us Personal bankruptcy under chapter 13."

Fay, Scott, Erik Hurst, and Michelle J White. 2002. "The household bankruptcy decision." *American Economic Review* 92 (3): 706–718.

Grochulski, Borys. 2010. "Optimal personal bankruptcy design under moral hazard." *Review of Economic Dynamics* 13 (2): 350–378.

Gross, David B, and Nicholas S Souleles. 2002a. "Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data." *The Quarterly Journal of Economics* 117 (1): 149–185.

———. 2002b. "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.

Han, Song, and Geng Li. 2011. "Household borrowing after personal bankruptcy." *Journal of Money, Credit and Banking* 43 (2-3): 491–517.

Hynes, Richard M, Amanda E Dawsey, and Lawrence M Ausubel. 2009. "The Regulation of Non-Judicial Debt Collection and the Consumer's Choice among Repayment, Bankruptcy and Informal Bankruptcy." *Virginia Law and Economics Research Paper*, no. 2009-13.

Jagtiani, Julapa, and Wenli Li. 2014. "Credit access after consumer bankruptcy filing: new evidence."

Johnson, David S, Jonathan A Parker, and Nicholas S Souleles. 2006. "Household Expenditure and the Income Tax Rebates of 2001." *The American Economic Review*, pp. 1589–1610.

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.

Li, Wenli. 2009. "Residential housing and personal bankruptcy." *Business Review Q* 2:19–29.

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. 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.

Mian, Atif, Amir Sufi, and Francesco Trebbi. 2011. "Foreclosures, house prices, and the real economy." Technical Report, National Bureau of Economic Research.

Morgan, Donald P, Benjamin Charles Iverson, and Matthew J Botsch. 2012. "Subprime foreclosures and the 2005 bankruptcy reform." *Economic Policy Review, March*.

Morgan, Donald P, and Michael R Strain. 2007. "Staff Reports."

Norberg, Scott, and Andrew Velkey. 2007. "What Do We Know About Chapter 13 Personal Bankruptcy Filings?" *manuscript*.

Parker, Jonathan A, Nicholas S Souleles, David S Johnson, and Robert McClelland. 2013. "Consumer Spending and the Economic Stimulus Payments of 2008." *The American Economic Review* 103 (6): 2530–2553.

Sullivan, Teresa A, Elizabeth Warren, and Jay Lawrence Westbrook. 1994. "Consumer debtors ten years later: A financial comparison of consumer bankrupts 1981-1991." *Am. Bankr. LJ* 68:121.

———. 2006. "Less stigma or more financial distress: An empirical analysis of the extraordinary increase in bankruptcy filings." *Stanford Law Review*, pp. 213–256.

Townsend, Robert M. 1979. "Optimal contracts and competitive markets with costly state verification." *Journal of Economic theory* 21 (2): 265–293.

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

White, Michelle J, and Ning Zhu. 2008. "Saving Your Home in Bankruptcy."

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

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 Statisticss (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 estiamted 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).

Table 11: Income Distribution Comparison by Quintile

Calculation	Dataset	1	2	3	4	5
Mean	CPS	11058.67	24791.32	36584.61	51872.45	110192.2
	TALX	17078.07	26565.46	39589.76	58510.22	117260.1
Median	CPS	12000	25000	36000	50000	85000
	TALX	16640	27040	39520	57512	99990

Source: IPUMS, TALX. TALX income calculations made using proxied income from pay periods and pay rate. CPS income calculations made using total wage and salary income.

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 Income Data and Imputation

In this section, we describe the supplementary payroll data used for the income imputation procedure. This data is merged with our credit panel data, allowing us to map individuals' incomes for 2009 to their credit files.

The TALX Work Number dataset provided by Equifax is a nationally-representative random sample of individuals containing employment and payroll verification information provided directly from the employer organizations. 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.

Income Measure Description There are various income measures provided in the TALX dataset. For each year of data available variables are given for the total 12-month base, bonus, overtime, and commission compensation in year t, $t-1$, and $t-2$. This information however is only available for a little over $\frac{1}{3}$ of the sample. The other measure of income, which is widely available across the sample, is rate of pay and pay frequency. We therefore impute total income using a simple *rate* $\times$ *frequency* approach to account for the lack of representation found in the sample regarding the total 12-month income variables. This yields about 11,000 observations for 2009. The sample of records is nationally representative, both in terms of geographical and age distribution.

Comparison with the CPS To gauge the accuracy of the imputed income measure in our data, we performed a simple comparison with the income levels reported in the Consumer Population Survey. We present results based on income quintiles below.

B.1 Imputation Procedure

A key component of the 2005 Bankruptcy Reform Act was to restrict filings for Chapter 7 bankruptcies to only those individuals with family-adjusted annual income below that of the median income in their filing state. Making use of the income measure previously derived and the median family-adjusted state income provided by the Census Bureau, we assign individuals as above/below- the state-level median income.

We then calculate various measures of debt, including but not limited to total aggregate debt, auto debt, secured debt, unsecured debt, and total home debt for time period t. For each category of debt, quintiles are derived conditional on having an amount of debt greater than 0 in that category. In other words, all individuals with non-zero and positive type of debt d_t are assigned to a debt quintile $q_{d,t}$, with 20% of individuals in each quintile. Individuals with $d_t = 0$ are assigned a value of $q_{d,t} = 0$. They are therefore not excluded from the sample, but the regressional affect of being in a given quintile thus does not apply to them.

Regressions are next performed for each individual i in year $t = 2009$ predicting whether the individual's annual income is above/below- state-level median income ($y_{i,t}$) based on various independent variables $x_{i,t}$. The vector x_i includes the following variables:

- Homeowner status (binary variable coding whether individual i reports some real estate debt in the last 4 quarters)
- Age
- Age Squared
- Total Secured Debt Quintile
- High Credit Limit Quintile
- IRS County-level Average Income

Upon methodologically-equivalent construction of quintiles for the variables of interest in the Equifax Consumer Credit Panel (CCP), the coefficients from the above regression were merged in and predicted income was generated by applying the coefficients to the independent variables. For each time period t in the CCP sample, individuals were then assigned to belonging to either above or below the state-level median by imposing the restriction that 50% of individuals in a given state must be belong to the below-median group. Through this process, predicted above/below- the state-level median income was assigned quarterly to CCP individuals for the years 2001Q1-2013Q4. We use debt quintiles instead of levels to minimize the effects of trend growth in debt during the sample period on the income imputation.

In-sample Verification To assess the accuracy of the regression we present a simple 2×2 matrix detailing the in-sample accuracy averaged across all states:

Table 12: Regression Accuracy

	Reported Below	ReportedAbove
Predicted Below	.395682	.1044825
Predicted Above	.1828039	.3105448

Source: TALX

C Geographical Variation in Attorney Fees

Figure 10 presents the pre- and post- reform levels of attorney fees for Chapter 7 bankruptcy by district, as well as the percentage change in these costs associated with the reform.

Figure 11 presents the pre- and post- reform levels of attorney fees for Chapter 7 bankruptcy by district, as well as the percentage change in these costs associated with the reform.

High Chapter 7 attorney fees are concentrated in the North and South East, the Gulf districts, and in California and New Mexico. Most of these districts also exhibit high attorney fees post-reform. The biggest percentage increases in attorney fees occur for some of the districts with the lowest pre-reform fees, however, the ranking of districts by Chapter 7 attorney fees is stable pre- and post-reform. The correlation between the pre- and post-reform ranking of these fees is 75%.

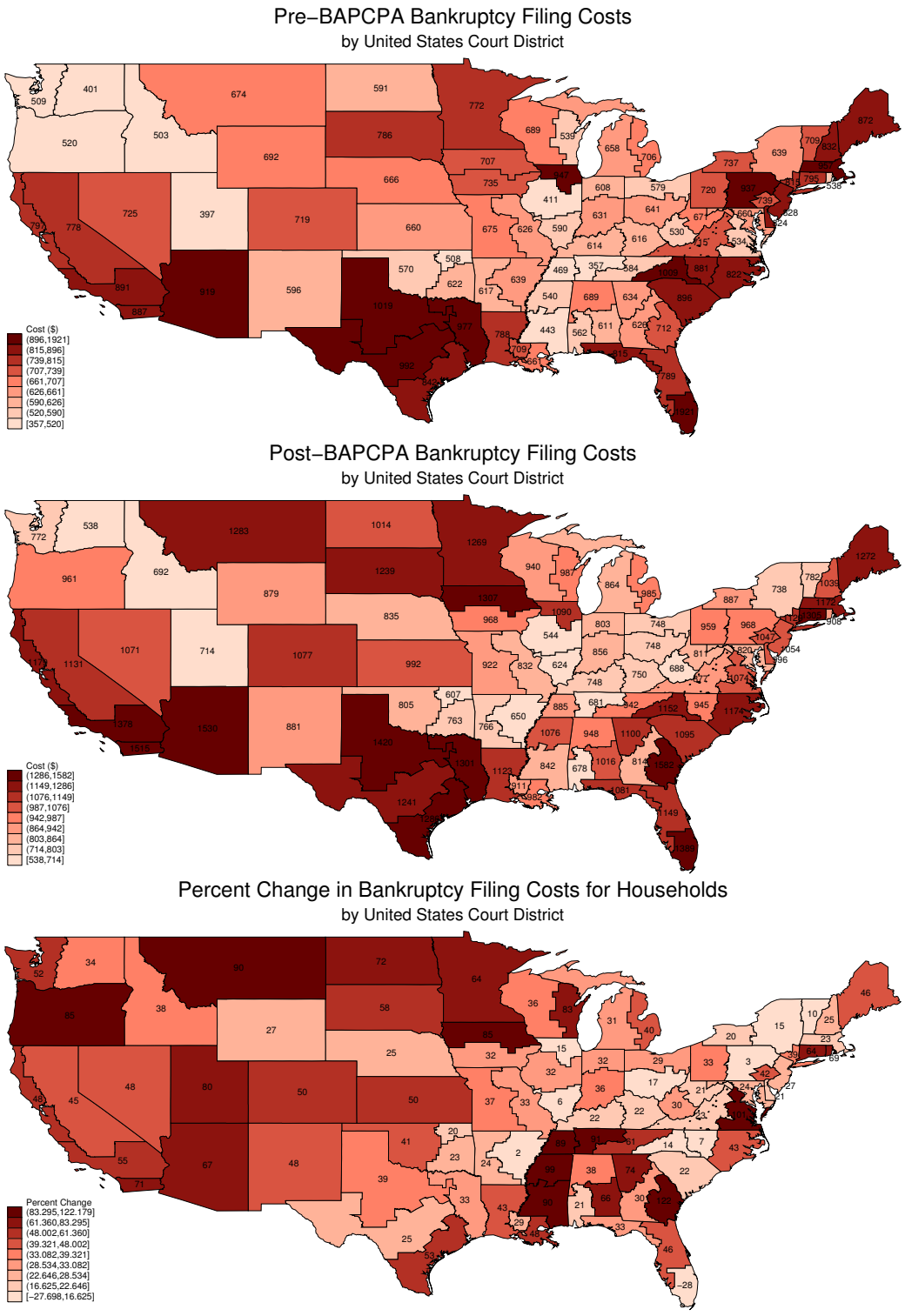
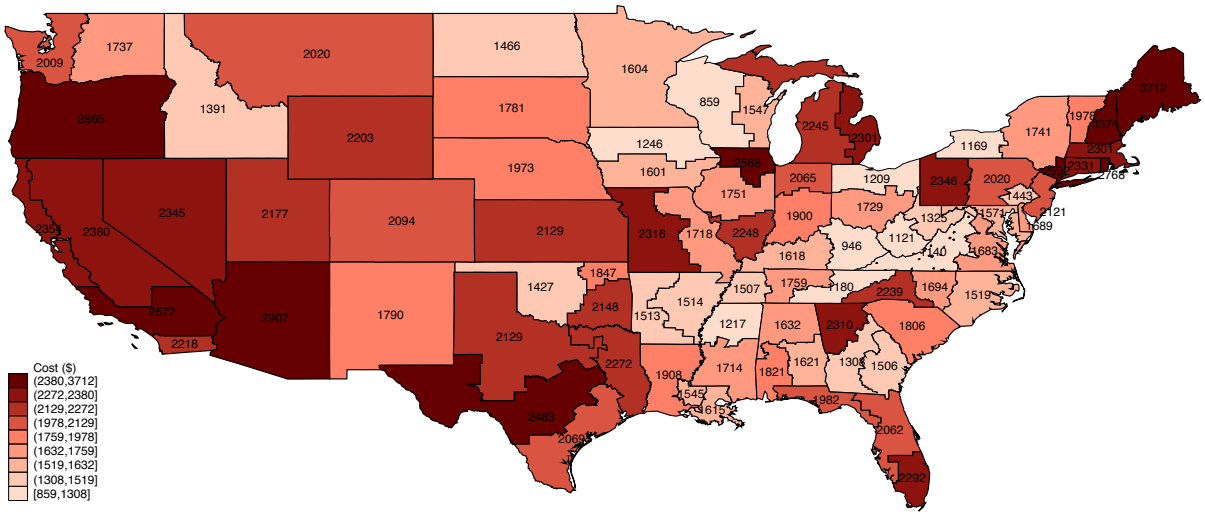


Figure 10: Attorney fees for Chapter 7 bankruptcy by district, pre- and post- reform, and percentage change associated with the reform.

Pre–BAPCPA Ch. 13 Bankruptcy Filing Costs

by United States Court District



Post–BAPCPA Ch. 13 Bankruptcy Filing Costs

by United States Court District