

Personal Bankruptcy Decisions Before and After Bankruptcy Reform

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Abstract

We examine the personal bankruptcy decisions of lower-income homeowners before and after the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005. Econometric studies suggest that personal bankruptcy is explained by financial gain rather than adverse events, but data constraints have hindered tests of the adverse events hypothesis. Using household level panel data and controlling for the financial benefit of filing, we find that stressors related to cash flow, unexpected expenses, unemployment, health insurance coverage, medical bills, and mortgage delinquencies predict bankruptcy filings a year later. At the federal level, BAPCPA explains a decrease in filings over time in counties that experienced lower filing rates.

Personal Bankruptcy Decisions of Lower-Income Homeowners

Personal bankruptcy filings increased five-fold from 1980 through October 2005, when the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), the most dramatic change to federal bankruptcy law since 1978, took effect and made filing for bankruptcy more difficult. Although personal bankruptcies dropped following BAPCPA's passage, filings have risen with the housing downturn in 2006, the financial crisis of 2008, and tepid economic conditions through 2010. To restore economic stability, particularly to housing markets that continue to reel, many experts recommend that personal bankruptcy laws undergo further reform. More narrowly, proponents of bankruptcy reform recommend a change in the law to allow the restructuring of the mortgage of primary residences during bankruptcy proceedings as the most effective way to deal with a fundamental fact that continues to weaken the recovery: one quarter of all homeowners with mortgages owes more than their house is worth. Such a change to federal bankruptcy law may particularly benefit low and moderate income and minority homeowners with subprime mortgages, a group that has been disproportionately affected by the foreclosure crisis. But critics contend that restructuring mortgages through bankruptcy will result in a flood of bankruptcy filings from homeowners who are simply trying to gain a financial advantage.

There is some empirical justification to this concern. In a pioneering study, Scott Fay, Erik Hurst and Michelle J. White (2002) analyzed bankruptcy in the general population and found that a measure of financial gain they developed (the financial benefit of filing) explained household bankruptcy decisions. More specifically, Fay, Hurst and White found that a \$1,000 increase in the financial gain from filing would raise the number of personal bankruptcies by 7%. Their study made use of the 1996 Panel Survey of Income Dynamics (PSID), which was the first household-level data set to include information on bankruptcy filings. The PSID contained measures of life events and household wealth over time and supplied an essential feature: a comparison group of non-filers. Other researchers took advantage of these data attributes and produced a series of bankruptcy studies that provide a modern foundation for understanding the household causes and consequences of personal bankruptcy. This contribution matters because the PSID bankruptcy measure has a limitation: whether or not a household filed for bankruptcy

was asked retrospectively in 1996 rather than annually.² Thus, if a filer did not complete the 1996 survey, their bankruptcy was not captured. In fact, there is good reason to suspect that the PSID underestimates bankruptcies. The bankruptcy rate in the PSID is about half the national rate and it is much lower in the 1980's than in the 1990's (Filer II and Fisher 2005; Fisher 2005). This pattern suggests that many bankruptcy filings were not captured due to panel attrition during or prior to the 1996 survey administration. A second concern with the PSID bankruptcy data is that measurement error resulted from a follow-up question which asked bankruptcy filers to identify the year that they filed. In particular, analysts of the PSID bankruptcy data have raised concerns that "households are more likely to misreport the year they filed the earlier they filed" (Filer II and Fisher 2005, pg.841). Such bias in measurement error would affect PSID bankruptcy findings because the year identified by PSID filers was used to match the timing of their bankruptcy to measures of life events and household wealth that were captured during prior administrations of the survey.

We address these data constraints in our current study. Whereas the PSID measured bankruptcy retrospectively, the survey used in this study asks about filing behavior annually, thus reducing concerns about the effects of panel attrition on the measurement of bankruptcy and instilling greater confidence in how the timing of bankruptcy relates to life events. We make use of the Community Advantage Panel Survey (CAPS), a household level panel data set that contains comprehensive measures of life events, household wealth, and personal bankruptcy decisions. The CAPS data set comprises low-to-moderate income (LMI) households that compare favorably to a random national sample of LMI households who participated in the Current Population Survey. When compared to the PSID, the CAPS data set contains more Black, Hispanic, and female head of households. The greater share of minorities in the CAPS data set corresponds to ongoing demographic shifts in the U.S. population (The Economist 2011). We follow a sample of LMI homeowners that earned, on average, 65% of their area-median-income. Whereas Fay, Hurst, and White (2002) report that the bankruptcy rate of their 1984-95 PSID sample (.67 percent of households per year) was about half the national rate, our CAPS sample over the 2003-2009 study period has a higher average filing rate (1.88 percent of

²The PSID data asked respondents in 1996 whether they had ever filed for bankruptcy, and if so, in what year(s). Thus, a respondent who filed for bankruptcy in 1984 was not asked about the timing of that filing until 12 years later, in 1996.

households per year) when compared to the counties in which they reside (1.29 percent) and the national bankruptcy filing rate (1.23 percent).

The goal of our study is to assess whether lower-income households file for bankruptcy as a result of adverse life events such as unemployment and unexpected expenses. Adverse events present a sensible and straightforward reason for why a household might file for bankruptcy, but existing research suggests that alternate theories provide a better explanation. A large body of work does supply compelling reasons to posit that adverse events influence bankruptcy (Sullivan, Warren, and Westbrook 2000). A number of statistical analyses also point toward adverse events as a precursor to household bankruptcy. However, all of these studies either lack a comparison group or do not account for two alternate explanations identified by Fay, Hurst, & White: the financial benefit of filing and aggregate bankruptcy rates. Fay, Hurst, & White (2002) did specify adverse events as a third potential explanation, but they find that the adverse events they tested (unemployment, health problems, and divorce) did not explain personal bankruptcy.³ Similarly, Fisher (2006) found that that divorce no longer predicted bankruptcy after accounting for endogeneity.⁴ To date, then, empirical studies have yet to demonstrate, while controlling for the financial benefit of filing, that adverse life events affect household bankruptcy decisions.

We address the incongruence with this study. We control for the financial benefit of filing, aggregate bankruptcy rates, and a host of measures which assess bankruptcy filing risks for borrowers and their mortgages. We find evidence that, for lower income households, personal bankruptcy is explained by three adverse events: unexpected expenses that exceed \$500, spells of unemployment, and difficulty paying medical bills. We also find that personal bankruptcy is affected by mortgage delinquencies, a lack of health insurance coverage, and monthly cash flow as measured by a higher non-mortgage debt-to-income ratio. The effect of these stressors in context of other plausible explanations stands in contrast to prior work.

As a second contribution, our analysis identifies a smaller effect for the financial gain that typically results from filing for bankruptcy. Whereas Fay, Hurst, & White estimated models which predict that a \$1,000 increase in the financial benefit of filing would raise the number of

³ Fay, Hurst, & White report that divorce approached statistical significance, but they “find little support for the alternative hypothesis that households file for bankruptcy when adverse events occur” (pg. 716).

⁴ Fisher (2006) analyzed the PSID for years 1989-1995 while controlling for financial gain and aggregate bankruptcy rates and found a single equation effect for divorce on bankruptcy that diminished to statistical insignificance in a simultaneous probit model that jointly predicted divorce and bankruptcy.

filings by 7%, we project a much smaller, 2.15% increase. These estimates suggest that the role of financial benefit in motivating debtors to file for bankruptcy was more than 3 times stronger for the general population in 1984-95 than it was for LMI homeowners in 2003-09. The smaller financial benefit effect that we uncover may relate to our improved measurement of the bankruptcy decision or the greater role of adverse events in the filing decisions of lower income homeowners.

Our third contribution pertains to federal policy. The time period we study permits assessment of household filing behavior before and after BAPCPA. We find that passage of this federal bankruptcy law in 2005 interacted with aggregate bankruptcy rates. We measure aggregate bankruptcies contemporaneously and locally, at the county level, in contrast to the more distal, lagged state and court district levels analyzed in prior research. We find that the effect of county bankruptcy rates on the household filing decision depends on BAPCPA such that respondents were 20% more likely to file before BAPCPA took effect, given a county filing rate of 1%.

In the remainder of this paper, we provide an overview of federal and state laws that relate to personal bankruptcy. We then review empirical studies that predict bankruptcy and identify motives that might lead households to file. We describe our database of lower income homeowners and present an event history analysis for 2003-2009. We interpret how adverse events, financial gain, aggregate bankruptcy rates, and federal bankruptcy reform all influenced personal bankruptcy decisions in our sample of lower income homeowners. We conclude with policy recommendations and suggestions for future research.

Personal Bankruptcy Law and the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA)

Personal bankruptcy filings plummeted after BAPCPA took effect in October 2005. The number of personal bankruptcy filings per 1,000 population had risen from steadily from 1.26 per thousand in 1980 to 2.87 per thousand in 1990 and to 4.54 per thousand in 2000 (Jickling and Teefy 2010).⁵ The bankruptcy rate then peaked at 6.92 per thousand in 2005 as debtors rushed to

⁵ Jickling and Teefy (2010) report the number of filings per 1,000 population, whereas we follow Fay, Hurst and White and report the personal bankruptcy filing rate as a percentage of households.

file before BAPCPA took effect. After BAPCPA, in 2006, bankruptcy rates dropped to 1.98 per thousand. Since 2006, filings have risen steadily again to a rate of 4.53 per thousand in 2009.

One major change brought about by BAPCPA was an income-driven means test that requires the bankruptcy trustee to examine higher-income debtors and determine whether they can repay some of their debts with future earnings (Lawless et al. 2008; White 2009). We apply the income-driven means test to our study and find that 98% of our sample would pass below the means-test threshold.⁶ A second major change introduced by BAPCPA involved a new set of requirements for both debtors and bankruptcy lawyers.⁷ In response to the new requirements, bankruptcy lawyers raised their fees. According to estimates provided by the Government Accounting Agency, attorney fees increased by more than 50% as a result of BAPCPA (Jones 2008). This increase in attorney fees raised debtors' cost of filing for bankruptcy. We capture bankruptcy filing costs pre- and post-BAPCPA, and we apply them to our analysis.

In addition to reducing the overall rate of bankruptcy filings, BAPCPA was designed to steer more filers toward a bankruptcy option that requires them to repay their creditors. Personal bankruptcy law in the United States allows debtors to choose between a Chapter 7 or Chapter 13 filing, and Chapter 7 provides relief of unsecured debts, such as those from credit cards and medical bills, in exchange for the forfeiture of the debtors' non-exempt assets. In contrast, Chapter 13 requires a repayment plan under which debtors apply their future income toward repayment of their debts. A stated purpose of BAPCPA was to channel more debtors into Chapter 13 bankruptcy filings.

Federal law governs both Chapter 7 and Chapter 13 bankruptcy options but allows exemptions to be set at the state level. Personal property exemptions refer to basic necessities, such as food and clothing. Homestead exemptions identify the maximum amount of home equity that debtors who own property can protect from creditors. While personal property and homestead exemptions protect assets, wage garnishment exemptions protect income. Garnishing

⁶ We approximate the income driven means test with our annual data by comparing our respondents' income relative to their state median income. We also apply standard deductions for food, clothing, transportation, and housing, according to criteria identified in section 707 of the Bankruptcy Code.

⁷ For debtors, BAPCPA requires submission of past tax returns as well as completion of two financial counseling educational requirements: a credit counseling course before the debtor can file for bankruptcy and a financial management course before the case can be discharged. The debtor must pay for these courses in addition to attorney fees and the bankruptcy filing fee. The fees vary by counseling agency, but under the law, they must be "reasonable" and reduced or waived if the debtor is unable to pay. For lawyers, BAPCPA requires new registration and certification that debtors' information is accurate. BAPCPA also makes bankruptcy lawyers subject to audits.

wages is one way that creditors attempt to recoup debt, whereas filing for bankruptcy stops wage garnishment⁸. About a third of states exempt all wages from garnishment, and about a fifth of states allow between 0-25% of wages to be garnished. Roughly half of states defer to the exemption specified in the federal wage garnishment law, which allows 25% of wages to be garnished.⁹

Empirical Literature

Many researchers have observed that data limitations at the household level pervade studies of bankruptcy and hinder our understanding of why households file (Fay, Hurst, and White 2002; Kowalewski 2000; Li 2009; Lefgren and McIntyre 2009). Given household data limitations, bankruptcy studies typically examine aggregated rates of bankruptcy in a county or state, rather than tracking household level events and whether certain individuals in the study actually filed for bankruptcy. Of studies that do track individual filers, most lack a comparison group of non-filers. A few studies have examined actual bankruptcy filings at the household level while including a comparison group of non-filers and modeling changes over time, but all of these studies either use the 1996 PSID bankruptcy question or do not account for household wealth and life events. These shortcomings acknowledged, the review below covers empirical studies that shed light on the causes of filing for personal bankruptcy. These causes can be categorized as household-level factors, local conditions, and broader state, regional, and national policies and practices.

Household Characteristics

A number of researchers have studied whether people file for bankruptcy as a response to the financial illiquidity that accompanies unforeseen adverse events. Job loss and unemployment directly affect income but were non-significant in two studies that included a comparison group of non-filers (Domowitz and Sartain 1999; Fay, Hurst, and White 2002). Another study linked divorce to bankruptcy through a single equation model, but this effect became non-significant in a more rigorous, simultaneous equation specification that jointly predicted divorce and bankruptcy (Fisher 2005). Health problems did not predict bankruptcy in the Fay, Hurst, and

⁸ Filing stops wage garnishment for unsecured debts but not for child support or criminal restitution.

⁹ The federal wage garnishment exemption protects 75% of disposable earnings or 30 times the federal minimum wage.

White study, but other researchers have cited medical expenses as a key source of bankruptcy. Warren, Sullivan, and Jacoby (2000) found that one out of four filers identified medical problems as a reason for filing for bankruptcy. In a later study, Himmelstein et al. (2009) report that 62% of filings were medical bankruptcies using a composite definition. Most of these medical bankruptcies occurred among people who had health insurance. Using a nationally representative sample of bankruptcy filers, Jacoby and Holman (2010) report that 29% of filers specifically identify medical bills as a reason for bankruptcy. Domowitz and Sartain (1999) created a comparison group of non-filers and through multivariate analysis found similar results: medical debt had a stronger effect on bankruptcy filings than any other household variable. Medical expenses, unemployment, and divorce can transpire concurrently. Such adverse events may lead to income reductions, accumulated debt, and bill and mortgage delinquencies that presage a bankruptcy filing.

Other household factors have also been found to predict bankruptcy. Credit score data are not commonly available, but two studies found that higher credit scores were associated with a lower likelihood of filing for bankruptcy (Dawsey 2001; Gross and Souleles 2002).

In terms of demographic trends, Sullivan, Warren, and Westbrook (2000) emphasized that bankruptcy filers represent a cross section of society and that bankruptcy is common among homeowners. Multivariate models have found that less educated, younger, and White households are more likely to file (Fisher 2005, 2006). However, the general lack of household data has meant that demographic variables, and in particular, race and ethnicity, have not been well examined through statistical models.

A final consideration at the household level consists of the rationales that families use when deciding whether to file for bankruptcy. Fay, Hurst, & White (2002) find that debts play a larger role in bankruptcy than assets, and a simple but compelling view is that debtors focus primarily on their ability to pay bills. From this perspective, debtors place less emphasis on their assets and potential exemptions and instead confront their household's cash flow. Thus, a household's debt-to-income ratio may play a role in determining whether a household files for bankruptcy.

A more complex rationale is based on financial considerations such that households are more likely to file for bankruptcy as their net financial benefit from filing increases. From this perspective, households rationally consider whether to file for bankruptcy primarily according to

the financial costs and benefits of doing so. Fay, Hurst, & White (2002) constructed a financial benefit variable that accounted for three areas of household finance: a) the amount of unsecured debt that would be forgiven during bankruptcy, b) wealth and assets including secured debts such as mortgages and car loans, and c) exemptions afforded under bankruptcy, including vehicle equity, home equity, and personal property. Fay, Hurst, & White used the Panel Survey of Income Dynamics (PSID) to analyze data from 1984-1995. They found that households file for bankruptcy as their financial benefits from doing so increased.

Local Conditions

Local community conditions affect households, and several might impact the personal bankruptcy decision. Most notable is the local unemployment rate, which provides an indicator of local economic conditions and has been shown to increase the rate of bankruptcy filings (Edmiston 2006). A second factor is the bankruptcy filing rate within geographic areas. The filing rate within court districts has been found to increase filings among individuals (Fay, Hurst, and White 2002). Geographic variation in bankruptcy filing rates may reflect differences in the way bankruptcy law is administered or could serve as a proxy for the stigma of bankruptcy. Many bankruptcy studies incorporate additional local measures such as the county's divorce rate or the percentage of minorities, but these variables typically enter analyses as proxies when household level data is not available.

Policy Levers

Bankruptcy rates vary widely by region, state, and federal judicial districts¹⁰, and reasons for this geographic variation are not well understood. As previously noted, two state-level policies that might explain bankruptcy are wage garnishment and homestead exemptions (Dawsey 2001; Edmiston 2006). Residents in states with lower exemptions would seem more likely to file for bankruptcy in order to stop wage garnishment. This pattern was confirmed in research by Edmiston (2006), who found that the rate of bankruptcy increased as wage garnishment exemptions decreased. Similarly, Lefgren and McIntyre (2009) analyzed state differences in bankruptcy filing rates using zip-code level data and found that states with lower wage garnishment exemptions had higher rates of bankruptcy filings.

¹⁰ There are 94 federal judicial districts, including at least one district in each state. Bankruptcy courts are separate units of the district courts. Federal courts have exclusive jurisdiction over bankruptcy cases.

Higher homestead exemptions protect more assets and thus provide more financial benefit when filing. Consequently, states with higher or unlimited homestead exemptions would be expected to have higher rates of bankruptcy filings. One study found that exemption levels explained little of the state variation in bankruptcy rates (Lefgren and McIntyre 2009). Another study reported that higher homestead exemptions do increase state bankruptcy filing rates (Edmiston 2006).

Bankruptcy Filing Motives

Studies of bankruptcy filers suggest that some debtors file for bankruptcy to address cash flow difficulties that have resulted from expenses related to unforeseen adverse life events such as medical problems. However, because these studies lack a comparison group of non-filers, they do not provide a rigorous test of causal inference. Only the Domowitz and Sartain (1999) study analyzed the effect of medical expenses with a comparison group of non-filers, and their models do not account for a key explanation that has received empirical support: the financial gain that typically results from filing for bankruptcy (Fay, Hurst, and White 2002). The financial gain perspective presumes that debtors approach their insolvency by considering how their debts and income relate to their assets and exemptions, and file when bankruptcy provides a net financial benefit. Whether this financial gain perspective applies to lower-income populations is not known. Similarly, further study is needed to properly assess the role of adverse events. In fact, what remains unclear for lower-income populations is the degree to which personal bankruptcy is a decision made for financial gain, a response to unforeseen adverse events, or some combination of these and other factors.

The financial gain and adverse events perspectives have parallels in the mortgage delinquency literature. In a review of this literature, Quercia and Stegman (1992) emphasized that the amount of equity in the home is a key factor in determining a borrower's decision to stop mortgage payments (Foster and Van Order 1984). A lack of home equity limits the ability of borrowers to exercise other options such as sale or refinancing. Borrowers who cannot sell or refinance their home can opt to relinquish their home to the lenders by defaulting on their mortgage. However, most borrowers who lack equity do not default; consequently, negative equity is considered a necessary but not sufficient condition for default. Instead, adverse life events typically induce borrowers to reassess the desirability of continuing to make their mortgage payments. Thus, borrowers are likely to default on their mortgage when they both lack

home equity and experience adverse events such as job loss that lead to financial illiquidity (U.S. Department of Housing Urban 2010). Applied to bankruptcy, the option theory of mortgage default provides support for the financial gain perspective that households are more likely to file for bankruptcy when debts, especially negative home equity, exceed assets. However, the option theory also suggests that households that experience adverse events should be more likely to file.

The research of Fay, Hurst, & White (2002) provides insight into how the financial gain and adverse event explanations affected personal bankruptcy decisions from 1984-1995. While they find support for the financial gain approach to personal bankruptcy, the authors note that “a much larger proportion of households has a financial incentive to file for bankruptcy than actually files each year” (page 712). This important finding indicates that factors other than financial incentive play a major role in determining whether or not to file for bankruptcy. Indeed, the fact that the majority of PSID debtors who would benefit financially from filing nonetheless did not file suggests that financial benefit is at most a necessary but not sufficient condition for filing bankruptcy. A key unresolved question, then, is why more of the debtors who would benefit from filing for bankruptcy do not exercise their bankruptcy option, especially when experiencing adverse life events.

One reason why more people do not file for bankruptcy may relate to social stigma; that is, many of the debtors who would benefit financially by filing for bankruptcy nonetheless do not file because bankruptcy is socially undesirable. Social stigma is difficult to measure, however, so researchers typically analyze stigma using the proxy of bankruptcy filing rates at the court district and state levels. Using such proxies, several studies infer that the stigma of bankruptcy declined over the past three decades and contributed to the rise in filings since 1980.

Another reason why more people do not file for bankruptcy may lie in financial safety nets. Debtors may know someone who can loan them money in an emergency. Other households may have emergency funds available to them through personal savings. We test whether such financial safety nets reduce the likelihood of filing.

Finally, the costs of filing for bankruptcy may discourage many debtors. For indebted households that are struggling to pay bills, bankruptcy filing costs may seem prohibitive, especially among lower income households who are financially constrained. Low and moderate income households who own homes and hold mortgages face additional payment burdens in the form of home repairs, property taxes, and other associated costs of homeownership. The past

decade has brought further risks including subprime mortgage loan products as well as decreases in house prices and home equity. Unfavorable macroeconomic trends have magnified the challenges for LMI homeowners, created additional economic stressors, and increased mortgage delinquencies as well as bankruptcy filings. In this context, we examine whether LMI homeowners are more likely to file for bankruptcy as a result of adverse events.

Methods

Data

We examine the incidence of bankruptcy filings with data collected for the Community Advantage Program (CAP). CAP began as a secondary mortgage market program developed out of a partnership among the Ford Foundation, Fannie Mae, and Self-Help, a leading community development financial institution in North Carolina. The goal of this program is to purchase conventional, fixed-rate prime mortgages originated to LMI families who, given their credit profile, would have otherwise received a sub-prime mortgage or been unable to purchase a home at all.¹¹ Mortgages have to meet one of the following criteria for consideration: 1) borrowers have an annual income of no more than 80% of the area median income (AMI), 2) borrowers are minority with an income not in excess of 115% of AMI, 3) borrowers purchased the home in a high-minority (>30%) or low-income (<80% of AMI) census tract and have an income not in excess of 115% of AMI. By the end of 2004, more than 28,000 mortgages had been purchased.

Data come primarily from the Community Advantage Panel Survey (CAPS), whose participants were drawn from the Community Advantage Program described above. The study sample follows a national database of 3,743 homeowners who participated in a baseline telephone survey and were eligible for annual follow-up surveys. The purpose of the panel survey is to gather detailed longitudinal data about the housing experiences of low-to-moderate income borrowers. The survey effort collects comprehensive demographic and household data in addition to financial and social behaviors¹². Addresses are geo-coded each year and linked to

¹¹ In practice, 11% of CAP borrowers had origination credit scores above 640, debt-to-income ratios less than 38%, and loan-to-value ratios less than 90%; these borrowers may well have been able to secure traditional financing for home purchase. Moreover, an additional 60% of CAP borrowers met two of these criteria at origination.

¹² Survey data was collected by RTI International and the UNC-CH Survey Research Unit.

data available from the U.S. Bureau of the Census and the Administrative Office of the U.S. Courts. We also matched household survey responses to borrower and loan-level data at the time of mortgage origination. Mortgages were originated as home purchase loans between 1999 and 2003 with fixed interest rates and without prepayment penalties or balloon payments.

Sample

The starting point for our sample is 3,708 households that responded to the baseline survey.¹³ Our survey targets the head-of-household, who at baseline averaged 33 years old, had lived in their CAP-mortgaged home an average of 1 year and 4 months, and had a median household income of \$32,500. The average household earned 62% of the median income of the household's MSA. The baseline sample was 54% female and nearly 40% minority. Less than half (46%) were married while another 11% were living with an unmarried partner. At baseline, 22% had never been married while 20% were divorced, widowed, or separated. Roughly half of respondents (53%) had one or more children living in the home. Our final sample consists of 16,785 person-years over the 2003-9 study period.¹⁴

Representativeness

Data from the Community Advantage Panel Survey compare favorably to a random national sample. Riley, Ru, and Quercia (2009) compared baseline CAPS demographics with a sample of low-income homeowners who participated in the 2003 Current Population Survey. Results show that the CAPS respondents are similar to low-income and minority Current Population Survey respondents with respect to household income, minority representation, and household size distributions. CAPS respondents overrepresent the South and are more educated and more attached to the labor force than comparable Current Population Survey respondents.

We also compared CAPS data to the Panel Study of Income Dynamics (PSID). Table 1 displays descriptive statistics from the CAPS and PSID datasets for five different samples. The three 'All' columns show head of household demographic characteristics for homeowners in CAPS 2003, PSID 1996, and PSID 2003. The 2003 PSID lacks data on bankruptcy decisions, but provides temporal comparability to our CAPS 2003 baseline survey. The 1996 PSID contains the data on household bankruptcy filing decisions that Fay, Hurst, and White (2002) and

¹³ We removed 35 survey respondents for whom we do not have mortgage loan origination information; none of these respondents reported filing for bankruptcy.

¹⁴ Interview dates follow but do not exactly correspond to calendar year, particularly at baseline. One-third of baseline interviews were completed in 2001 or 2002. To ease interpretation, we henceforth define these earlier baseline interviews as 2003. Correlations between interview date, calendar year, and survey wave exceed .93.

others have analyzed. Because our study focuses on homeowners and mortgages, we limit the PSID data to 1996 and 2003 homeowners.

Table 1 indicates that the CAPS sample provides a larger representation for females (46%) and minority (39%) head of household homeowners when compared to the PSID sample of homeowners (23% and 11%, respectively). The CAPS sample is 15.8% Latino compared to 4.3% in the 2003 PSID and .2% in the 1996 PSID. This greater share of minorities in the CAPS sample corresponds to ongoing demographic shifts in the U.S. population (The Economist 2011).

Respondents to the baseline 2003 CAPS sample had a much lower median income (\$32,500) when compared to the median income of 2003 PSID homeowners (\$58,000). CAPS respondents were also younger and had a median age of 33 years in 2003 while PSID respondents had a median age of 51 in 2003. The CAPS 2003 sample is more attached to the labor force than the PSID samples because of greater retirement in the PSID. This labor force difference affirms comparisons between CAPS and the Current Population Survey reported earlier.

Table 1 also displays select demographic characteristics for bankruptcy filers. The two 'Filed' columns show race/ethnicity and gender percentages for two samples: the 315 CAPS homeowners who reported filing for bankruptcy in years 2003-09 and the 148 PSID homeowners who reported filing for bankruptcy in years 1984-1995.¹⁵ We report only race/ethnicity and gender because the other demographic features change over time. Comparable percentages of Whites filed for bankruptcy in both the CAPS (62%) and PSID (64%) samples although the PSID sample contains a much higher proportion of Whites (89%). Both samples also show similar percentages of Black filers (CAPS, 28%; PSID, 32%) and that a higher percentage of Blacks filed for bankruptcy when compared to their overall percentages. A more pronounced difference between datasets emerges for Latinos. Nearly 16% of the CAPS sample is Latino, yet Latinos comprise less than 8% of CAPS bankruptcy filers. The 1996 PSID bankruptcy data does not contain a substantial portion of Latino homeowners. The lack of Latino sample for the 1996 PSID bankruptcy data is noteworthy given that our analysis will show that Latinos were much less likely than Whites to file for bankruptcy.

Both CAPS and PSID samples contain head of household gender proportions that are equally distributed across bankruptcy filers and non-filers. The percentages shown in Table 1 do

¹⁵ These years match the period examined by Fay, Hurst, and White and others.

indicate that more females filed in CAPS (47%) than in the PSID (24%). However, this gender difference appears to reflect the higher proportion of female head of household homeowners in CAPS (46%) than in the PSID (23%) rather than the decision to file for bankruptcy.

Specification

We let P_{it} be the conditional probability that household i files for bankruptcy in year t , given that the respondent has not already experienced a bankruptcy during the 2003-9 study period. Although we lag most covariates at time $t-1$ to assure temporal precedence, we expect some covariates to have a contemporaneous impact on the bankruptcy decision at time t . Our full model says that P_{it} relates to covariates as follows:

$$P_{it} = \Phi (X_{i,t-1}\beta + Z_{it}\delta)$$

where Φ is the cumulative normal density, where X is a vector of all independent variables at time $t-1$ and B is a corresponding set of coefficients, and where Z is a set of independent variables at time t and δ is a corresponding set of coefficients. The vector X comprises lagged values for features of the mortgage loan at the time of mortgage origination as well as measures of borrower risk both prior to and during the study period; demographic variables including age, race, and education; and life events in the prior year including adverse events within the household. The vector Z comprises contemporaneous variables including each household's financial benefit of filing and factors outside the household including economic conditions, bankruptcy rates, and policy levers. We describe all measures in the next section.

Measures

Our survey asked respondents whether they filed for personal bankruptcy since their last interview. Respondents who reported filing were then asked when they filed (month and year), how much it cost them to file, and the amount of their debt at the time of filing. Table 3 summarizes this information by year and shows that the database contains a total of 315 bankruptcy filings between years 2003-9.

Tables 4 & 5 display descriptive statistics for continuous and categorical variables, respectively. The tables identify whether each measure varies over time and how we expect values to affect the likelihood that respondents will file for bankruptcy. We grouped the independent variables as follows: 1) risk, 2) demographics, 3) life events, 5) financial gain, and

6) external forces. Risk (1) includes features of the mortgage loan that have been shown to affect mortgage performance. The home is our respondents' largest purchase, and mortgage loan characteristics may also affect household bankruptcy decisions.¹⁶ The timing of home purchase can affect mortgage performance, so we include dummy variables for the year in which the loan was originated.¹⁷ We test the original loan-to-value ratio of the mortgage, which identifies how the respondent's mortgage downpayment compared to the value of the home at the time of purchase. The Community Advantage Program did not require large downpayments, and our baseline sample has a median original mortgage loan to house value ratio of .97 (standard deviation of .083).¹⁸ Because smaller mortgage downpayments could signal that a borrower is more financially constrained, we anticipate that higher original loan to value ratios may predict bankruptcy.¹⁹

We also examine a mortgage origination measure that relates the borrower's monthly debt-to-income cash flow. The front-end ratio denotes the percentage of household income that is devoted toward mortgage payments at mortgage origination. The back-end ratio specifies the portion of the household's monthly income that goes toward paying all debts. We combine the front-end and back-end ratios by subtracting the front-end (debt-to-income) from the back-end (mortgage-to-income). Doing so provides a single, time-invariant measure of each household's monthly non-mortgage debt-to-income ratio at mortgage origination.²⁰ We expect a higher unsecured debt-to-income ratio to predict bankruptcy.

Risk includes three additional measures assessed prior to the bankruptcy risk period. We categorize borrower's credit score at mortgage origination according to standard credit score buckets; we expect a higher rate of bankruptcies among lower credit score buckets. We test whether the respondent received homeownership counseling because counseling prior to home purchase may provide financial education that improves household financial decisions and

¹⁶ Loan servicing can affect mortgage performance, but we find that our eight category dummy variable for servicers does not predict bankruptcy (not shown). For space considerations, we hereafter drop loan servicing.

¹⁷ We combine some origination year categories due to the small portion of loans in the tails and to reduce multicollinearity. We exclude the original interest rate due to its collinearity with origination year.

¹⁸ We multiply original loan to value ratios by 100 to ease interpretation.

¹⁹ Mortgage delinquency is more directly influenced by current home equity, which we capture and include within the financial benefit of filing measure.

²⁰ We do not include a contemporaneous measure of monthly debt-to-income flow because our annual survey data lacks full information on the monthly payment of some bills.

consequently reduces bankruptcies.²¹ We also test prior bankruptcy filing, which comes from a survey question that asked whether or not the respondent ever filed for bankruptcy prior to the origination of their CAP mortgage. If filers exhibit a proclivity toward bankruptcy, then prior bankruptcy filings will be positively associated with later bankruptcies.

While the previous variables were assessed prior to the study period, we also measure risk in our 2003-9 surveys. We capture whether any household members lacks health insurance each year. Although studies indicate that medical bankruptcies often occur among people who have health insurance, health insurance coverage may nonetheless reduce bankruptcies by decreasing expenses incurred due to medical problems. When medical or other emergencies do occur, financial reserves can safeguard households from financial shocks. Conversely, a lack of financial reserves places borrowers at risk when money is needed quickly. As a measure of borrower risk, we assess how the amount of savings and assets that respondents say they could quickly access in an emergency relates to their monthly housing payment.²² We test whether the borrower is a single-female head-of-household because some evidence suggests that these respondents have fewer resources, face greater challenges, and may be more likely to file for bankruptcy (Warren, Sullivan, and Jacoby 2000). We also assess whether the respondent dropped out of high-school or college before or during the study. Drop-outs may experience greater difficulty with employment and career mobility, and be more prone to bankruptcy. Finally, we test self-employment as a proxy of financial risk-taking that may lead to a higher rate of bankruptcy.²³

Demographics (2) identify respondent characteristics such as age, race/ethnicity, education, married/partner status, whether any children live in the home²⁴, and household income. Based on prior work, we expect older and higher educated respondents to have a lower incidence of bankruptcy, while respondents with children in the home should be more likely to experience bankruptcy. We test partnered and married relationships separately, and we expect

²¹ Homeownership counseling was assessed with the following question: “Before buying a home, some people complete homeownership education programs, also referred to as homeownership counseling, or homeownership training. These programs may include homeownership classes, phone counseling and/or completing educational workbooks about homeownership. Did you complete any such homeownership education before buying your home?”

²² Respondents whose savings and assets fall below one month of their housing payment are coded as 0. Respondents whose emergency assets fall between one-to-two months’ worth of housing payments receive a 1 and those whose emergency assets exceed two months’ worth of housing payments are coded as 2.

²³ Self-employed business owners can also discharge business related debts through bankruptcy.

²⁴ We use a binary measure because results do not change when measures account for more than one child.

that widowed, separated, or divorced respondents will be more likely to file for bankruptcy than married respondents. We also anticipate that bankruptcy will be less likely among those respondents who have a family member who would loan them money (equivalent to their monthly housing payment) if they were faced with an emergency and unable to cover the costs with their own savings. We do not expect household income to affect the bankruptcy decision because income is not related to the financial benefit of filing (Fay, Hurst, and White 2002) and because we include a measure of negative income. However, the role of income in the household filing decision has not been firmly established, so we include income in the model to consider potential effects.

We also construct a measure that combines the respondent's house payments and mobility over time. Because house payments and mobility are often intertwined, we create a time-varying categorical dummy variable that incorporates mortgage delinquencies and prepayment behavior via refinancing and selling/moving. A small portion of respondents experienced a mortgage delinquency, and we create a category that identifies whether or not a mortgage delinquency occurred within each year. Borrowers bear responsibility when their mortgages go delinquent, but whether a delinquent loan results in a foreclosure sale can reflect lender practices, state laws, foreclosure prevention programs, and other factors unrelated to the borrower. Consequently, our house payment measure combines foreclosures with mortgage delinquencies. We measure mortgage delinquency using CAP mortgage performance data and survey questions that ask whether the respondent has been late making a housing payment. We do not know the severity for all self-reported house payment delinquencies (whether 30, 60, or 90-days late), so we create a more general binary measure of house payment delinquency that combines data on whether the CAP mortgage experienced a delinquency (for active loans) with self-reported delinquencies on respondents' post-CAP mortgages and/or rent payments (for the 3% of homeowners who became renters). Our house-payment measure also accounts for mortgage prepayment. Over the study period, many respondents prepaid their CAP mortgages, either by selling their homes and moving or by remaining in their homes and refinancing. We assign prepaid loans either to the refinanced category (if the loan is inactive but the borrower did not move) or to a moved category (if the loan is inactive and the borrower moved from the CAP property). We also assess whether or not respondents refinanced subsequent mortgages or moved more than once. In this way, we create a time-varying house-payment measure that

captures delinquencies, refinances, and moves over the entire study period. The impact of moves and refinances on bankruptcy is not clear a priori, but we expect mortgage delinquencies to be associated with bankruptcy because homeowners who experience mortgage delinquencies are more likely to be insolvent. Homeowners who experience mortgage delinquencies also have an incentive to file for bankruptcy, because doing so may prevent or halt foreclosure proceedings. If mortgage delinquencies predict bankruptcies, then, such delinquencies could signify a homeowner overcome with debt, a debtor trying to save her home, or both.

Life events (3) refer to conditions or triggers within the household that may lead respondents to file for bankruptcy. Adverse life events include income reduction shocks, medical problems, unemployment, unexpected major expenses (that exceed \$500), and household dissolution (becoming single through widowhood, separation or divorce). We calculate income reduction shocks as a one-half standard deviation drop in the percentage of change in household income with respect to the prior year's household income.²⁵

Financial gain is measured by financial benefit (4), which estimates the amount of debt that would be relieved under bankruptcy. Fay, Hurst, & White (2002) provided a formula for the financial benefit of filing under Chapter 7 and argued that the formula also applies to Chapter 13 bankruptcies. We incorporate points raised by Lefgren and McIntyre (2009) regarding the substantial costs of filing for bankruptcy and improve on Fay, Hurst, & White's (2002) financial benefit formula by accounting for the costs associated with filing. We derive household i 's net financial benefit of filing for bankruptcy in year t as follows:

$$FinBen_{it} = \max[Debt_{it} - \max [Wealth_{it} + Filing Cost_{it} - Exemptions_{it}, 0], 0]$$

where $Debt_{it}$ is the amount of unsecured debt that would be discharged in bankruptcy in year t ; $Wealth_{it}$ is the household's i 's wealth in year t , or the sum of liquid assets and home equity, that would potentially be forfeited under bankruptcy; $Exemptions_{it}$ is the value of state-level homestead and property exemptions applicable to household i in year t ; and $Filing Cost_{it}$ is the cost of filing for bankruptcy for household i in year t . Because we do not observe filing costs for non-filers, we apply the median cost of filing each year, as reported by our bankruptcy filers and displayed in Table 3, to all respondents.

²⁵ Standard deviations are calculated by year, across households. To calculate income-change at baseline, we use income-at-mortgage origination as the prior year's income.

External forces (5) consist of features outside the household, including contemporaneous measures of economic conditions, local bankruptcy rates, and policy levers. As a measure of neighborhood wealth, we include the median house value of the census tract in ten thousands. To capture local economic conditions, we include the annual unemployment rate at the county level, which we obtain from the Bureau of Labor Statistics.

We expect household bankruptcy filings to be positively influenced by the bankruptcy rate of the respondent's county. Others have tested lagged bankruptcy rates at the court district and state levels as a proxy for social stigma, but if stigma is a local phenomenon affected by friends and family (Fay, Hurst, and White 2002), then contemporaneous bankruptcy rates at the county level should provide a better measure. We calculate county bankruptcy rates by merging the annual total number of non-business bankruptcy filings as reported by the Administrative Office of the U.S. Courts with county population totals from the U.S. Bureau of Census. We assign county bankruptcy rates to households via geocodes.

The most relevant state-level policies are wage, homestead and property exemption laws. We incorporate homestead and personal property exemptions into the financial-benefit measure. We analyze wage garnishment at the state level because our data do not indicate whether a household has experienced wage garnishment; we expect that households in states that exempt wages from garnishment will be less likely to file for bankruptcy. At the federal level, we expect more filings prior to BAPCPA taking effect, and we identify BAPCPA with a categorical indicator of whether the respondent filed during or before the month of October 2005. Finally, we assess both macroeconomic conditions and time using the calendar year as a continuous variable.²⁶ Given deteriorating economic conditions over the course of this study, we expect calendar year to positively influence bankruptcy filings.

Analysis

We first perform multicollinearity diagnostics to identify potential empirical overlap between predictors. After combining or eliminating redundant predictors, variance inflation factors (VIF) fall below 3 for all main effects except BAPCPA, which has a VIF of 6.4 and exhibits slight multicollinearity with year-at-risk (VIF 5.8). With the exception of these two measures, our diagnostics point toward little empirical overlap between predictors.

²⁶ Calendar year exhibits high multicollinearity with year-on-year percentage changes in the Gross Domestic Product (GDP) that we obtained from the Bureau of Economic Analysis.

Consequently, the main effects of individual measures do not appear to be suppressed by other variables in the model.

We consider two approaches to handling missing data: listwise deletion and multiple imputation. We evaluate both approaches in the Appendix. Our analysis indicates that our multiple imputation method is preferable to the listwise deletion method. We describe our rationale and our multiple imputation technique in the Appendix.

We specify a probit linking function. To ease interpretation, we calculate and report odds ratios. We analyze our data using general estimate equations, which does not assume a distribution and provides advantages for longitudinal and correlated response data including consistent estimators (Pan 2001). Because general estimate equations does not estimate by maximum likelihood, model fit indicators such as the likelihood ratio test, AIC, BIC, and Pseudo-R squared are not appropriate. Instead, we evaluate model fit using the quasi-likelihood under the independence model criterion (QIC) developed by Pan (2001). Smaller QIC values indicate a better model fit.

We analyze bankruptcies from 2003-9 as a non-repeatable event; once a household files for bankruptcy, we drop the household in later years. Because our data contain at most one bankruptcy per household, there is no household-level dependence among observations, no household-level bias in standard error estimates or test statistics, and no need nor advantage to cluster the analysis by household (Allison 1995). We do expect dependence among households within states, so we cluster by state using the exchangeable correlation matrix. We perform one-tailed hypothesis tests and evaluate statistical significance at the .05 level.

Findings

Descriptive Statistics

Table 2 displays 2003-9 bankruptcy rates by year across the United States, in counties where respondents lived, and among our sample of CAPS respondents. The unique filing rate shown for CAPS respondents (1.88 percent of households per year) is higher than the overall national filing rate (1.23 percent of households per year) and the overall filing rates in the

counties where they reside (1.29 percent of households per year).²⁷ All filing rates changed over time and spiked in 2005. Close examination of filings by month revealed that nearly all CAPS respondents who filed in 2005 did so during or before October 2005, when BAPCPA took effect. Heightened awareness and concern about the BAPCPA's pending requirements, fees, and impact appears to have led many of our respondents to follow local and national trends and rush to file for bankruptcy before BAPCPA took effect.²⁸

Table 3 displays characteristics of unique CAPS bankruptcies. On average, filers earned 65% of their area-median-income in the prior year, or about \$35,000. Filers also averaged \$35,000 in debt at the time of filing, but the correlation between debt-at-filing and prior year's income is low (.31). On average, CAPS filers benefited \$6,509 from filing and paid \$1,000 to file. Filing costs as reported by CAPS filers increased 50% between 2005 to 2006. This increase closely approximates cost estimates that the Government Accountability Office attributed to BAPCPA (Jones 2008).

Our survey asks respondents why their household filed for bankruptcy, and Figure 1 displays the reasons provided. The leading reasons given for filing are job problems and medical problems, while family breakup is rarely cited. These reasons support the adverse life events hypothesis. A substantial portion of bankruptcy filers also cited problems controlling spending, a finding which supports the cash flow (debt-to-income) hypothesis. Respondents also said that they filed for bankruptcy due to aggressive debt collection by a creditor and because they might lose their home. Figure 1 provides insight into the reasons people give for filing, but non-filers may have experienced similar life events. In the next section, we add a comparison group of non-filers to identify factors that lead households to file for bankruptcy.

Multivariate Findings

The goal of this study is to better understand why LMI homeowners filed for bankruptcy during the past decade. We test whether adverse life events explain personal bankruptcy decisions while controlling for aggregate filing rates and other external forces, as well as household level measures that include demographic characteristics, mortgage features, and the

²⁷ Whereas county and national filing rates include repeated bankruptcies within households, we analyze CAPS bankruptcies as single, unique events within households. CAPS bankruptcy filers are censored in the years after filing. Following Fay, Hurst and White (2002), we compute the personal bankruptcy filing rate as a percentage of households, whereas Jickling and Teefy (2010) report the number of filings per 1,000 population.

²⁸ It is not clear how a higher proportion of our debtors became informed about the ramifications of BAPCPA such that they filed prior to the law taking effect.

financial benefit of filing. Results are displayed with three models in Table 6. Model 3 has the smallest QIC (2,852), which indicates an improvement of fit over both Model 1 (QIC=2,869) and Model 2 (QIC=2,853).²⁹ We display Model 1 to illustrate statistically significant main effects for local house prices, state wage garnishment restrictions, and the federal passage of BAPCPA in October 2005. Model 1 shows that respondents who live in higher priced neighborhoods are less likely to file: for every \$10,000 increase in neighborhood house prices, the likelihood of filing is reduced by 1%. Model 1 also indicates that respondents who live in states where wage garnishment exemptions are higher than what federal law mandates are 22% less likely to file for bankruptcy. Finally, Model 1 indicates that respondents were 69% more likely to file before the passage of BAPCPA. However, all three of these main effects drop from significance with the improved specification of Model 2.

Model 2 introduces each county's annual bankruptcy rate and improves the overall model fit. Introducing the county bankruptcy rate alters the impact of local house prices, wage garnishment exemptions, and BAPCPA such that these variables drop from significance as main effects. We consider a third model that specifies an interaction term between BAPCPA and each county's bankruptcy rate.³⁰

Model 3 provides the best fit to the data. The year of mortgage origination and original mortgage loan to house value are not significant, but the household's monthly cash flow at mortgage origination exerts a strong impact: as the ratio of monthly non-mortgage debt-to-income flow increases by 1, the odds of filing for bankruptcy increases by 7 times. The monthly non-mortgage debt-to-income cash flow is a time-invariant measure that was assessed at mortgage origination. The strong effect of this variable in predicting bankruptcy supports the ability-to-pay perspective and suggests that monthly cash flow patterns remained consistent within households over time.

In terms of borrower risk, three variables affect bankruptcy filings: credit scores at mortgage origination, emergency savings, and health insurance. Respondents in the lower credit score buckets exhibit statistically higher filing rates as expected with one exception. When compared to the reference group of the highest bucket of credit scores at mortgage origination (720+), the higher incidence of filing among the lowest bucket (300-579) is not a statistically

²⁹ These differences in model fit are statistically significant; see parameter estimates introduced in Models 2 & 3.

³⁰ We also tested potential interactions between the county bankruptcy rate and a) local house prices, and b) wage garnishment exemptions. Neither were significant.

significant difference. Table 6 also shows that respondents who held emergency savings equal to one month's housing payment were 20% less likely to file for bankruptcy, whereas those who held savings greater than twice their monthly housing payment were 27% less likely to file. In addition, households that had a family member who was not covered by health insurance were 25% more likely to file for bankruptcy. Model 3 also displays non-significant effects for several measures of risk: previously filed for bankruptcy (before mortgage origination), financial counseling prior to home purchase, female-head-of-household, and self-employment.

Household demographics including education, race/ethnicity, the presence of children, and the resources of family members all affect filing behavior. Table 6 shows that, when compared with college graduates, the odds of filing are higher for high school dropouts, high school graduates, those with associate degrees, and those who attended but did not graduate from college. Formal student loan debt does not drive the higher incidence of filing among college attendees; it usually is not forgiven in bankruptcy absent severe financial hardship and we exclude it from the financial-benefit variable. Race/ethnicity also has an effect: compared to White respondents, Latinos are 35% less likely to file. Families with children living at home are 24% more likely to file for bankruptcy, but the number of children in the household does not increase the likelihood of filing.³¹ Family resources also matter. Respondents who say they do *not* have a family member who can loan them money in an emergency are 23% more likely to file for bankruptcy. The positive direction of effects for those who are separated, divorced, or widowed is consistent with the bankruptcy literature, but not significant when controlling for other household demographics. Age and income do not affect filing proclivity.³²

House payments and mobility also impact filing behavior. Compared to respondents whose mortgage loans were in good standing, respondents who were delinquent on their mortgages were 68% more likely to file. Homeowners who prepaid their loans via refinancing or moving (selling) are not statistically different from active loans in good standing.

Three adverse life events predict bankruptcy. Households that experience unemployment are 30% more likely to file for bankruptcy in the following year. Major unexpected expenses (exceeding \$500) increase the likelihood of filing for bankruptcy by 51%. Finally, households that report difficulty paying medical bills are 22% more likely to file for bankruptcy. Negative

³¹ We tested the number of children in a separate model (not shown).

³² We tested both age and age-squared; neither were significant.

income shock carries a positive sign as predicted but is not significant. Family breakup as measured by married and partnered respondents becoming single is not significant and displays an unexpected negative sign.³³

The financial gain perspective receives empirical support. Model 3 shows that for every thousand dollar increase in the financial benefit of filing for bankruptcy, respondents are 1% more likely to file.³⁴ This effect is nearly identical across all three models; the impact of financial benefit on the household bankruptcy decision does not change with the introduction of either the county bankruptcy rate or BAPCPA.

Factors outside the household are noteworthy. Although Model 1 shows effects for local house prices and wage garnishment restrictions, these variables drop from significance with the introduction of the county bankruptcy rate in Model 2. The county unemployment rate is not statistically significant across models. Similarly, macroeconomic changes in the U.S. economy, identified through the proxy of year, do not increase filings.³⁵ Given the start of a recession in late 2006 and the ensuing financial crisis in 2008, the non-significant findings for time and economic conditions suggest that the impact of macroeconomic factors on personal bankruptcy decisions manifest themselves through household-level unemployment spells, unexpected expenses, and other adverse events that are assessed in the analysis.

Model 3 introduces the interaction of county bankruptcy filing rates with BAPCPA. In our panel, the median county filing rate is 1.1%; hereafter, we use 1% to ease interpretation. Model 3 shows that federal passage of BAPCPA interacted with local (county) bankruptcy rates such that the effect of county bankruptcy rates on filing decisions was more pronounced after BAPCPA took effect in October 2005. Given a county bankruptcy rate of 1%, the difference of respondents' filing proclivity before and after BAPCPA is the sum of the effects before BAPCPA (0.246) plus the interaction term (-.13), which equals .116. Assuming a county bankruptcy rate of 1%, this .116 difference indicates that the odds ratio of filing for bankruptcy before BAPCPA is 1.203. Thus, respondents were 20.3% more likely to file before BAPCPA when the county bankruptcy filing rate was 1%.

³³ 'Became single' identifies changes during the survey panel; it does not exhibit multicollinearity with marital status.

³⁴ This financial-benefit effect coexists with that of emergency-savings; financial benefit and emergency reserves overlap conceptually, but they do not exhibit multicollinearity and both are significant.

³⁵ We tested both year and year-squared; neither were significant.

Figure 2 depicts this interaction visually while controlling for all variables in the model. Filing proclivity is positively related to the county bankruptcy rate before and after BAPCPA. However, among CAPS respondents who lived in counties with higher bankruptcy rates, passage of BAPCPA *increased* filing proclivity. Conversely, passage of BAPCPA *decreased* filing proclivity among those respondents who lived in counties with lower bankruptcy rates.

Changes in the Predicted Probabilities of Filing

Whereas the prior section interpreted average model effects, here we assess how hypothetical changes would affect the bankruptcy filing rate while accounting for each respondent's predicted probability of filing. Following Fay, Hurst, and White (2002), we obtain the percentage change in the filing rate by calculating the average marginal effect for each value, which we derive by estimating the probability of filing for each household while holding all else constant.³⁶ We divide this marginal effect by the average predicted filing rate of our sample, which is 1.12%. All calculations for marginal effects use estimates derived from Model 3. We display the percentage point marginal effects and the percent change in the filing rates for selected variables in Table 7. We limit our interpretation to changes in the filing rate.

Our model predicts that if BAPCPA had been in effect during the entire study, the number of bankruptcy filings would decrease by 23%. Alternatively, our model predicts that if BAPCPA had never been enacted, the filing rate among our LMI respondents would be 45% higher. At the state level, if all states protected their workers' wages from garnishment by creditors beyond the 75% protected by federal law, then our model predicts that the annual bankruptcy filing rate would be 8% lower.

If everyone in our sample had been covered by health insurance, then our model predicts a 7% reduction in the filing rate. Suppose further that no one in our sample had experienced difficulty paying for medical expenses. Our model predicts that the annual bankruptcy filing rate would be 28% lower.

Now consider the financial benefit of filing for bankruptcy. As the financial benefit of bankruptcy increases by \$1,000, our model predicts that the annual bankruptcy filing rate will increase by 2.15%, given the marginal effect of .02 and the predicted annual filing rate of 1.12%.

³⁶ Because we calculate marginal effects based on predicted probabilities rather than estimated coefficients, we circumvent the potential interpretation error noted by Ai and Norton (2003) concerning interaction terms in nonlinear models.

This 2.15% financial benefit effect per \$1,000 increase is much smaller than the corresponding 7.0% increase reported by Fay, Hurst, and White (2002). Thus, if we assume no bias in the measurement of bankruptcy and other variables, the role of financial benefit in motivating debtors to file for bankruptcy was 3.26 times stronger for the general population in 1984-95 than it is for our sample of low and moderate income homeowners in 2003-09. These results indicate that increasing the financial benefit of bankruptcy by \$1,000, perhaps through additional exemptions or by waiving the cost of filing (which averages \$1,000 in our sample), would have a much smaller impact in raising the bankruptcy rate among LMI households when compared to prior estimates for the general population.

Finally, these estimates permit comparison of the relative impact of financial gain and adverse events on the household filing decision. Under the assumptions stated above, a \$1,000 increase in the financial benefit of filing, which is about 15 percent of the median financial benefit over the study period, can be expected to increase the annual bankruptcy filing rate by 2.15%. In contrast, an unexpected expense of \$500 or more is estimated to increase the same probability by 41%. Similarly, experiencing difficulty paying medical expenses is predicted to increase the filing probability by 25%.

Conclusion

We examined personal bankruptcy decisions over the past decade and found that lower-income homeowners filed for personal bankruptcy to cope with household adversities encountered in the prior year, including job loss and periods of unemployment, difficulty paying medical bills, mortgage delinquencies, and unexpected expenses that exceed \$500. The effect of these adverse events on personal bankruptcy decisions stands in contrast to prior research because they persist in context of other plausible explanations such as the financial gain of filing, aggregate bankruptcy filings, and a comparison group of non-filers who could have experienced similar life events. We also find that personal bankruptcy decisions depend largely upon the households' ability to pay bills, as indicated by their non-mortgage monthly cash flow. Moreover, bankruptcies are less likely when household members have financial safety nets including health insurance coverage, emergency savings, and access to family members who would loan them money in an emergency. Lower-income homeowners did file for bankruptcy

when it provided a net financial gain, but the magnitude of this financial benefit effect in our 2003-09 LMI sample is less than one-third of what Fay, Hurst, & White (2002) estimated for the 1984-95 general population. Finally, a federal policy lever reduced filing proclivity: BAPCPA. Local bankruptcy filing rates interacted with the federal passage of BAPCPA such that, after October 2005, the filing proclivity of lower-income homeowners decreased more rapidly in counties with lower filing rates.

The year lag between adverse events and personal bankruptcy decisions may underestimate the presence and magnitude of some adverse events. We linked bankruptcy decisions to survey responses that captured events of the prior year. Consequently, our analysis of a 2007 bankruptcy filing, for example, would assess 2006 household events yet ignore more recent events that may have transpired after completion of the 2006 survey through the 2007 filing. We impose this year-lag to instill confidence in causal direction, but the conservative approach prevents us from observing contemporaneous household adversities that may in fact wield strong influence over filing decisions. Negative income shock, for example, may have a more immediate effect on the filing decision than our lagged analysis could identify.

Our findings nonetheless suggest several policy implications. Federal passage of BAPCPA in 2005, the most comprehensive bankruptcy reform since 1978, combined with local filing patterns to exert a strong, negative impact on the likelihood that lower-income households would file for bankruptcy. This effect runs counter to the official intent of the law. BAPCPA's income-driven means test was purported to affect only higher-income filers, yet our findings demonstrate that BAPCPA decreased filing proclivity among lower-income households. Although nearly all our respondents would pass BAPCPA's income-driven means test, and despite deteriorating economic conditions from 2006 through 2009, passage of the 2005 federal bankruptcy law reduced the likelihood that lower-income homeowners in our sample would file for personal bankruptcy. While lawmakers passed BAPCPA as 'Abuse Prevention', others have suggested that BAPCPA was designed to reduce personal bankruptcy filings altogether (White 2009). Indeed, our findings lend credence to White's (2009) observation that BAPCPA's new requirements for debtors and lawyers were intended to discourage lower-income debtors from filing by raising their filing costs. The BAPCPA effect that we observe occurs during an economic downturn, which suggests that additional federal bankruptcy reform could better address the debts of lower-income households when they experience unemployment, have

unexpected expenses, and are otherwise overcome by insolvency. Furthermore, given that the financial crisis and ensuing recession were rooted in ongoing housing woes, and given that we find mortgage delinquencies to predict bankruptcy filings in the following year, additional bankruptcy reform should give consideration to policies that reduce mortgage default.

Within households, parents raising children face greater financial challenges and even one child dramatically increases the likelihood of filing for bankruptcy. Policies that help families with children cope with child-rearing costs could reduce bankruptcy filings. Policies that address gaps in health insurance coverage should also reduce bankruptcy filings.

Demographically, our findings show that while controlling for a large set of variables, a strong effect remains for race/ethnicity such that Latinos are much less likely to file for bankruptcy. Possible explanations for this Latino effect include language barriers, extended support groups, or cultural norms that favor household solvency. Future research should explore why Latinos are less likely to file.

Future research should also explore the link between aggregate bankruptcy filing rates and household filing decisions. Other researchers have analyzed bankruptcy rates at the district, state, and circuit levels, but these higher levels of analysis may better capture state policy differences or perhaps nuances of the court system rather than social and interpersonal processes which are by definition local. Research on bankruptcy rates should consider two questions: a) how well do aggregate bankruptcy rates proxy for the construct of stigma?, and b) among debtors who would benefit financially by filing for bankruptcy, how strong a role does stigma play in discouraging debtors from filing?

Future research should also differentiate between the types of personal bankruptcies filed. The financial benefit equation pertains to Chapter 7; whether it affects Chapter 13 filings remains unknown.³⁷ Meanwhile, a stated purpose of BAPCPA was to steer more filers away from Chapter 7 and into Chapter 13, but the degree to which the reform achieved this goal needs further study. Finally, when compared to Chapter 7, Chapter 13 bankruptcies provide more formal ways to help filers save their homes from foreclosure. Consequently, Chapter 13 bankruptcies should be more common among filers who want to save their home.

³⁷ The measures that comprise the financial benefit variable (unsecured debt discharged for forfeited non-exempt assets) reflect the attributes of Chapter 7 but not Chapter 13. Most Chapter 13 filers do not finish their repayment plans, and those cases are often simply dismissed without the entry of a discharge.

The home is the largest purchase that most people make, and more research is needed on the relationship between homeownership, mortgage products, mortgage delinquencies, house values, debt, and bankruptcy. Some indebted homeowners may decide to first default on credit card and other bills while prioritizing payment of their mortgage, thereby exhausting household finances on their home before experiencing serious mortgage delinquencies, home foreclosure, and then eventual bankruptcy. More savvy debtors may observe that they owe more on their mortgages than their homes are worth, experience mortgage delinquencies, and then file in order to prevent foreclosure of their home. Additional research could examine the timing of foreclosure proceedings and sales with that of bankruptcy filings to help determine whether seriously delinquent homeowners filed for bankruptcy in order to save their home or instead filed upon finding themselves overcome by insolvency, losing not only their home but also later declaring bankruptcy.

Our analysis covered a decade of financial turbulence and policy change in which we tracked annual events in the lives of lower-income homeowners who had received conventional mortgage products. Our findings show that respondents filed for bankruptcy not simply because it provided a financial benefit, but also to cope with stressors related to cash flow, unemployment, medical bills, unexpected expenses, and mortgage delinquencies. Meanwhile, financial safety nets including health insurance coverage, loan availability from family members, and emergency savings reduced filings. Household bankruptcy decisions were also influenced by local filing rates, which interacted with a federal policy change governing personal bankruptcies. In contrast to the official intent of the law, BAPCPA decreased the filing proclivity of lower-income homeowners who lived in counties with lower filing rates. This finding provides clear evidence that federal policies matter and can negatively affect financially constrained homeowners who face adversity.

Appendix

Our database contains missing data, and listwise deletion of missing data reduced the number of bankruptcy filers available for our analysis from 315 to 116, a reduction of 63%. We estimated models that removed cases with missing data based on listwise deletion, and we display these results in Table A1.

Our listwise deletion methods reduced sample size and thus may have produced inefficient estimates. Compared to listwise deletion, mean substitution, and other approaches to handling missing data, multiple imputation methods produce less biased estimates (Allison 2010). Consequently, we also considered a multiple imputation model which estimated values when independent variables contained missing data. Table 6 displays results of these multiple imputation models.

The model-level statistics (QIC & QICu) are not comparable across the listwise deletion and multiple imputation models due to their different sample sizes. However, comparison of the parameter estimates provides insight. While the direction of most effects is consistent between the listwise deletion models (Table A1) and the multiple imputation models (Table 6), the standard errors are lower for the multiple imputation models. This pattern is consistent with research on missing data: multiple imputation methods typically produce lower standard errors than those produced by methods which use listwise deletion of missing data (Allison 2010). The lower standard errors shown in Table 6 (when compared to Table A1) suggest that the statistical power of the listwise deletion models has been reduced by the smaller number of bankruptcies and overall cases. Given these results, we prefer and interpret the multiple imputation models shown in Table 6.

We derive all imputed values using an imputation model that includes all predictors for the unrestricted specification shown in Model 3 of Table 6, plus four auxiliary covariates: the dependent variable, annual credit scores, interview date, and survey wave response propensities. We include the dependent variable (filed for bankruptcy, yes or no), in our imputation model because doing so produces less biased estimates (Allison 2010). Similarly, we include annual time-varying credit scores as a continuous variable in our imputation model to improve estimates for missing data³⁸. We include the interview date in our imputation model to adjust for the

³⁸ We exclude the time-varying annual credit scores from the analytic model due to concerns over endogeneity. Instead, our analytic model tests credit scores at mortgage origination.

potential effects of time within survey years on item-specific missing data. We also include survey response propensities in our imputation model. The response propensities are associated with the probability that variables contain missing data and should therefore reduce bias (Allison 2010). We derive survey response propensities from models that use baseline demographic variables to predict annual retention among the eligible respondents (Riley et al. 2010). The response propensities adjust for unit non-response among households that did not complete one or more intermediate surveys yet did complete a survey in a later year. These later surveys tell us whether a bankruptcy occurred during a year in which a household did not complete an intermediate survey. We address unit and item non-response using multiple imputation. In order to minimize bias and standard errors during imputation, we structure the data so that there is one row per household across years and thus allow the imputation to use all available information within households over time (Allison 2010). We round categorical variables to ease interpretation. We perform 100 multiple imputation iterations. Following imputation, we transpose the data into panel form for the analytic model that predicts bankruptcy.

Our multiple imputation technique assumes that data is missing at random, but two items were not asked in the baseline survey and therefore contain missing data that is not missing at random. For these measures, we apply a second approach to missing data by creating an ‘unknown’ category for data that is missing due to survey design, and we examine whether this category affects bankruptcy filings. The missing data category is significant for one measure (previously filed for bankruptcy), so for this measure we model the ‘unknown’ category to control for non-random missing data effects. The missing data category is not significant for the other measure (medical expenses) and it does not alter effects for other categories, so for this measure we address missing data using the aforementioned multiple imputation techniques.

References

- Ai, C. R., and E. C. Norton. 2003. Interaction terms in logit and probit models. *Economics Letters* 80 (1):123-129.
- Allison, Paul D. 1995. *Survival analysis using SAS: A practical guide*. Cary, NC: SAS Institute Inc.
- Allison, Paul D. 2010. Missing Data. In *Handbook of Survey Research*, edited by J. D. Wright and P. V. Marsden. Bingley, UK: Emerald Group Publishing Ltd.
- Dawsey, Amanda E. 2001. Informal Bankruptcy, University of Maryland, College Park, MD.
- Domowitz, Ian, and Robert Sartain. 1999. Determinants of the Consumer Bankruptcy Decision. *The Journal of Finance* 54 (1):403-420.
- Edmiston, Kelly. 2006. A New Perspective on Rising Nonbusiness Bankruptcy Filing Rates: Analyzing the Regional Factors. *Economic Review* 91 (2):55-80.
- Fay, Scott, Erik Hurst, and Michelle J. White. 2002. The Household Bankruptcy Decision. *American Economic Review* 92 (3):706-718.
- Filer II, Larry H., and Jonathan D. Fisher. 2005. The Consumption Effects Associated with Filing for Personal Bankruptcy. *Southern Economic Journal* 71 (4):837-854.
- Fisher, Jonathan D. 2005. The Effect of Unemployment Benefits, Welfare Benefits, and Other Income on Personal Bankruptcy. *Contemporary Economic Policy* 23 (4):483-492.
- Fisher, Jonathan D. 2006. Till Debt Do Us Part: A Model of Divorce and Personal Bankruptcy. *Review of Economics of the Household* 4 (1):35-52.
- Foster, Chester, and Robert Van Order. 1984. An option-based model of mortgage default. *Housing Finance Review* 3:351-372.
- Gross, David B., and Nicholas S. Souleles. 2002. An Empirical Analysis of Personal Bankruptcy and Delinquency. *The Review of Financial Studies* 15 (1):319-347.
- Himmelstein, David U., Deborah Thorne, Elizabeth Warren, and Steffie Woolhandler. 2009. Medical Bankruptcy in the United States, 2007: Results of a National Study. *American Journal of Medicine* 122 (8):741-746.
- Jacoby, Melissa B., and Mirya R. Holman. 2010. Managing Medical Bills on the Brink of Bankruptcy. *Yale Journal of Health Policy, Law, and Ethics* 10 (2):239-297.
- Jickling, Mark, and Jennifer Teefy. 2010. Consumer Bankruptcy and Household Debt. In *CRS report for Congress*, edited by H. D. Negley. Washington, D.C.: Congressional Research Service, Library of Congress.

- Jones, Yvonne D. 2008. Bankruptcy Report: Dollar Costs Associated with the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005. In *GAO Reports*: U.S. Government Accountability Office.
- Kowalewski, K. 2000. Personal Bankruptcy: A Literature Review. Washington, D.C.: Congressional Budget Office.
- Lawless, Robert M., Angela K. Littwin, Katherine M. Porter, John A. E. Pottow, Deborah K. Thorne, and Elizabeth Warren. 2008. Did Bankruptcy Reform Fail? An Empirical Study of Consumer Debtors. *American Bankruptcy Law Journal* 82 (3):349-405.
- Lefgren, Lars, and Frank McIntyre. 2009. Explaining the Puzzle of Cross-State Differences in Bankruptcy Rates. *The Journal of Law and Economics* 52 (2):367-393.
- Li, Wenli. 2009. Residential Housing and Personal Bankruptcy. *Business Review* (Q2):19-29.
- Pan, Wei. 2001. Akaike's Information Criterion in Generalized Estimating Equations. *Biometrics* 57 (1):120-125.
- Quercia, Roberto G., and Michael A. Stegman. 1992. Residential Mortgage Default: A Review of the Literature. *Journal of Housing Research* 3 (2):341-379.
- Riley, Sarah F., Hongyu Ru, Mark R. Lindblad, and Roberto G. Quercia. 2010. The Community Advantage Program Survey: Data Collection Update and Analysis of Panel Attrition. University of North Carolina at Chapel Hill Center for Community Capital.
- Riley, Sarah F., Hongyu Ru, and Roberto G. Quercia. 2009. The Community Advantage Program Database: Overview and Comparison With the Current Population Survey. *Cityscape* 11 (3):247-256.
- Sullivan, Teresa A., Elizabeth Warren, and Jay Westbrook. 2000. *The Fragile Middle Class: Americans in Debt*. Edited by J. L. Westbrook. New Haven Conn.: Yale University Press.
- The Economist. 2011. Minority report: White America's collapsing birth rate is changing the face of the country. *The Economist*, <http://www.economist.com/node/18488452>.
- U. S. Department of Housing Urban, Development. 2010. Report to Congress on the Root Causes of the Foreclosure Crisis.
- Warren, Elizabeth, Teresa A. Sullivan, and Melissa B. Jacoby. 2000. Medical Problems and Bankruptcy Filings. In *Norton's Bankruptcy Adviser*: SSRN.
- White, M. J. 2009. Bankruptcy: Past Puzzles, Recent Reforms, and the Mortgage Crisis. *American law and economics review* 11 (1):1-23.

Table 1
Household Bankruptcy Decisions of Homeowners:
Community Advantage Panel Survey Compared to Panel Study of Income Dynamics

Homeowners' Demographics (Head of the Household)		CAPS 2003-09		PSID 1984-95		PSID 2003
		All 2003	Filed 2003-09	All 1996	Filed 1984-95	All 2003
Race/Ethnicity	White	61.0	62.2	88.6	64.2	83.1
	Black	19.3	27.6	8.4	32.4	7.4
	Latino	15.8	7.6	0.2	0.7	4.3
	Other	3.3	2.5	2.8	2.7	5.2
Gender	Male	53.7	53.3	77.3	75.7	78.4
	Female	46.3	46.7	22.7	24.3	21.6
Number of Children	None	47.4		64.1		65.1
	1 or more	52.6		45.9		34.9
Marital Status	Married	45.6		67.1		64.9
	Never Married	23.2		7.1		8.5
	Divorced	16.0		11.2		14.8
	Separated	2.0		5.5		1.7
	Other	13.1		9.1		10.1
Working Status	Working	92.3		66.7		71.5
	Looking for Work	3.2		1.3		1.9
	Retired	1.7		25.5		14.8
	Other	2.8		6.5		11.8
Education	Less Than High School	9.9		19.7		14.2
	High School Graduate	24.1		31.2		30.0
	Some College	31.2		20.2		21.1
	College Graduate	14.8		15.3		17.2
	Post-Graduate	9.4		11.6		12.5
	Missing	0.1		2.1		5.0
Age (Median)		32.8		50.0		51.0
Household Income (Median)		\$32,500		\$44,570		\$58,000
Sample Size		3,708	315	922,31	148	73,224,915

Sources: Community Advantage Panel Survey (CAPS) 2003-9 and Panel Study of Income Dynamics (PSID) 1992-96, 2003.

- Note:*
1. Data is limited to 2003 or 1996 homeowners. We exclude renters and those living rent-free.
 2. Cell Values are percentages, years (age), dollars (income), or counts (sample size).
 3. Data for bankruptcy filers covers all years of each panel for time invariant characteristics only (race/ethnicity and gender).
 4. PSID bankruptcy filings cover years 1984-95 for those homeowners who responded to the PSID in years 1992-1996.

Table 2
Bankruptcy Filing Rates by Year

Year	Bankruptcy Filing Rates (percent of households)		
	All U.S.	CAPS Counties	CAPS
2003	1.54	1.62	3.13
2004	1.48	1.62	1.84
2005	1.93	2.15	3.11
2006	.56	.66	1.03
2007	.77	.82	1.24
2008	1.01	1.01	1.50
2009	1.33	1.31	1.97
Mean:	1.23	1.29	1.88

Sources: The Administrative Office of the U.S. Courts, the U.S. Bureau of the Census, and the Community Advantage Panel Survey (CAPS).

Note: Only CAPS bankruptcies are unique within households. Filing rates for 'All U.S.' and 'CAPS Counties' are calculated using 2000 Census data that does not vary by year.

Table 3
Bankruptcies in the Community Advantage Panel Survey by Year

Year	Number of Filings	Cost of Filing	Debt at Filing	Financial Benefit of Filing	Income prior year	Relative Income prior year
2003	42	\$700	\$30,000	\$7,123	\$27,500	.53
2004	54	\$800	\$30,000	\$7,571	\$28,750	.59
2005	80	\$1,000	\$30,000	\$6,505	\$33,750	.64
2006	30	\$1,500	\$35,000	\$5,530	\$39,375	.72
2007	32	\$1,400	\$45,000	\$6,726	\$40,000	.62
2008	35	\$1,400	\$49,000	\$6,275	\$43,000	.84
2009	42	\$1,200	\$60,000	\$6,313	\$42,500	.76
Sum or Median	315	\$1,000	\$35,000	\$6,509	\$35,000	.65

Sources: The Community Advantage Panel Survey (CAPS) and the U.S. Bureau of the Census.

Note: CAPS bankruptcies are unique within households. Table displays frequencies and medians. Relative income equals household income divided by the median income of the respondent's Metropolitan Statistical Area or, for rural respondents, the state average.

Table 4

Continuous Variables: Descriptive Statistics after Multiple Imputation

<i>Variable Group</i>	<i>Variable</i>	<i>Hyp- othesis</i>	<i>Time- Varying?</i>	<i>Mean</i>	<i>Median</i>	<i>Standard Deviation</i>	<i>Min</i>	<i>Max</i>	<i>Kurt</i>	<i>Skew</i>
Time	Year at risk (2003-2009)	+	Yes	2006.07	2006.00	1.85	2003.00	2009.00	-1.12	0.04
Mortgage Loan	Original loan to house value	+	No	96.14	97.00	8.32	12.73	124.32	27.53	-4.47
	Monthly cash flow (DTI ratio)	+	No	0.10	0.09	0.08	-0.31	0.90	4.01	1.01
Demographics	Age in decades	-	Yes	3.80	3.54	1.10	-0.30	9.25	0.97	1.03
	Income in thousands	n.s.	Yes	44.48	40.00	24.93	-78.05	280.00	5.66	1.62
Financial Gain	Financial benefit of filing	+	Yes	7.05	6.25	8.79	-25.90	152.50	49.65	5.24
External Forces	Local unemployment rate	+	Yes	5.77	5.34	2.07	1.89	20.95	4.77	1.80
	House prices in ten thousands	-	Yes	13.11	11.08	7.73	-8.87	119.25	17.80	3.14
	Bankruptcy rate of county	+	Yes	1.29	1.10	0.79	-0.67	6.00	2.80	1.41
	BAPCPA X Bankruptcy Rate	+	Yes	0.74	0.00	1.03	-1.08	5.82	0.93	1.23

Notes: n.s.= not significant, which indicates that no statistically significant relationship is hypothesized.

N=1,678,500. The analysis concatenates 100 imputed datasets that each has 16,785 rows.

Table 5

Categorical Variables: Descriptive Statistics after Multiple Imputation

<i>Variable Group</i>	<i>Variable</i>	<i>Value</i>	<i>Hyp- othesis</i>	<i>Time- Varying?</i>	<i>Frequency</i>	<i>Percent</i>
Outcome	Filed for Bankruptcy	No = 0	n/a	Yes	1647000	98.12
		Yes = 1	n/a	Yes	31500	1.88
Mortgage Loan	Year mortgage originated	1999-2000	–	No	439400	26.18
		2001	–	No	495000	29.49
		2002-2003	Reference	No	744100	44.33
	Credit score bucket at mortgage origination	300 – 579	+	No	68800	4.10
		580 – 619	+	No	180300	10.74
		620 – 659	+	No	383871	22.87
		660 – 719	+	No	577930	34.43
		720+	Reference	No	467599	27.86
Borrower Risk	Filed for bankruptcy before mortgage origination	Never filed	Reference	No	1241300	73.95
		Previous filer	+	No	96200	5.73
		Unknown	None	No	341000	20.32
	Homeownership counseling prior to home purchase	No	Reference	No	955040	56.90
		Yes	–	No	723460	43.10
	Female head of household	No	Reference	No	1288977	76.79
		Yes	+	No	389523	23.21
	Type of employment	Other	Reference	Yes	1578235	94.03
		Self employed	+	Yes	100265	5.97
	Emergency savings	Less than one month	Reference	Yes	381261	22.71
		One month	–	Yes	317134	18.89
		Two months	–	Yes	980105	58.39
	Health insurance	Covered	Reference	Yes	1351800	80.54
		Not covered	+	Yes	326700	19.46
Demographics	Race /ethnicity	White	Reference	No	1052000	62.68
		Black	n.s.	No	319100	19.01
		Latino	n.s.	No	251600	14.99
		Other	n.s.	No	55800	3.32
	Education	College graduate	Reference	Yes	427138	25.45
		High school dropout	+	Yes	158000	9.41
		High school graduate	+	Yes	395800	23.58
		Associate degree	+	Yes	231000	13.76
		Some college, no degree	+	Yes	466562	27.80

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Table 5

Categorical Variables: Descriptive Statistics after Multiple Imputation

<i>Variable Group</i>	<i>Variable</i>	<i>Value</i>	<i>Hyp- othesis</i>	<i>Time- Varying?</i>	<i>Frequency</i>	<i>Percent</i>	
Demographics	Partner status	Married	Reference	Yes	884606	52.70	
		Never married	None	Yes	331330	19.74	
		Unmarried partner	None	Yes	139165	8.29	
		Widowed or separated	+	Yes	323399	19.27	
	Children in household	None	Reference	Yes	709000	42.24	
		One or more	+	Yes	969500	57.76	
	Emergency loan	Available	Reference	Yes	1466462	87.37	
		Unavailable	+	Yes	212038	12.63	
	House payment	Active	Reference	Yes	712500	42.45	
		Delinquent	+	Yes	219900	13.10	
		Moved	None	Yes	107700	6.42	
		Refinanced	None	Yes	638400	38.03	
Adverse Events	Family Breakup	No	Reference	Yes	1645479	98.03	
		Yes (became single)	+	Yes	33021	1.97	
	Employment	No unemployment spell	Reference	Yes	1408000	83.88	
		Unemployment Spell	+	Yes	270500	16.12	
	Unexpected expense	No	Reference	Yes	934799	55.69	
		Yes	+	Yes	743701	44.31	
	Medical expenses	Can pay medical bills	Reference	Yes	1164598	69.38	
		Difficulty paying bills	+	Yes	513902	30.62	
	Negative income shock	No	Reference	Yes	1493731	88.99	
		Yes	+	Yes	184769	11.01	
	External Forces	Wage garnishment	Garnishment Allowed	Reference	No	889100	52.97
			State Protects Wages	-	No	789400	47.03
BAPCPA		Before November 2005	+	No	683500	40.72	
		November 2005 or later	Reference	No	995000	59.28	

Notes: n.s.= not significant, which indicates that no statistically significant relationship is hypothesized.
N=1,678,500. The analysis concatenates 100 imputed datasets that each has 16,785 rows.

Table 6
Bankruptcy Regressed on Mortgages, Borrower Risk, Demographics, Adverse Events, Financial Gain, and External Forces

Variable Group	Predictor	Category	<u>Model 1</u>		<u>Model 2</u>		<u>Model 3</u>	
			Coefficient(StdErr)	Odds Ratio	Coefficient(StdErr)	Odds Ratio	Coefficient(StdErr)	Odds Ratio
Time	Year at risk (2003-2009)		0.017 (0.03)	1.03	-0.016 (0.031)	0.97	-0.019 (0.031)	0.97
Mortgage Loan	Year mortgage originated	1999-2000	0.051 (0.068)	1.09	0.043 (0.068)	1.07	0.038 (0.068)	1.06
		2001	0.063 (0.063)	1.11	0.051 (0.063)	1.08	0.048 (0.064)	1.08
	Original loan to house value		0.004 (0.004)	1.01	0.004 (0.004)	1.01	0.004 (0.004)	1.01
	Monthly cash flow	(debt-to-income ratio)	1.082 (0.284)*	6.16	1.136 (0.286)*	6.82	1.151 (0.286)*	7.01
	Credit score bucket at mortgage origination	300 – 579	0.182 (0.127)	1.34	0.179 (0.127)	1.33	0.183 (0.127)	1.34
		580 – 619	0.324 (0.092)*	1.68	0.308 (0.092)*	1.64	0.311 (0.093)*	1.65
		620 – 659	0.179 (0.083)*	1.33	0.175 (0.084)*	1.32	0.179 (0.084)*	1.33
	660 – 719	0.169 (0.08)*	1.31	0.177 (0.08)*	1.33	0.181 (0.08)*	1.33	
Borrower Risk	Filed for bankruptcy before mortgage origination	Previous filer	0.12 (0.089)	1.21	0.096 (0.09)	1.17	0.098 (0.09)	1.17
		Unknown	-0.29 (0.072)*	0.63	-0.301 (0.073)*	0.62	-0.301 (0.073)*	0.62
	Homeownership counseling	Yes	-0.034 (0.053)	0.95	-0.035 (0.053)	0.95	-0.033 (0.054)	0.95
	Female head of household	Yes	0.01 (0.084)	1.02	0.013 (0.085)	1.02	0.015 (0.085)	1.02
	Type of employment	Self employed	-0.112 (0.116)	0.84	-0.102 (0.117)	0.85	-0.109 (0.117)	0.84
	Emergency savings	One month	-0.125 (0.071)*	0.82	-0.138 (0.071)*	0.80	-0.139 (0.071)*	0.80
		Two months	-0.19 (0.06)*	0.74	-0.195 (0.06)*	0.73	-0.196 (0.06)*	0.73
Health insurance	Not covered	0.143 (0.063)*	1.26	0.141 (0.063)*	1.25	0.139 (0.064)*	1.25	
Demographics	Age in decades		0.03 (0.029)	1.05	0.032 (0.029)	1.05	0.032 (0.029)	1.05
	Race /ethnicity	Black	0.073 (0.066)	1.12	0.044 (0.067)	1.07	0.041 (0.067)	1.07
		Latino	-0.288 (0.095)*	0.63	-0.27 (0.096)*	0.65	-0.272 (0.096)*	0.65
		Other	-0.131 (0.152)	0.81	-0.133 (0.153)	0.81	-0.138 (0.154)	0.80
	Education	High school dropout	0.184 (0.117)	1.34	0.192 (0.118)	1.36	0.196 (0.118)*	1.37
		High school graduate	0.331 (0.084)*	1.70	0.331 (0.084)*	1.70	0.333 (0.084)*	1.71
		Associate degree	0.29 (0.091)*	1.59	0.299 (0.091)*	1.62	0.303 (0.091)*	1.62
Some college, no degree		0.196 (0.081)*	1.37	0.196 (0.082)*	1.37	0.197 (0.082)*	1.37	

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Table 6
Bankruptcy Regressed on Mortgages, Borrower Risk, Demographics, Adverse Events, Financial Gain, and External Forces

Variable Group	Predictor	Category	<u>Model 1</u>		<u>Model 2</u>		<u>Model 3</u>	
			Coefficient(StdErr)	Odds Ratio	Coefficient(StdErr)	Odds Ratio	Coefficient(StdErr)	Odds Ratio
Demographics	Partner status	Never married	-0.016 (0.092)	0.97	-0.013 (0.093)	0.98	-0.009 (0.093)	0.99
		Unmarried partner	-0.119 (0.098)	0.83	-0.113 (0.099)	0.83	-0.11 (0.099)	0.84
		Widowed/Divorced/Sep	0.042 (0.089)	1.07	0.047 (0.09)	1.08	0.046 (0.09)	1.08
	Children in household	One or more	0.123 (0.058)*	1.22	0.132 (0.058)*	1.24	0.133 (0.058)*	1.24
	Income in thousands		0.001 (0.001)	1.00	0.001 (0.001)	1.00	0.001 (0.001)	1.00
	Emergency loan	Unavailable	0.137 (0.069)*	1.24	0.133 (0.069)*	1.24	0.128 (0.069)*	1.23
	House payment	Delinquent	0.314 (0.068)*	1.65	0.32 (0.068)*	1.67	0.323 (0.068)*	1.68
		Moved	0.089 (0.126)	1.15	0.087 (0.126)	1.15	0.091 (0.127)	1.16
Refinanced		-0.028 (0.07)	0.96	-0.019 (0.07)	0.97	-0.013 (0.07)	0.98	
Adverse Events	Family breakup	Yes (became single)	-0.036 (0.177)	0.94	-0.036 (0.178)	0.94	-0.026 (0.178)	0.96
	Employment	Unemployment Spell	0.163 (0.061)*	1.30	0.161 (0.061)*	1.29	0.163 (0.061)*	1.30
	Unexpected expense	Yes	0.255 (0.055)*	1.50	0.255 (0.055)*	1.50	0.258 (0.055)*	1.51
	Medical expenses	Difficulty Paying	0.123 (0.059)*	1.22	0.124 (0.059)*	1.22	0.125 (0.059)*	1.22
	Negative income shock	Yes	0.048 (0.076)	1.08	0.048 (0.077)	1.08	0.047 (0.077)	1.08
Financial Gain	Financial benefit of filing		0.008 (0.002)*	1.01	0.008 (0.002)*	1.01	0.008 (0.002)*	1.01
External Forces	Local unemployment rate		0.02 (0.013)	1.03	0.015 (0.014)	1.02	0.01 (0.014)	1.02
	Local house prices		-0.009 (0.005)*	0.99	-0.007 (0.005)	0.99	-0.008 (0.005)	0.99
	Wage Garnishment policy	State Protects Wages	-0.158 (0.053)*	0.78	-0.063 (0.059)	0.90	-0.064 (0.059)	0.90
	BAPCPA	Before November 2005	0.326 (0.105)*	1.69	0.075 (0.122)	1.13	0.246 (0.155)	1.48
	Bankruptcy rate of county				0.156 (0.039)*	1.28	0.242 (0.059)*	1.47
	BAPCPA X Bankruptcy rate						-0.13 (0.07)*	0.81
Model Statistics	Intercept		-38.072 (60.008)		29.095 (62.343)		33.526 (62.542)	
	QIC		2,869		2,853		2,852	
	QICu		2,883		2,869		2,867	

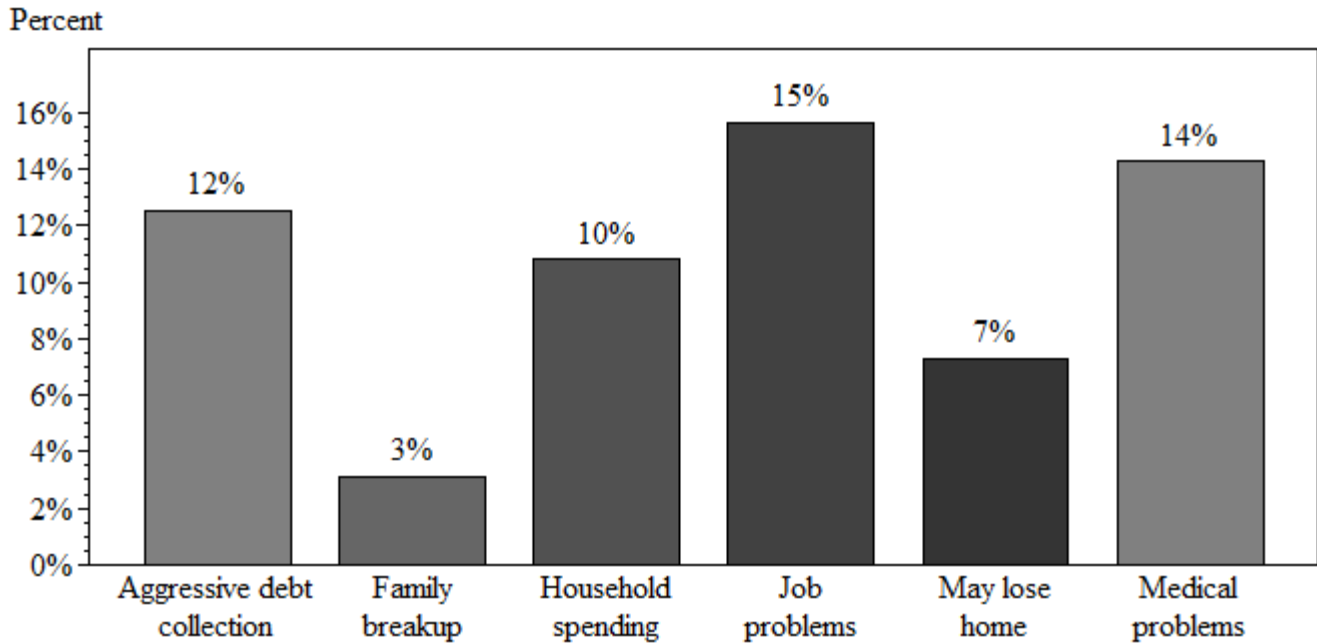
Notes: * p < .05. Analysis performs one-tailed hypothesis tests using the Probit link in a General Estimate Equations model that clusters by state. The sample of 1,678,500 concatenates 100 imputed data sets. Each data set contains 16,785 household-rows that were constructed from 3,708 baseline respondents.

Table 7
 Predicted Bankruptcy Filing Rates based on Marginal Effects

Variable Group	Predictor	Hypothesized change in value of variable	Marginal Effect	Change in Filing Rate (%)	
Borrower Risk	Health Insurance	Everyone is covered by health insurance	-0.08	-6.89	
		Emergency Savings	Everyone has less than 1 month's house payment	0.49	43.60
	Monthly Cash Flow (debt-to-income ratio)	Everyone has between 1-2 month's house payment	0.01	0.70	
		Everyone > 2 month's house payment	-0.15	-13.62	
		Plus 1 standard deviation (+ .08)	0.39	34.47	
		Minus 1 standard deviation (- .08)	-0.30	-26.52	
Adverse Events	Employment	No Unemployment Spells	-0.07	-6.67	
		Unexpected expense > \$500	No one experiences	-0.32	-28.18
	Negative income shock	Everyone experiences	0.46	41.31	
		No one experiences	-0.02	-1.36	
	Medical expenses	Everyone experiences	0.13	11.62	
		None have difficulty paying	-0.32	-28.18	
	Financial Gain	Financial benefit of Filing	Everyone has difficulty paying	0.29	25.53
			+ \$1,000	0.02	2.15
External Forces	Local unemployment rate	- \$1,000	-0.02	-2.11	
		Minus 1 standard deviation (- 2.07)	-0.06	-5.07	
	Bankruptcy rate	Plus 1 standard deviation (+2.07)	0.12	10.85	
		Minus 1 standard deviation (- .79)	-0.46	-40.53	
	State wage exemption policy	Plus 1 standard deviation (+ .79)	0.70	62.67	
		Wages Protected in All States	-0.09	-8.04	
	BAPCPA	Wage Garnishment Allowed in All States	0.10	8.78	
		Always enacted during study period	-0.26	-23.50	
		Never enacted during study period	0.51	45.33	

Notes: Following Fay, Hurst, and White (2002), we obtain the percentage change in the filing rate by calculating the average marginal effect for each value, which we derive by estimating the probability of filing for each household while holding all else constant, divided by the average annual filing rate, which is 1.12%.

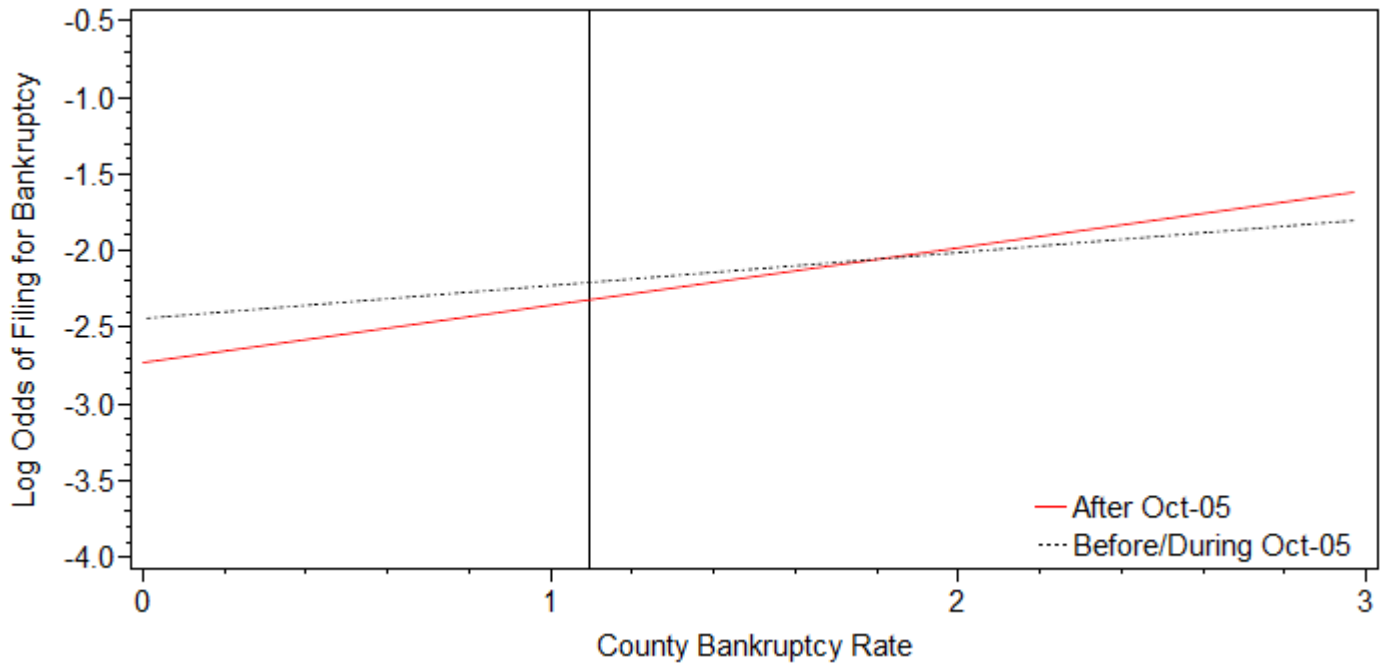
Figure 1
Reasons given for Filing for Bankruptcy



Source: The Community Advantage Panel Survey, 2007-2010. Sample consists of 109 Bankruptcy Filers.

Note: Bankruptcy filers could provide more than one reason for filing. Starting in 2007, respondents who reported filing were presented with a list of possible reasons and more than one option could be selected. An 'other' option gathered open-ended responses about the reasons for filing for bankruptcy. We content analyzed these responses and combined them into the frequencies shown in Figure-1.

Figure 2
CAPS Bankruptcy Filings Regressed on County Filing Rates Before and After BAPCPA



Sources: The Community Advantage Panel Survey, the Administrative Office of the U.S. Courts, and the U.S. Bureau of the Census.

Note: The vertical line in the graph identifies the median county bankruptcy rate in CAPS counties, which is 1.1.

Table A1
Supplemental Comparison Models Using Smaller Sample Derived from Listwise Deletion of Missing Data

<i>Variable Group</i>	<i>Predictor</i>	<i>Category</i>	<i>Model A1</i>		<i>Model A2</i>		<i>Model A3</i>	
			<i>Coefficient(StdErr)</i>	<i>Odds Ratio</i>	<i>Coefficient(StdErr)</i>	<i>Odds Ratio</i>	<i>Coefficient(StdErr)</i>	<i>Odds Ratio</i>
Time	Year at risk (2003-2009)		0.038 (0.044)	1.06	0.003 (0.05)	1.00	0.003 (0.045)	1.01
Mortgage Loan	Year mortgage originated	1999-2000	0.095 (0.086)	1.16	0.099 (0.077)	1.17	0.076 (0.074)	1.13
		2001	-0.092 (0.095)	0.86	-0.11 (0.089)	0.84	-0.119 (0.089)	0.83
	Original loan to house value		0.003 (0.005)	1.00	0.002 (0.005)	1.00	0.002 (0.005)	1.00
	Monthly cash flow	(debt-to-income ratio)	1.458 (0.406)*	12.81	1.483 (0.372)*	13.47	1.56 (0.373)*	15.83
	Credit score bucket at mortgage origination	300 – 579	-0.071 (0.184)	0.89	-0.055 (0.186)	0.92	-0.058 (0.187)	0.91
		580 – 619	0.18 (0.091)*	1.33	0.163 (0.099)*	1.30	0.153 (0.101)	1.28
		620 – 659	-0.092 (0.129)	0.86	-0.09 (0.127)	0.87	-0.092 (0.128)	0.86
	660 – 719	0.077 (0.086)	1.13	0.092 (0.083)	1.16	0.097 (0.082)	1.17	
Borrower Risk	Filed for bankruptcy before mortgage origination	Previous filer	0.195 (0.105)*	1.36	0.17 (0.107)	1.31	0.193 (0.103)*	1.36
		Unknown	-0.083 (0.159)	0.88	-0.082 (0.154)	0.88	-0.085 (0.158)	0.87
	Homeownership counseling	Yes	-0.096 (0.092)	0.86	-0.094 (0.092)	0.86	-0.095 (0.093)	0.86
	Female head of household	Yes	-0.072 (0.107)	0.89	-0.069 (0.105)	0.90	-0.064 (0.107)	0.90
	Type of employment	Self employed	-0.244 (0.145)	0.68	-0.247 (0.154)	0.67	-0.266 (0.161)	0.65
	Emergency savings	One month	-0.074 (0.073)	0.89	-0.098 (0.073)	0.86	-0.095 (0.074)	0.86
		Two months	-0.296 (0.12)*	0.62	-0.306 (0.123)*	0.61	-0.301 (0.123)*	0.62
	Health insurance	Not covered	0.096 (0.125)	1.17	0.096 (0.127)	1.17	0.105 (0.128)	1.18
Demographics	Age in decades		0.066 (0.04)	1.11	0.065 (0.04)	1.11	0.065 (0.039)*	1.11
	Race /ethnicity	Black	0.201 (0.132)	1.38	0.189 (0.134)	1.35	0.179 (0.134)	1.33
		Latino	-0.044 (0.175)	0.93	-0.047 (0.17)	0.93	-0.061 (0.168)	0.91
		Other	0.116 (0.266)	1.20	0.09 (0.256)	1.15	0.073 (0.25)	1.12
	Education	High school dropout	0.26 (0.122)*	1.52	0.288 (0.117)*	1.59	0.293 (0.117)*	1.60
		High school graduate	0.493 (0.121)*	2.21	0.494 (0.117)*	2.22	0.501 (0.115)*	2.25
		Associate degree	0.405 (0.142)*	1.92	0.416 (0.144)*	1.95	0.419 (0.145)*	1.96
Some college, no degree		0.131 (0.061)*	1.23	0.129 (0.06)*	1.23	0.137 (0.059)*	1.24	

Continued on next page

Table A1
Supplemental Comparison Models Using Smaller Sample Derived from Listwise Deletion of Missing Data

<i>Variable Group</i>	<i>Predictor</i>	<i>Category</i>	<i>Model A1</i>		<i>Model A2</i>		<i>Model A3</i>	
			<i>Coefficient(StdErr)</i>	<i>Odds Ratio</i>	<i>Coefficient(StdErr)</i>	<i>Odds Ratio</i>	<i>Coefficient(StdErr)</i>	<i>Odds Ratio</i>
Demographics	Partner status	Never married	0.025 (0.126)	1.04	0.04 (0.121)	1.07	0.057 (0.119)	1.10
		Unmarried partner	-0.242 (0.257)	0.68	-0.224 (0.254)	0.70	-0.207 (0.257)	0.72
		Widowed/Divorced/Sep	0.026 (0.212)	1.04	0.032 (0.211)	1.05	0.032 (0.209)	1.05
	Children in household	One or more	0.051 (0.124)	1.08	0.054 (0.125)	1.09	0.054 (0.122)	1.09
	Income in thousands		0.001 (0.002)	1.00	0.001 (0.002)	1.00	0.001 (0.002)	1.00
	Emergency loan	Unavailable	0.009 (0.104)	1.02	0.009 (0.109)	1.01	0.01 (0.112)	1.02
	House payment	Delinquent	0.286 (0.127)*	1.58	0.288 (0.129)*	1.59	0.283 (0.129)*	1.57
		Moved	0.143 (0.109)	1.26	0.147 (0.106)	1.27	0.145 (0.102)	1.26
Refinanced		-0.003 (0.095)	1.00	0.002 (0.096)	1.00	0.005 (0.09)	1.01	
Adverse Events	Family breakup	Yes (became single)	-0.042 (0.343)	0.94	-0.038 (0.342)	0.94	-0.022 (0.343)	0.96
	Employment	Unemployment Spell	0.202 (0.102)*	1.38	0.202 (0.102)*	1.38	0.212 (0.104)*	1.40
	Unexpected expense	Yes	0.181 (0.062)*	1.34	0.188 (0.065)*	1.35	0.187 (0.063)*	1.35
	Medical expenses	Difficulty Paying	0.271 (0.067)*	1.54	0.264 (0.068)*	1.53	0.268 (0.066)*	1.53
	Negative income shock	Yes	0.24 (0.102)*	1.47	0.239 (0.102)*	1.47	0.244 (0.1)*	1.48
Financial Gain	Financial benefit of filing		0.013 (0.002)*	1.02	0.013 (0.002)*	1.02	0.013 (0.002)*	1.02
External Forces	Local unemployment rate		-0.006 (0.023)	0.99	-0.013 (0.023)	0.98	-0.025 (0.022)	0.96
	Local house prices		-0.011 (0.006)*	0.98	-0.011 (0.006)*	0.98	-0.013 (0.006)*	0.98
	Wage Garnishment policy	State Protects Wages	-0.146 (0.104)	0.79	-0.035 (0.085)	0.95	-0.021 (0.087)	0.97
	BAPCPA	Before November 2005	0.13 (0.231)	1.23	-0.178 (0.285)	0.75	0.375 (0.2)*	1.82
	Bankruptcy rate of county				0.182 (0.037)*	1.34	0.34 (0.067)*	1.73
	BAPCPA X Bankruptcy rate						-0.348 (0.1)*	0.57
Model Statistics	Intercept		-79.535 (88.071)		-8.648 (99.701)		-9.923 (90.018)	
	QIC		1,096		1,089		1,080	
	QICu		1,110		1,107		1,102	

Notes: We present Table A1 for purposes of comparison only. Except for missing data, the analytic procedures used for Table A1 are identical to those used in Table 6. In Table A1 models above, missing data was handled through listwise deletion, which reduced by more than 60% the number of bankruptcies (116) and overall cases (6,524) and produced higher standard errors than those shown in Table 6. Consequently, we prefer the models in Table 6 to those in Table A1 above.

