



# WORKING PAPERS

RESEARCH DEPARTMENT

**WORKING PAPER NO. 08-14  
THE HOMEOWNERSHIP EXPERIENCE OF  
HOUSEHOLDS IN BANKRUPTCY**

Sarah W. Carroll  
University of Pennsylvania Law School

Wenli Li  
Federal Reserve Bank of Philadelphia

August 4, 2008

RESEARCH DEPARTMENT, FEDERAL RESERVE BANK OF PHILADELPHIA

Ten Independence Mall, Philadelphia, PA 19106-1574 • [www.philadelphiafed.org/econ/index.html](http://www.philadelphiafed.org/econ/index.html)

# The Homeownership Experience of Households in Bankruptcy\*

Sarah W Carroll

University of Pennsylvania Law School

saca@law.upenn.edu

Wenli Li

Federal Reserve Bank of Philadelphia

wenli.li@phil.frb.org

August 4, 2008

---

\*We are grateful to Mitchell Berlin, Ronel Elul, Hulya Eraslan, Bob Hunt, Melissa Jacoby, Geng Li, and Michelle White for their comments and suggestions. We also thank seminar participants at the Philadelphia Federal Reserve Bank, the 2008 American Law and Economics Association Annual Meeting, and the 2008 Federal Reserve System Applied Micro Meeting. Finally, we are indebted to the New Castle County Sheriff's Office, Mr. Chris McBride in particular, and the Reinvestment Fund of Delaware for providing us with their data and assistance. The views expressed in this paper do not necessarily represent those of the Federal Reserve Bank of Philadelphia or the Federal Reserve System. This paper is available free of charge at [www.philadelphiafed.org/econ/wps/index.html](http://www.philadelphiafed.org/econ/wps/index.html).

## Abstract

This paper provides the first in-depth analysis of the homeownership experience of households in bankruptcy. We consider households who are homeowners at the time of filing. These households are typically seriously delinquent on their mortgages at the time of filing. We measure how often they end up losing their houses in foreclosure, the time between bankruptcy filing and foreclosure sale, and the foreclosure sale price. In particular, we follow homeowners who filed for chapter 13 bankruptcy between 2001 and 2002 in New Castle County, Delaware, through October 2007. We present three main findings. First, close to 30 percent of the filers lost their houses in foreclosure despite filing for bankruptcy. The rate rose to over 40 percent for those who were 12 months or more behind on their mortgage payment, about the same fraction as among those who entered into foreclosure directly. Second, filing for bankruptcy allowed those who eventually lost their houses to foreclosure to remain in their houses for, on average, an additional year. Third, although the average final sale price exceeded borrowers' own estimates at the time of filing, the majority of the lenders suffered losses. These findings are pertinent to the recent debate over the bankruptcy code on mortgage modification. Finally, the paper also reports circumstances related to the loan, borrower, and lender that make it more or less likely that a certain result will take place.

JEL Classifications: J22, K35, D14

Keywords: Homeownership, Chapter 13 Personal Bankruptcy, Foreclosure

# 1 Introduction

The residential mortgage delinquency rate and foreclosure rate have risen drastically over the last two years as the nation’s housing market recession has deepened. Millions of people have lost their homes through foreclosure or are on the brink of losing them. As a result, personal bankruptcy has attracted increasing attention as a potential legal system of last resort to cure delinquent mortgages. There is, however, substantial debate as to the extent of the relief the current bankruptcy system is able to offer to homeowners. Many people argue that the current debt relief system is insufficient because it does not allow for mortgage loan modification secured solely by the debtor’s principal residence. Indeed, several bills are pending in Congress aiming to change precisely that.<sup>1</sup>

The legal profession, on the other hand, has long recognized that even in its current form, personal bankruptcy overrides lenders’ contractual and legal rights to pursue foreclosure. Filing for bankruptcy automatically stops foreclosure. Moreover, by discharging unsecured debt, bankruptcy leaves borrowers with more available income for mortgage payments, which decreases the risk that their homes will be encumbered by judgment liens. Chapter 13 bankruptcy even allows the filer to cure a mortgage arrearage over a several year period while continuing to make regular mortgage payments in accordance with the contract.

Prior to this analysis, it has been difficult to talk sensibly about whether the current system provides homeowners with “enough” protection because we simply did not know the homeownership experience of bankrupt households. As Jacoby (2007) points out,

“No one has specifically tracked the outcomes for chapter 13 filers who file for the purpose of saving their homes from foreclosure ...”

Economic scholars have not traditionally viewed personal bankruptcy, chapter 13 in particular, as a mortgage borrower protection mechanism. The existing literature has generally examined the impact of bankruptcy exemption on mortgage lending (Berkowitz and Hynes 1999, Lin and White 2001, Pence 2006, and Chomsisengphet and Elul 2006). While some researchers are aware of the role bankruptcy protection plays in borrowers’ default and foreclosure decisions, they tend not to build bankruptcy explicitly into their analysis (Ambrose, Buttimer, and Capone 1997, and Capozza and Thomson 2006). The few exceptions are Bahchieva, Wachter, and Warren (2005), Long (2005), White and Zhu (2008), and Levitin and Goodman (2008). Bahchieva, Wachter, and Warren (2005) document the mortgage indebtedness of bankruptcy filers. Long (2005) examines bankruptcy filings’ long-run negative

---

<sup>1</sup>Scarberry (2007) gives a summary and comparison of mortgage reform bills currently pending in Congress. These bills, if passed, would expand bankruptcy tools with the goal of encouraging modification of subprime mortgages within the structure of the banking system.

effects on households' access to credit. White and Zhu (2008) build a theoretical model to explore households' joint decision of bankruptcy and mortgage default. Levitin and Goodman (2008) study interest rate variation by property type as the current bankruptcy code only allows for mortgage strip-down on non-single-family owner-occupied properties.

Similarly, despite ample evidence on mortgage foreclosure outcomes (Ambrose, Buttimer, and Capone 1997, Stark 1997, Lambrecht, Perraudin, and Satchell 2003, Grover, Smith, and Todd 2006, Pennington-Cross 2006, and Gerardi, Shapiro, and Willen 2007), few studies track bankruptcy outcomes, especially the outcomes of chapter 13 bankruptcy filings. Of those that do, none follow up on homeownership experience during and after bankruptcy (Norberg and Velkey 2007, and Eraslan, Li, and Sarte 2007).

In this paper, we build a unique dataset that allows us to track the homeownership experience of homeowners who filed for bankruptcy between August 2001 and August 2002 in New Castle County, Delaware. We construct three measures of homeownership experience by asking the following questions: How often do people lose their houses to foreclosure during and after bankruptcy? How much time elapses between a bankruptcy filing and the foreclosure sale? What is the foreclosure sale price in the event that the house does end up in foreclosure? The first measure gives us a sense of homeownership sustainability during and after bankruptcy, while the second and third measures shed light on the potential gains and losses to homeowners and lenders that result from foreclosure during and after bankruptcy.

We have three main findings. First, despite having filed for bankruptcy, close to 30 percent of the filers lost their houses to foreclosure sale by October 2007. The foreclosure sale rates jumped to 39 percent and 41 percent, respectively, for filers who were over 6 or 12 months delinquent on their mortgage payments at the time of filing. Second, filing for bankruptcy allowed those who eventually lost their houses to remain there for 26 months, on average. Third, average final sale prices exceeded borrowers' own estimates at the time of filing, a result due largely to the run-up in house prices in the early periods of our sample. Despite this, most lenders did not collect enough money to cover the total mortgage outstanding as well as mortgage arrearage and, thus, suffered losses up to 30 percent of the amount they were owed.

Our first result helps address the question: Does bankruptcy reduce foreclosures by giving borrowers breathing space? For comparison, we follow houses that the New Castle County Sheriff's Office listed as in foreclosure sale but whose owners did not file for bankruptcy between August 1, 2001, and August 1, 2002. We find that roughly 43 percent of the owners had their houses foreclosed by October 2007. This rate, though higher than the foreclosure rate of our overall sample, is not very different from that observed among homeowners who were 12 months or more delinquent on their mortgage payments at the time of bankruptcy

filing.

Our second result confirms some earlier findings in the literature: loans that transition from delinquency into bankruptcy simply take longer to reach their ultimate resolution – foreclosure, in the case of mortgage loans (Capozza and Thompson 2006).<sup>2</sup> Specifically, bankruptcy adds, on average, one year to delinquent mortgage debtors’ stays in their house.<sup>3</sup> Time to sale for a foreclosed property is negatively correlated with its eventual sale price.

Our third result has several interesting implications. First, contrary to many conventional views, borrowers in our sample appear not to be overly optimistic about their houses’ values, having estimated their values at less than what ultimately materialized in the market. Their houses often fetched a higher price in foreclosure than their estimated market value at the time of bankruptcy filing, even though many of the houses were sold at fire sale prices. Second, the majority of lenders suffered losses, despite relatively high sale prices and even without taking the further accumulation of mortgage arrears into account. Together with considerable administrative fees, trustee commissions, and legal expenses, these results suggest significant social losses. Specifically, after adjusting for inflation, we find that the average loss for the lender is \$13,903 per home and the median loss is \$5,303. Assuming an additional 20 percent foreclosure fee, the loss increases to \$35,334 for the average house and \$23,215 for the median. Put it in relative terms, lenders lost on average 30 percent of the amount that was owed to them.

Finally, our paper identifies borrower, lender, and loan characteristics that affect homeownership outcomes. To highlight some of the results, we find that borrowers who are seriously delinquent in their mortgages, highly leveraged, or have suffered spells of unemployment are more likely to lose their houses during or after bankruptcy. By contrast, being married and having an experienced attorney reduce the hazard rate of homeownership loss. Interestingly but not surprisingly, the time between bankruptcy filing and property foreclosure sale is determined by the number of payments borrowers have missed on their mortgages, attorney experience, and, to some extent, whether the mortgage is serviced by a servicer. The relative sale price, by contrast, is largely determined by the neighborhood housing market and economic situation as well as characteristics of the property itself. Whether the mortgage loan is serviced by a loan servicer reduces the time between the end of bankruptcy and foreclosure sale but does not affect foreclosure sale price.

---

<sup>2</sup>Capozza and Thompson (2007), however, do not distinguish between chapters 7 and 13. By the nature of the system, chapter 13 filers may still be in bankruptcy eight months after a 90-day delinquency. Thus, the relevance of their continued presence in bankruptcy over an eight-month period is difficult to interpret.

<sup>3</sup>Since most filers for bankruptcy were already seriously delinquent on their mortgages, without bankruptcy filing, it is reasonable to assume that they would be in foreclosure very soon. Indeed, at the time of filing, about 27 percent of households in our sample were already in foreclosure.

Taken together, our results suggest that personal bankruptcy does appear to provide homeowners with additional breathing room to try to cure their delinquent mortgages, but it does not appear to protect homeownership in the long run or housing values for lenders. What does this tell us about recent proposals to use the bankruptcy process to protect homeownership? One possibility is that existing mechanisms to avoid foreclosure in bankruptcy need to be strengthened, as proponents of recent legislation argue. The alternative is that households entering bankruptcy were likely to lose their houses under any circumstances, including expanded opportunities to modify contracts in court. Our evidence provides no support for the first possibility and lends some credibility to the second possibility. Further research is necessary to resolve these issues. To conclude, this paper, to the best of our knowledge, represents the first in-depth analysis of the homeownership experience of households in bankruptcy, a necessary first step toward evaluating policy options.

The rest of the paper is organized as follows. We discuss details regarding foreclosure and bankruptcy laws in Section 2. We describe bankrupt households' characteristics in Section 3. We report on these households' homeownership experience in section 4 and the determinants of their homeownership outcomes in section 5. Section 6 concludes.

## **2 Institutional Background**

### **2.1 Foreclosure Laws**

When a borrower defaults on a home mortgage, the lender may attempt to recover its losses by repossessing and selling the property. This act is governed by state property laws regarding the judicial foreclosure process, statutory rights of redemption, and deficiency judgments.

There are two widely used types of foreclosure. Foreclosure by judicial sale is available in every state, and it is the required method in many, including Delaware. Within this framework, the mortgaged property is sold under the supervision of a court, with the proceeds going first to satisfy the mortgage, then to satisfy other lien holders, and finally to the borrower. The second type of foreclosure is foreclosure by power of sale. Here, the mortgage holder is permitted to sell the property without court supervision. Where it is available, foreclosure by power of sale is generally faster than foreclosure by judicial sale.

After the foreclosure sale is complete, the homeowner can still regain the property if his state grants a statutory right of redemption. Up to a year after the sale, depending on the state, homeowners can redeem their property for the foreclosure sale price plus foreclosure expenses. In Delaware, there is no right to redeem after the confirmation of the sheriff's sale

except for tax foreclosure. If the sale proceeds do not pay off the existing mortgage on the property plus costs, most states, including Delaware, allow the lender to collect a deficiency judgment equal to the lender's foreclosure losses against the borrower's other assets.

## **2.2 Homeowner Protection under Bankruptcy Law**

The current personal bankruptcy law contains two chapters: chapter 7 and chapter 13. Filing for bankruptcy under either chapter imposes an automatic stay on all collection efforts by lenders, which includes foreclosure that is already in progress. The stay can only be lifted by the court during bankruptcy or after the bankruptcy case is terminated.

Chapter 7, the more frequently utilized option, discharges filers' unsecured debt but requires them to surrender any assets that exceed state exemptions. For homeowners that have built up home equity, there is a risk that the trustee may sell the home and distribute any equity that exceeds the state homestead exemption to creditors. Chapter 7 personal bankruptcy, nevertheless, has implications for mortgage protection. For example, discharging debt under chapter 7 affords borrowers who have not defaulted on their mortgages or who have reached work-out agreements with their lenders more available income to make their mortgage payments, thus protecting their homes from judgment liens.

Unlike chapter 7, chapter 13 permits a defaulting mortgage borrower to propose a plan to cure a mortgage arrearage over time while continuing to make regular mortgage payments outside the plan. If the court confirms the plan, the automatic stay will protect the borrower until the plan is completed, the plan fails and the case is dismissed, or the plan is converted to chapter 7. In the latter two cases, lenders will often petition to have the automatic stay removed. A chapter 13 repayment plan typically lasts for 3 to 5 years. Even homeowners with substantial equity can save their homes by making more payments to unsecured creditors instead of subjecting their houses to sale as under chapter 7. Therefore, chapter 13 overrides lenders' contractual and legal rights to pursue foreclosure. For the remainder of the paper, we concentrate on chapter 13, as it provides the stronger form of mortgage protection.<sup>4</sup>

## **3 Bankrupt Households' Characteristics**

### **3.1 Data**

Our data come from four different sources. The main dataset contains information on all of the chapter 13 personal bankruptcies that were filed between August 1, 2001, and August 1,

---

<sup>4</sup>For further discussion of the treatment of homeowners in bankruptcy prior to 2005, see White (1998), Berkowitz and Hynes (1999), Lin and White (2001), and Bahchieva, Wachter, and Warren (2005).



2002, in New Castle County, Delaware. We collected these data using an electronic service that grants public access to case and docket information from federal bankruptcy courts and the U.S. Party/Case Index, commonly known as Public Access to Court Electronic Records (PACER). This service offers bankruptcy court information including: i) a listing of all parties and participants, including judges, attorneys, and trustees, ii) a chronology of all events entered in the case record, iii) a claims registry, and iv) the types of documents filed for specific cases and imaged copies of these documents.

The docket sheet and court files allow us to extract important dates that mark the chapter 13 bankruptcy procedure, including the filing date, the confirmation date, and the dismissal or discharge date as well as filers' financial and income information at the time of filing and the final outcome of the case. The court files include debtor petitions, attorney disclosure forms, statements of financial affairs, chapter 13 plans, and trustee reports. Each debtor's petition contains schedules labeled A through J that set forth his or her financial situation, including real property ownership; other personal assets in the form of furniture, cash, or insurance; liabilities such as secured debt and unsecured priority debt (taxes); and maintenance expenses.<sup>5</sup>

Using property addresses and owners' names, we linked this bankruptcy dataset with a foreclosure sale database provided by the Sheriff's Office in New Castle County, Delaware. The sheriff's sale dataset lists the sale date, plaintiff, defendant, attorney for the plaintiff, mailing address, and outcome of each foreclosure filing from July 2001 to October 2007. We added foreclosure sale price, as well as the price and date of the last sale before foreclosure, to this database using information provided by The Reinvestment Fund of Delaware (TRF). Knowing the last sale date before foreclosure allows us to calculate owners' tenure in their houses. We obtained the sale histories for properties that did not end up in foreclosure sale and for which TRF does not have price information from the New Castle County Recorder of Deeds.

Finally, we obtained local economic and housing market information by merging 2000 census survey results with our data, using property zip code as the key. This information includes homeownership rate, average household size, labor force participation rate, percentage of people below the poverty line, median family income, median house value, and median monthly housing costs for mortgaged properties.

---

<sup>5</sup>The court files are mostly "pdf" images from which information cannot be directly extracted using software. We manually collected all of our data by downloading these images and coding them into a database. The data were entered twice and the corresponding entries were cross-checked. The data were also checked against different sources where the same information was reported. For instance, the summary of schedules provides headline numbers on filers' assets, debts, income, and expenditures, while petition schedules A through J provide the same information in greater detail.

## 3.2 Profiles of Bankrupt Households

Between August 1, 2001, and August 1, 2002, there were 756 chapter 13 bankruptcy filings in New Castle County, Delaware, about 70 percent of all of the chapter 13 bankruptcies filed in Delaware during that period. Of the 756 filers, 611 owned homes at the time of filing. We exclude filers who owned multiple properties from our sample since many of these filers appear to be speculators. We also delete observations with incomplete information on filers' basic income and balance sheets due to filer reporting or court recording errors, as well as observations with missing housing price information from TRF and the Recorder of Deeds. The final sample has 567 observations. Of the 567 filers, 291 finished repayment plans successfully and obtained discharge,<sup>6</sup> 11 converted to chapter 7 and obtained discharge there, and the rest were dismissed under chapter 13.

At the time of filing, bankruptcy filers in our sample have owned their houses for an average of 7.5 years. The median house tenure is five years, and about 7.5 percent of the filers have owned their houses for less than one year (Figure 1.a). Twenty-seven percent of filers are already in the foreclosure process. We proxy the number of months of mortgage delinquency by dividing the total mortgage arrears (including interest) by the reported monthly mortgage expenses, which often include tax payment. According to our calculation, over 80 percent of the borrowers in our sample are delinquent on their mortgages at the time of filing, with an average length of delinquency of 10 months (Figure 1.b).<sup>7</sup> Moreover, mortgage borrowing at the point of filing approaches or exceeds the value of most bankrupt homeowners' homes. The average mortgage loan-to-value ratio (LTV) is 0.97,<sup>8</sup> and more than half of the filers have mortgage debt equal to or in excess of the estimated value of their home at the time of filing, suggesting that most homeowners did not go into bankruptcy to protect their home equity but rather to "hold on to their houses." (Figure 1.c).<sup>9</sup> Even for those who have lived in their current houses for over 10 years, the average mortgage LTV is 0.94, contrary to expectations.

---

<sup>6</sup>The plan completion rate among our final sample, at 51 percent, is much higher than the 44 percent discharge rate for the whole sample. See Eraslan, Li, and Sarte (2007).

<sup>7</sup>Porter (2007) finds that mortgage companies often impose unreasonable fees and charges on mortgage claims without borrowers' knowledge. Thus, our calculation of months of mortgage default based on bankruptcy files may overstate the true length of mortgage delinquency.

<sup>8</sup>The 0.97 average LTV among our bankruptcy homeowners is substantially higher than the 0.78 and 0.91 mean LTV at filing among bankruptcy homeowners in 1991 and 2001 as reported by Surveys of Bankruptcy Petitioners.

<sup>9</sup>As Bahchieva, Wachter, and Warren (2005) find, using interview data of 400 bankrupt homeowners in 2001, homeowners in financial trouble are extremely reluctant to give up their homes even when it is financially rational to do so; many homeowners in bankruptcy describe themselves as trying to save their homes even when their own description of the value and the mortgage amounts would suggest they should abandon it.

And the average mortgage LTV dropped only to 0.90 for homeowners with house tenure of over 15 years. These data imply that high mortgage LTVs among bankrupt homeowners are not entirely attributable to high LTVs at the onset or brief tenure since exotic mortgage contracts such as interest only and reverse mortgages are more of a recent phenomenon. These homeowners must have refinanced and increased the outstanding principal on their mortgages before they filed for bankruptcy.

The majority of the filers' debt is in mortgages, 71 percent for the mean filer and 74 percent for the median, comparable to the national average reported by the 2001 Survey of Consumer Finances. Their monthly mortgage payments average about 33 percent of their reported monthly income net of insurance and payroll deductions (Figure 1.d), far exceeding the 11 percent national average for homeowners reported by the Board of Governors of the Federal Reserve (see <http://www.federalreserve.gov/releases/housedebt/>).<sup>10</sup> Interestingly, however, mortgage arrears account for only about one-third of total debt in default, with the latter calculated as the sum of mortgage arrears and unsecured priority and nonpriority debt. To identify subprime loans, we employ a commonly used methodology, using a 2001 U.S. Department of Housing and Urban Development (HUD) listing that classifies lenders as generally making either prime or subprime loans (see: [www.huduser.org/datasets/manu.html](http://www.huduser.org/datasets/manu.html)).<sup>11</sup> According to this classification, subprime lenders originate or service about 15 percent of our mortgage loans. We further distinguish lenders as local or nonlocal by defining local lenders as those with headquarters in Delaware, Pennsylvania, or Washington, D.C. According to our classification, about 8.1 percent of the lenders are local. In addition, we are able to single out borrowers who make their payments to mortgage servicers based on the name of their mortgage lenders; i.e., we classify a lender as a servicer if its name contains words such as "service" or "servicer." Roughly 4.2 percent of the borrowers in our sample make payments to loan servicers.

Table 1 summarizes this information. This table also reports information related to borrowers' demographics, income, assets, and liabilities. Compared to other Delaware residents, borrowers in our sample are less likely to be married, with 43 percent of the sample being recorded as married, versus 54 percent of the state of Delaware overall. Approximately 16 percent of the filers list alimony as part of either their monthly income or monthly expenses, suggesting a recent divorce. About 4 percent have experienced a recent unemployment spell,

---

<sup>10</sup>The two ratios are not exactly comparable, since the mortgage payment number in our data often contains property taxes and the income number is after payroll and insurance deductions. But it is highly unlikely that these definition differences will make up for the over 20 percent difference in mortgage debt service ratio between our bankruptcy sample and the national average.

<sup>11</sup>The methodology, though imperfect, is widely used by, among others, the Federal Reserve and Harvard University's Joint Center for Housing Studies.

slightly less than the 5 percent state unemployment rate.<sup>12</sup> In addition, one-fourth of the filers have prior bankruptcy experience.

As expected, the level of these borrowers' indebtedness is striking. Specifically, their total debt has a median of \$137,848, around nine times the national median indebtedness of homeowners, while their median total financial and nonfinancial assets are \$114,901, about 84 percent of the corresponding national median. Their median unsecured debt is \$16,814, compared to a national median of \$0 for homeowners. We estimate a lower bound for medical debts by flagging keywords such as "health," "medical," and "Labcorp" that are listed either as the debt type or the associated creditor. This lower bound estimate comes to \$1141 for the average filer and \$2915 for the average filer who reported positive medical debt. More than one third of the borrowers report positive medical debts.

Furthermore, we define attorney experience based on in-sample frequency for both borrowers in bankruptcy and lenders pursuing foreclosure. In particular, if an attorney participates in 25 or more of the cases in the sample, then we classify the attorney as being experienced. A borrower who files bankruptcy by himself, i.e., pro se, is equivalent to having an inexperienced attorney. All lenders are represented by attorneys in foreclosure. As can be seen in Table 1, foreclosure cases are mostly handled by the same group of lawyers. Additionally, about 3 percent of foreclosure cases list the county government as the plaintiff. In New Castle County, local governments can foreclose in the event of nonpayment of taxes, sewer and water costs, and other fees such as vacancy fees and mitigation costs. Redemption rights are denied to foreclosed homeowners except for tax lien foreclosures.

Filers in our sample live in areas spanning 27 five-digit zip codes. We take the ratio of the filer's estimated home value and the local median home value. Similarly, we calculate filers' income relative to the regional median. Finally, we calculate, for each zip code, the ratio of median housing costs to median home value. All these measures are meant to capture local house buying and mortgage lending conditions, which determine how long it takes to auction a house and for how much it will sell.

There are substantial economic differences across regions. For example, average household annual income is \$17,679 in the poorest neighborhood and \$105,971 in the richest neighborhood. Similarly, the adult labor force participation rate varies between 41.8 percent and 77.6 percent, and the proportion of families living below the poverty line ranges from 0.9 percent to 24.1 percent. Homeownership rates vary between 32 percent and 96 percent. Median home values also vary substantially, from \$71,100 to \$415,200. Median housing costs for mortgaged properties range from \$858 a month to \$2,385 a month. Median

---

<sup>12</sup>This observation is consistent with chapter 13 requirement that filers need to have a regular job for a meaningful repayment plan.

household size also varies between 1.66 and 3.01.

## 4 The Homeownership Experience of Bankrupt Households

We construct three quantitative measures to capture the homeownership experience of bankruptcy filers. These are:

**House tenure:** For the purpose of this study, we define house tenure as whether borrowers lost their current houses to foreclosure during the period of our observation. Few households sold their houses voluntarily within chapter 13 plans. We thus treat these debtors the same as those who remained homeowners through the end of our sample period. Note that our house tenure definition refers to parting with ownership of a particular property. This need not be construed as a permanent return to the rental sector.

**Time to foreclosure:** For those whose homes ended up being sold in foreclosure, we measure the time to foreclosure by calculating the gap between the foreclosure sale date and the bankruptcy filing date.

**Foreclosure sale price:** We use the sheriff's sale price as the foreclosure sale price if the house was sold to a third party. If the sale was a lender buy-back, we use the price at which the lender subsequently sold the house to a third party. In a few cases, we observe a symbolic \$10 sale price when the lender sold its repossessed house to another institution. We exclude these cases from our analysis of sale prices.

Table 2 presents summary statistics of these three measures. Close to 30 percent of debtors lost their houses to foreclosure despite filing for bankruptcy. The foreclosure sale rate rose to 39 percent for those who had been delinquent on their mortgages for six months or more at the time of filing, and to 41 percent for those who had been delinquent on their mortgages for 12 months or more. Although not directly comparable, we examine homeowners whose houses were listed as in foreclosure sale between August 1, 2001, and August 1, 2002, and who did not file for bankruptcy. We find that 43 percent of this group lost their houses to foreclosure by October 2007. The comparison, though far from ideal, suggests that bankruptcy does not help homeowners keep their houses.

The majority of the auction sales were lender buy backs (i.e., the sheriff's auction didn't generate a third-party sale) though most of the lender buy back properties were sold to

third parties within one year. Interestingly but not surprisingly, 11 percent of those who completed their chapter 13 payment plans successfully and hence had their debt discharged still lost their houses to foreclosure by October 2007, while 45 percent of those who failed to carry out their chapter 13 repayment plans successfully and hence were dismissed in the bankruptcy court lost their houses to foreclosure sale (not on the table). We did not find strong evidence that homeowners were merely using chapter 13 as a way to catch up with their mortgage payments with no intention or ability to carry out the chapter 13 repayment plan to its full length. About 17 percent of those who were dismissed but did not lose their houses to foreclosure sales were voluntary dismissal.

The time-to-sale measurement of bankruptcy filers' homeownership experience captures the tension between borrowers and lenders in foreclosure sale. When the ultimate outcome is foreclosure sale, the longer a homeowner stays in his house without making proper payments, the more benefits the homeowner enjoys, and the greater cost the lender bears. In our sample, the average time between bankruptcy filing and foreclosure sale is about 28 months. On balance, the longer a filer has been delinquent at the time of bankruptcy filing, the shorter the time to foreclosure. However, even for filers who were already one year delinquent on their mortgage payments at the time of filing and who, without filing for bankruptcy, would most likely be in foreclosure already, the average foreclosure sale did not occur for 26 months. Alternatively, if we focus on those households that were already in foreclosure at the time of bankruptcy filing, the average foreclosure sale also did not occur for 26 months. This is 10 months longer than the average foreclosure sale recorded by the sheriff's office between 2001 and 2007. Furthermore, to isolate the worst of the non-filers to see if they look more like filing homeowners, we study the foreclosure length at the 75 percentile for our non-filer homeowners. The length is 20 months, still half a year shorter than the foreclosure length of our bankruptcy sample. This finding is consistent with Capozza and Thomson (2006), who tracked a sample of seriously delinquent subprime mortgages for eight months starting in 2001 and found that loans that transition from delinquency into bankruptcy ultimately resolve in foreclosure and eventual disposition of the real estate collateral (REO), but the time to get there can be quite extended. The average time between the termination of a bankruptcy case and the foreclosure sale is about 11 months (not on the table).

Foreclosed houses in our sample fetched, on average, \$97,241 in 2001 dollars, less than the average \$121,149 for which other foreclosed houses were sold between 2001 and 2007 in New Castle County. Third-party sales generated higher median prices but lower average prices than lender buy backs. Longer time-to-sale is also associated with lower sale price; the correlation coefficient of the gap between bankruptcy filing and foreclosure sale and the final foreclosure sale price adjusted for inflation (to third parties) and house price growth is

−0.16.

Finally, in nominal terms, the foreclosure sale price generally exceeded the estimates that owners made when they filed for bankruptcy due to the overall run-up in house prices during that period. This result remains true even in real terms and contradicts the belief that mortgage borrowers have tended to be overly optimistic about their property values over the last 10 years. After we adjust for house price growth using the OFHEO house price index for Delaware, the real sale price falls to about 90 percent of what homeowners estimated when they filed for bankruptcy. If we take into account mortgage outstanding and mortgage arrearage accumulated at the time of the filing, the sale price averaged about 88 percent of the total amount outstanding, and over 70 percent of the lenders did not recover their losses. The ratio increases if we consider the 20 percent housing transaction fee.<sup>13,14</sup> Put differently, if we assume that the mortgage outstanding at filing did not accumulate any additional interest or penalty, and if we adjust for inflation, we find that the average loss to the lender is \$13,903 per household and the median loss is \$5,303. Assuming a 20 percent transaction cost, the loss increases to \$35,334 for the average household and \$23,215 for the median. The losses would be even greater if we took the time cost of money into account.

Figure 2 panels a, b, c, and d chart the distribution of the time between foreclosure sale and bankruptcy filing and between foreclosure sale and bankruptcy termination, as well as the ratio of sale price to estimated property value at the time of bankruptcy filing and the ratio adjusted for inflation.

## 5 Determinants of Homeownership Outcome

### 5.1 Methodology

In this section, we analyze circumstances related to the loan, borrower, and lender that affect the probability that a certain homeownership result will occur. To that end, we employ Heckman’s two-step estimation technique to adjust for selection bias, since we only observe time to foreclosure and foreclosure sale price for properties that were sold through foreclosure.

---

<sup>13</sup>Grover, Smith, and Todd (2006) also find in their 2002 sample of mortgage foreclosures in Hennepin and Ramsey counties in Minnesota that the strong and appreciating housing market in the early 2000s had a positive effect on the sheriff’s foreclosure sale price. Contrary to our findings on bankruptcy sample, however, they find that most foreclosed properties were sold for more than the outstanding amount due on the mortgage for the foreclosure sample.

<sup>14</sup>Stark (1997) found that the costs amounted to 19.1 percent of the final judgment amount – the amount mortgage borrowers owed to lenders – in 1993 foreclosure sales cases and 18.43 percent of the final judgment in the 1994 sale cases.

In the first step, we conduct a Probit estimation of the selection equation that determines whether the bankruptcy filer lost his house in foreclosure by the end of our sample period. In the second step, we augment the regression equation with the nonselection hazard and obtain the parameter estimate. A consistent estimate of the regression disturbance variance is obtained using the residuals from the augmented regression and the parameter estimate on the nonselection hazard. See Heckman (1979) for more details.

## 5.2 Estimation Results

### 5.2.1 Foreclosure Outcome

The first-stage estimation is a Probit estimation of foreclosure outcome, where we estimate the probability that a filer's house will be foreclosed on during our sample period. Our explanatory variables include information on debtors' housing situations at filing as characterized by months of mortgage delinquency, mortgage LTV, house tenure, whether the filer was already in foreclosure at the time of bankruptcy filing, and if so, whether the foreclosure was initiated by government (foreclosure due to delinquent taxes); mortgage lender information, such as whether HUD characterizes the mortgage lender as a subprime lender, whether the lender is local (i.e., headquartered in Delaware, Pennsylvania, or Washington, D.C.), whether the mortgage is serviced by a servicer, and lender attorney experience; household characteristics, such as previous bankruptcy experience, attorney experience, job tenure, marital status, number of dependents, and adverse events the filer may have experienced, such as a recent divorce or unemployment spell; and income and financial information, summarized by monthly mortgage payment as a portion of monthly income, whether the ratio of medical debt to total debt in default exceeds 10 percent, debt in default as a portion of monthly income, and assets relative to total debt. We also include local economic information such as the local homeownership rate, the adult labor force participation rate, the percent of households living in poverty, filers' income relative to local median income, filers' house value relative to the local median house value, and local housing maintenance costs (local median housing costs relative to the local house median house value for mortgaged properties).

Table 3 shows the results of the estimation. As expected, the longer a mortgage has been delinquent when the filer declares bankruptcy, the more likely it is that the house will be foreclosed despite the bankruptcy filing. In fact, an additional month of mortgage delinquency increases the probability of foreclosure by 1.20 percentage points. The LTV also affects the probability of foreclosure, with a one percentage point increase in LTV leading to a 0.28 percentage point increase in the probability of foreclosure. If the filer



is already in foreclosure at the time of the bankruptcy filing, the probability of a later foreclosure significantly increases if the current plaintiff is the county government. None of the other lender characteristics, however, have a notable effect on the probability of foreclosure. Among demographics, being married decreases the probability of foreclosure. Adverse events, such as unemployment, increase the likelihood of foreclosure significantly. The probability of foreclosure decreases significantly if either the filer or the lender has an experienced attorney, as foreclosure is a costly outcome for both parties. Among financial and income variables, a higher monthly mortgage payment relative to income increases the probability of foreclosure. None of the other income and financial information, such as debt in default relative to monthly income and assets relative to debt, affects the probability of foreclosure, though the variables' coefficients have the expected signs. None of the regional economic variables matter, with the exception of housing costs: in areas with higher local housing costs, it is more likely that the filer will lose his house to foreclosure.

### 5.2.2 Time to Sale

Table 4 reports our second-stage estimation results concerning the time between foreclosure sale and bankruptcy filing. We present results with and without the Heckman selection bias adjustment, and they look very similar. Explanatory variables in this stage include months of mortgage delinquency at the time of bankruptcy filing; the same lender information used in the first stage, such as whether the lender is a subprime mortgage lender, whether the lender is headquartered in Delaware, Pennsylvania, or D.C., and whether the debtor makes payments to a loan servicer; if the filer is already in foreclosure, whether the foreclosure was initiated by the local government; filer attorney experience; lender attorney experience; and local zip code-level economic information summarized by the local homeownership rate, the labor force participation rate, the poverty rate, the average household size, local housing costs as a percentage of median house value, filers' income relative to the local median household income, and filers' estimated house values relative to the median local house value. The other variables, such as filers' income and financial information, as well as demographics, affect the time to sale only through their impact on the probability of the house being foreclosed.<sup>15</sup>

Among all these variables, the ones that explain the time to sale at the 5 and 10 percent statistical significance levels are the number of payments the filer has missed when he files for bankruptcy, whether the foreclosure was initiated by the county government due to delinquencies on taxes, and the experience of the filer's attorney. The longer the filer has failed to make his mortgage payments, the more financial stress the filer is likely to be in and

---

<sup>15</sup>Including these income and finance variables directly in the second stage does not affect our estimation results notably.

thus the less time it takes for his house to be foreclosed. By contrast, tax lien foreclosures and the involvement of experienced bankruptcy lawyers substantially lengthen the time between the bankruptcy filing and the foreclosure sale. Tax lien foreclosure in Delaware is the only foreclosure that allows borrowers' redemption right for up to a year. The presence of redemption rights complicates the foreclosure process and discourages potential buyers from purchasing the property. A longer chapter 13 payment plan can be beneficial to filers as it gives them more time to catch up with their delinquent mortgage payments.

As an alternative, we define time to sale as the time elapsed between bankruptcy termination and the foreclosure sale date and repeat the exercise above. The estimation results are reported in Table 5. Interestingly, the amount of mortgage delinquency at the time of bankruptcy filing no longer explains the new time to sale gap. If the lender is a loan servicer, on the other hand, the time between bankruptcy termination and foreclosure sale is substantially shorter. With the exception of large banks, loan servicers often are not the originating banks and they do not bear the direct cost of foreclosure. As a result, they have less incentive to lengthen the foreclosure process in the hope of avoiding it. The experience level of the filer's attorney no longer explains the time to sale, as expected, since the attorney's responsibility is mostly limited to bankruptcy proceedings. Finally, the value of the house relative to the local median house value is an important determinant of the time to sale from bankruptcy termination. The higher the value is, the less time it takes for the house to be sold.

### **5.2.3 Sale Price**

Tables 6 and 7 present the second-stage estimation results regarding sale price. In table 6, the dependent variable is the ratio of sale price to estimated house price at filing, both adjusted for inflation and for local price appreciation. In table 7, the dependent variable is the ratio of sale price to mortgage debt plus mortgage arrearage at filing, adjusted for inflation and for local house price appreciation. In particular, we calculate the growth rate of house prices during the time between the bankruptcy filing and the house's sale using the Office of Federal Housing Enterprise Oversight (OFHEO) house price index for the state of Delaware. We then divide the ratio of the real sale price to real market value of the house at the time of filing or total mortgage balance including arrearage by the growth rate. Note that, for lender buy backs, we use the price at which the lender subsequently sold the property to a third party. In the event that the sale price is booked at a symbolic \$10 or less, we exclude the observation from our estimation.

The explanatory variables in the second stage are exactly the same as those used to estimate time to sale. To reiterate, the variables include months of mortgage delinquency at

the time of bankruptcy filing; the same lender information that was used in the first stage, including whether the lender is a subprime mortgage lender, whether the lender is headquartered in Delaware, Pennsylvania, or D.C., and whether the lender is a loan servicer; if the filer is already in foreclosure, whether the foreclosure was initiated by the local government; filer attorney experience; lender attorney experience; and local zip code-level economic information summarized by the local homeownership rate, the labor force participation rate, the poverty rate, average household size, local housing costs as a percentage of median house value, filers' income relative to the local median household income, and filers' estimated house values relative to the median local house value.

The results appear similar in tables 6 and 7 and with and without the Heckman selection bias adjustment. We start with the estimation results in table 6 with the Heckman selection bias adjustment. Interestingly, the filer's own housing situation does not affect the foreclosure sale price relative to the price at filing. Among lender characteristics, local lenders are able to fetch a higher relative price, likely due to their familiarity with local market conditions. Lender attorney experience also plays an important role in generating a higher foreclosure sale price. Local market conditions are the most important determining factors by far. Specifically, a relatively poor neighborhood with a larger proportion of people living in poverty is likely to generate a lower relative sale price. Foreclosure sales also cause houses on the high end of the market, as measured by their value relative to the local median house value, to suffer more in value. The local homeownership rate is positively correlated with local average household income. Thus, a higher homeownership rate may lead to higher relative auction prices. On the other hand, however, keeping everything else the same, a higher homeownership rate may also indicate a saturated local housing market and, thus, a lower relative auction price. Our estimation indicates that the latter force dominates. Finally, the local average family size may proxy for housing demand, as large families may desire more strongly to own homes. Thus, a larger local average family size might lead to higher relative foreclosure sale prices.

The results in table 7 concerning sale price relative to mortgage balance plus arrearage due at the time of filing are very similar to those in table 6 with the exception that the local homeownership rate is no longer statistically significant.

Before concluding, we explore the robustness of our estimation results. In particular, we restrict our sample to filers who are already delinquent by 90 days or more in their mortgage payments when they file for bankruptcy. In practice, a loan that is 90 or more days delinquent is considered to be seriously in default. In doing this, we restrict our sample to homeowners that are more likely to have filed for bankruptcy to protect their houses. We are left with 418 observations, over 70 percent of the original sample. We then repeat

our regression analysis as above. The new estimation results are similar to our benchmark exercise and we do not report here to save space.

## 6 Conclusions

In this paper, we construct a unique dataset that tracks the homeownership experience of chapter 13 bankruptcy filers for five to six years after their initial filings. Our results have a “glass half full/half empty” quality. In particular, we find that over 40 percent of the filers who had been one year or more delinquent on their mortgages at the time of filing lost their houses to foreclosure, about the same as the portion among those who went into the foreclosure process without filing for bankruptcy. Confirming the conventional belief, we find that filing for bankruptcy adds a little over a year to a normal foreclosure process. Finally, we find that the foreclosure sale price, in nominal terms, exceeds filers’ own estimates at filing, which suggests that, at least in our sample, they did not appear to be overly optimistic about the market value of their property. Nevertheless, over 70 percent of lenders still lost money and the average loss amounts to almost 30 percent of what is owed to the mortgage lender.

Our results suggest that personal bankruptcy does appear to provide homeowners with additional breathing room to try to cure their delinquent mortgages, but it does not appear to protect homeownership in the long run or housing values for lenders. Our analysis lends some credibility to the argument that households entering bankruptcy were highly likely to lose houses under any circumstances, including expanded opportunities to modify contracts in court. Thus, strengthening existing mechanisms to avoid foreclosure in bankruptcy, as proponents of recent legislation argue, may have a modest effect if the characteristics of bankruptcy filing homeowners under the new law are not very different from the existing ones.

Obviously, more detailed, national data and further analysis are needed in order to answer the question of whether personal bankruptcy provides homeowners with real relief directly. Although it is beyond the scope of this paper, it is worth mentioning that, as Jacoby (2008) has argued, perhaps it is more, if not equally, important to also focus on efforts that encourage sustainable homeownership instead of promoting and prolonging homeownership in all instances.

## References

- [1] Ambrose, Brent W., Richard J. Buttimer, Jr., and Charles A. Capone, Jr. 1997. "Pricing Mortgage Default and Foreclosure Delay." *Journal of Money, Credit, and Banking*, 29(3), 314-325.
- [2] Baghchieva, Raisa, Susan Wachter, and Elizabeth Warren. 2005. "Mortgage Debt, Bankruptcy, and the Sustainability of Homeownership," in *Credit Markets for the Poor*, Patrick Bolton and Howard Rosenthal, editors. New York: Russell Sage Foundation.
- [3] Berkowitz, Jeremy, and Richard Hynes. 1999. "Bankruptcy Exemptions and the Market for Mortgage Loans." *Journal of Law and Economics* 42, 908-830.
- [4] Capozza, Dennis, and Thomas Thomson. 2006. "Subprime Transitions: Lingering or M93alingering in Default." *Journal of Real Estate Finance and Economics*, 33(3), 241-258.
- [5] Chomsisengphet, Souphala, and Ronel Elul. 2006. "Bankruptcy Exemptions, Credit History, and the Mortgage Market." *Journal of Urban Economics* 5, 171-188.
- [6] Eraslan, Hulya, Wenli Li, and Pierre-Daniel Sarte. 2007. "The Anatomy of U.S. Personal Bankruptcy Under Chapter 13." Federal Reserve Bank of Philadelphia, Working paper 07-31.
- [7] Gerardi, Kristopher, Adam Hale Shapiro, and Paul S. Willen. 2007. "Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures." Federal Reserve Bank of Boston Working Paper No. 07-15.
- [8] Grover, Michael, Laura Smith, and Richard M. Todd. 2006. "Targeting Foreclosure Interventions: An Analysis of Neighborhood Characteristics Associated with High Foreclosure Rates in Two Minnesota Counties." Federal Reserve Bank of Minneapolis Community Affairs Report 2006-1.
- [9] Heckman, James J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47(1), 153-161.
- [10] Jacoby, Melissa. 2007. "Bankruptcy Reform and Homeownership Risk." *University of Illinois Law Review* 323(1), 323-346.
- [11] Jacoby, Melissa. 2008. "Home Ownership Risk Beyond a Subprime Crisis: The Role of Delinquency Management," *Fordham Law Review*, 76, 2262-95.

- [12] Lambrecht Bart M., William R. M. Perraudin, and Steven Satchell. 2003. "Mortgage Default and Possession Under Recourse: A Competing Hazards Approach." *Journal of Money, Credit, and Banking* 35(3), 425-442.
- [13] Levitin, Adam, and Joshua Goodman. 2008. "The Effect of Bankruptcy Strip-down on Mortgage Markets." Georgetown University Law Center Business, Economics and Regulatory Policy Working Paper Series, Research paper No. 1087816.
- [14] Lin, Emily Y., and Michelle J. White. 2001. "Bankruptcy and the Market for Mortgage and Home Improvement Loans." *Journal of Urban Economics* 50, 138-162.
- [15] Long, Cheryl. 2005. "Negative effects of bankruptcy for home owners: reduced access to credit and lost option value." Manuscript.
- [16] Norberg, Scott, and Andrew Velkey. 2007. "Debtor Discharge and Creditor Repayment in Chapter 13." *Creighton Law Review* 39(3), 473-560.
- [17] Pence, Karen. 2006. "Foreclosing on Opportunity: State Laws and Mortgage Credit." *Review of Economics and Statistics* 88, 177-182.
- [18] Pennington-Cross, Anthony. 2006. "The duration of foreclosures in the subprime mortgage market: a competing risks model with mixing." Federal Reserve Bank of St. Louis, Working paper 2006-027.
- [19] Porter, Katie. 2007. "Mistake and Misbehavior in Bankruptcy Mortgage Claims." University of Iowa Legal Studies Research Paper No. 07-29.
- [20] Scarberry, Mark S. 2007. "Detailed Chart Comparing Provisions of Current Bankruptcy Bills Dealing with Modification of Home Mortgages." [http://www.abiworld.org/pdfs/Home\\_mortgages.pdf](http://www.abiworld.org/pdfs/Home_mortgages.pdf) (accessed February 29, 2008).
- [21] Stark, Debra P. 1997. "Facing the Facts: An Empirical Study of the Fairness and Efficiency of Foreclosures and a Proposal for Reform." *University of Michigan Journal of Law Reform*, 30, 639-688.
- [22] White, Michelle J., and Ning Zhu. 2008. "Saving Your Home in Chapter 13 Bankruptcy." Manuscript.
- [23] White, Michelle J. 1998. "Why Don't More Households File for Bankruptcy?" *Journal of Law, Economics and Organization* 14, 205-231.

Table 1. Data Summary: The Profiles of Bankruptcy Filers

Variable	Mean	Median	S.D.
<i>Mortgages</i>			
House tenure (years)	7.52	5.07	7.34
Already in foreclosure process (%)	27.2		44.5
Months of mortgage delinquency	9.81	8.38	9.12
Mortgage LTV at the time of filing (%)	97.2	98.6	32.5
Monthly mortgage payment (\$)	915	805	488
Monthly mortgage payment/income (%)	33.4	30.7	18.4
Mortgage arrearage/debt in default (%)	34.7	29.7	29.5
Subprime mortgage lender (%)	14.8		35.6
Local lender (%)	8.1		27.3
Mortgage serviced by a servicer (%)	4.2		20.2
Tax lien foreclosure (%)	2.8		16.6
Lender attorney in-sample experience (%)	88.5		31.9
<i>Demographics</i>			
Married (%)	43.0		49.6
Recently divorced (%)	16.4		37.1
Job tenure (years, current job)	5.2	1	8.1
Self-employed (%)	4.4		20.5
Experienced unemployment spell (%)	3.7		18.9
Borrower attorney in-sample experience (%)	85.7		35.0
Previous bankruptcy experience (%)	24.9		43.2
<i>Income and finance</i>			
Household monthly income (\$)	2,988	2,692	1,409
Total assets (\$)	135,356	114,901	96,479
Total liabilities (\$)	161,646	137,848	95,367
Total debt in default (\$)	43,777	30,867	52,619
Total unsecured debt (\$)	30,747	16,814	48,901
Medical debt/total debt in default > 0.10 (%)	7.6	26.5	0

Table 2. Data Summary: Homeownership Experience of Households in Bankruptcy

Variable	Mean	Median	S.D.
House tenure: losing houses to foreclosure (%)	27.9		45.4
Lender buy back (%)	18.7		39.0
Third party sale (%)	9.2		28.9
Bankruptcy filing to foreclosure sale (months)	27.7	24.8	13.4
Filers 3 months delinquent at filing	28.2	24.7	14.1
Filers 6 months delinquent at filing	27.3	24.7	13.5
Filers 1 year delinquent at filing	26.4	24.8	12.4
Bankruptcy termination to foreclosure sale (months)	13.2	11.9	14.5
Filers 3 months delinquent at filing	13.6	12.2	13.1
Filers 6 months delinquent at filing	13.4	11.9	12.7
Filers 1 year delinquent at filing	13.1	11.0	13.7
Foreclosure sale before the termination of bankruptcy (%)	14.1		34.8
Foreclosure sale price (\$, 2001 price)	97,241	90,256	53,707
Lender buy back (subsequently sold to third party)	99,165	87,171	55,248
Third party sale	93,732	96,277	51,123
Sale price/estimated market value at filing	1.14	1.09	0.51
Sale price/estimated market value at filing (adj. for inf., growth)	0.91	0.89	0.40
Sale price/(mortgage+arrear) at filing (adj. for inf.)	0.88	0.88	0.44
Sale price/(mortgage+arrear) at filing (adj. for inf., growth, trans. cost)	0.71	0.71	0.31



Table 3. Estimation Result: The Foreclosure Outcome

Variable	Estimate	S.D.	Marginal Effect
Months of mortgage delinquency	0.039*	0.008	0.012
Mortgage loan to value ratio	0.906*	0.314	0.285
House tenure	-0.015	0.010	-0.005
Already in foreclosure at filing	-0.076	0.145	-0.024
Tax lien foreclosure	0.675**	0.361	0.248
Subprime mortgage lender	0.120	0.180	0.039
Local lender	-0.094	0.226	-0.029
Lender being loan servicer	0.206	0.293	0.069
Lender attorney experience	-0.397*	0.189	-0.136
Previous bankruptcy experience	-0.260	0.160	-0.079
Filer attorney experience	-0.581*	0.170	-0.204
Job tenure	-0.001	0.009	0.000
Married	-0.299*	0.149	-0.092
Number of dependents	0.033	0.049	0.040
Recently divorced	0.125	0.168	0.040
Experienced unemployment spell	0.647*	0.322	0.236
Monthly mortgage payment/income	0.831*	0.379	0.261
Medical debt/total debt in default>10 percent	0.141	0.234	0.046
Debt in default/monthly income	0.004	0.003	0.001
Asset/total debt	0.163	0.307	0.051
Local homeownership rate (%)	0.009	0.017	0.003
Local labor force participation rate (%)	-0.026	0.022	-0.008
Income/local median household income	0.016	0.268	0.005
Local households living below poverty line (%)	-0.014	0.036	-0.005
Estimated house value/local median home value	-0.108	0.170	-0.034
Local median housing cost/local median home value	311*	124	98
Local average household size	0.725	0.832	0.228

Number of observations: 567; Pseudo R-squared: 0.170.

Notes: 1.\* indicates significance at the 5 percent level.

2. \*\* indicates significance at the 10 percent level.

3. For dummy variables, marginal effects are calculated for discrete change from 0 to 1.

Table 4. Estimation Result: Time to Sale  
(filing date to foreclosure sale date in months)

Variable	With Adj		Without Adj	
	Estimate	S.D.	Estimate	S.D.
Months of mortgage delinquency	-0.199**	0.110	-0.237*	0.110
Subprime mortgage lender	3.647	3.238	3.616	3.394
Local lender	3.514	4.208	3.925	4.353
Lender being loan servicer	-4.776	4.821	-5.196	4.995
Tax lien foreclosure	10.372*	4.701	9.774*	4.796
Filer attorney experience	5.815*	3.010	6.661*	2.803
Lender attorney experience	0.296	2.941	0.858	2.912
Local homeownership rate (%)	0.043	0.299	0.032	0.312
Local labor force participation rate (%)	-0.253	0.396	-0.221	0.411
Income/local median household income	-0.681	3.582	0.113	3.479
Local households living below poverty line (%)	-0.207	0.601	-0.196	0.629
Estimated house value/median home value	-3.237	2.493	-3.224	2.614
Local median housing cost/median home value	3328	2088	2806	1981
Local average household size	14.727	15.162	13.767	15.807
Mills ratio	2.451	4.125		

Observations: 567;

$\chi$ -squared: 101.89.

Notes: 1.\* indicates significance at the 5 percent level.

2. \*\* indicates significance at the 10 percent level.

Observations: 158;

Adj. R-squared: 0.117.

Table 5. Estimation Result: Time to Sale  
 (bankruptcy termination date to foreclosure sale date in months)

Variable	With Adj		Without Adj	
	Estimate	S.D.	Estimate	S.D.
Months of mortgage delinquency	-0.05	0.149	0.007	0.130
Subprime mortgage lender	-1.072	3.793	-1.004	3.974
Local lender	5.107	4.920	4.570	5.094
Lender being loan servicer	-11.992*	5.652	-11.387*	5.843
Tax lien foreclosure	8.920**	5.201	9.729**	5.609
Filer attorney experience	4.346	3.582	3.163	3.285
Lender attorney experience	1.585	3.459	0.795	3.408
Local homeownership rate (%)	0.090	0.352	0.100	0.369
Local labor force participation rate (%)	0.012	0.469	-0.037	0.486
Income/local median household income	0.627	4.168	-0.378	4.082
Local households living below poverty line (%)	-0.149	0.710	-0.170	0.743
Estimated house value/median home value	-4.759**	2.810	-4.997**	3.010
Local median housing cost/median home value	3911	2429	4585	2324
Local average household size	22.058	17.845	23.427	18.592
Mills ratio	-3.318	4.826		

Observations: 567;

$\chi$ -squared: 90.41.

Notes: 1.\* indicates significance at the 5 percent level.

2. \*\* indicates significance at the 10 percent level.

Observations: 158;

Adj. R-squared: 0.068.

Table 6. Estimation Result: Foreclosure Sale Price  
(sale price/estimated property value at the time of bankruptcy, inf. and housing market adj.)

Variable	With Adj		Without Adj	
	Estimate	S.D.	Estimate	S.D.
Months of mortgage delinquency	-0.004	0.004	0.003	0.003
Subprime mortgage lender	-0.080	0.096	-0.074	0.094
Local lender	0.323*	0.130	0.255*	0.127
Lender being loan servicer	-0.067	0.151	-0.012	0.146
Tax lien foreclosure	-0.137	0.157	-0.035	0.140
Filer attorney experience	0.135	0.094	0.009	0.079
Lender attorney experience	0.218*	0.095	0.172**	0.088
Local homeownership rate (%)	-0.020*	0.011	-0.016	0.010
Local labor force participation rate (%)	-0.013	0.015	-0.008	0.013
Income/local median household income	0.004	0.108	0.016	0.092
Local households living below poverty line (%)	-0.043**	0.022	-0.035**	0.019
Estimated house value/median home value	-0.356*	0.084	-0.304*	0.072
Local median housing cost/median home value	-18.082	89.051	-21.895	76.205
Local average household size	22.058*	17.845	23.427*	18.592
Mills ratio	-0.354*	0.120		

Observations: 555;

$\chi$ -squared: 115.64.

Notes: 1.\* indicates significance at the 5 percent level.

2. \*\* indicates significance at the 10 percent level.

Observations: 145;

Adj. R-squared: 0.218.

Table 7. Estimation Result: Foreclosure Sale Price  
(sale price/mortgage balance due at the time of bankruptcy, inf. adj.)

Variable	With Adj		Without Adj	
	Estimate	S.D.	Estimate	S.D.
Months of mortgage delinquency	0.003	0.003	-0.001	0.002
Subprime mortgage lender	-0.035	0.074	-0.038	0.075
Local lender	0.131	0.101	0.173**	0.101
Lender being loan servicer	-0.042	0.116	-0.079	0.116
Tax lien foreclosure	0.073	0.122	0.008	0.115
Filer attorney experience	-0.063	0.071	0.017	0.063
Lender attorney experience	0.164*	0.073	0.173*	0.101
Local homeownership rate (%)	-0.005	0.008	-0.008	0.008
Local labor force participation rate (%)	-0.006	0.010	-0.004	0.010
Income/local median household income	-0.090	0.082	-0.027	0.077
Local households living below poverty line (%)	-0.026**	0.015	-0.025**	0.015
Estimated house value/median home value	-0.151*	0.057	-0.143*	0.057
Local median housing cost/median home value	79.853	65.039	16.553	60.833
Local average household size	0.715*	0.0361	0.673*	0.366
Mills ratio	0.223*	0.090		

Observations: 555;

$\chi$ -squared: 98.50.

Notes: 1.\* indicates significance at the 5 percent level.

2. \*\* indicates significance at the 10 percent level.

Observations: 145;

Adj. R-squared: 0.169.

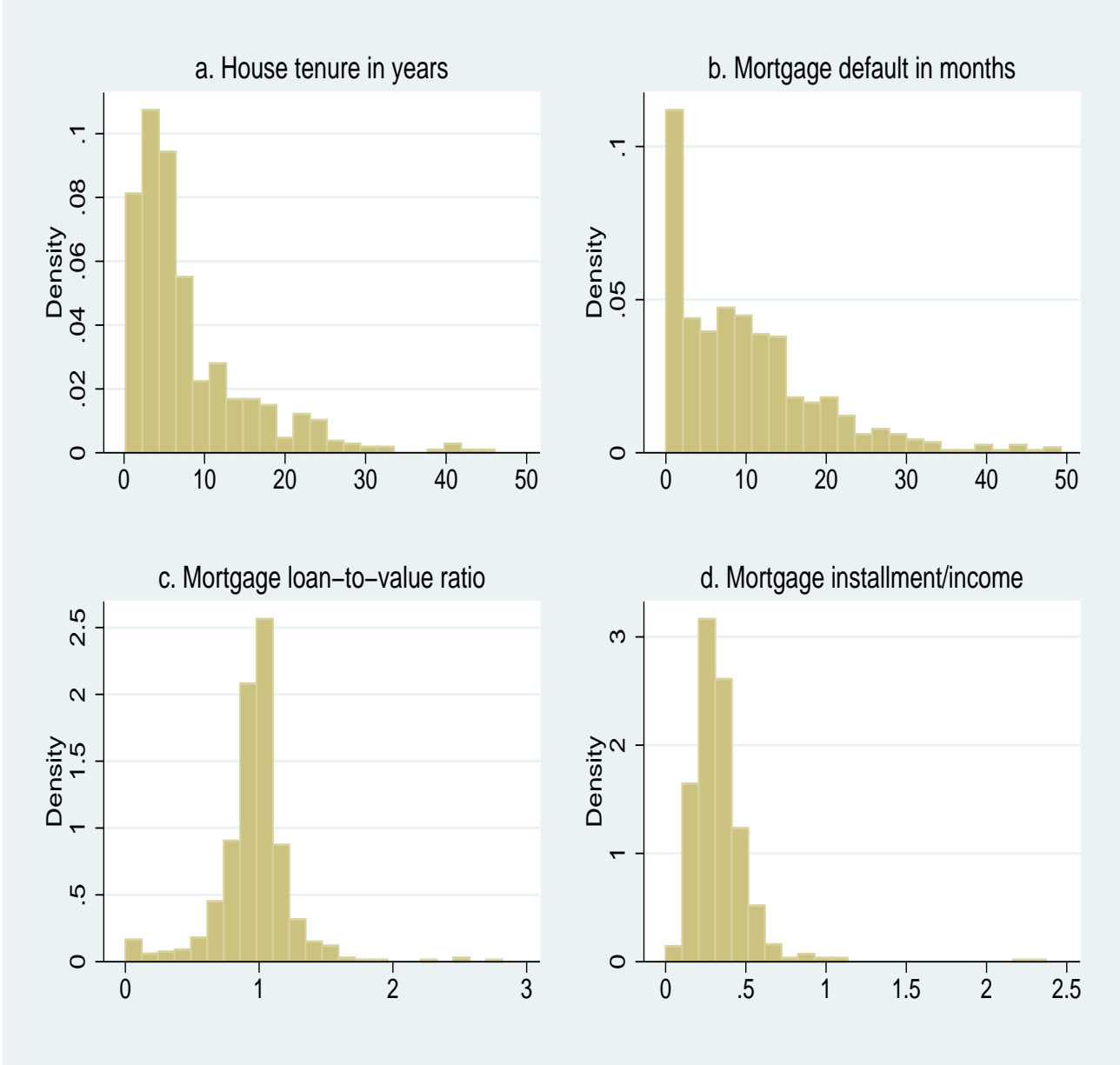


Figure 1. Housing Profiles of Bankruptcy Filers

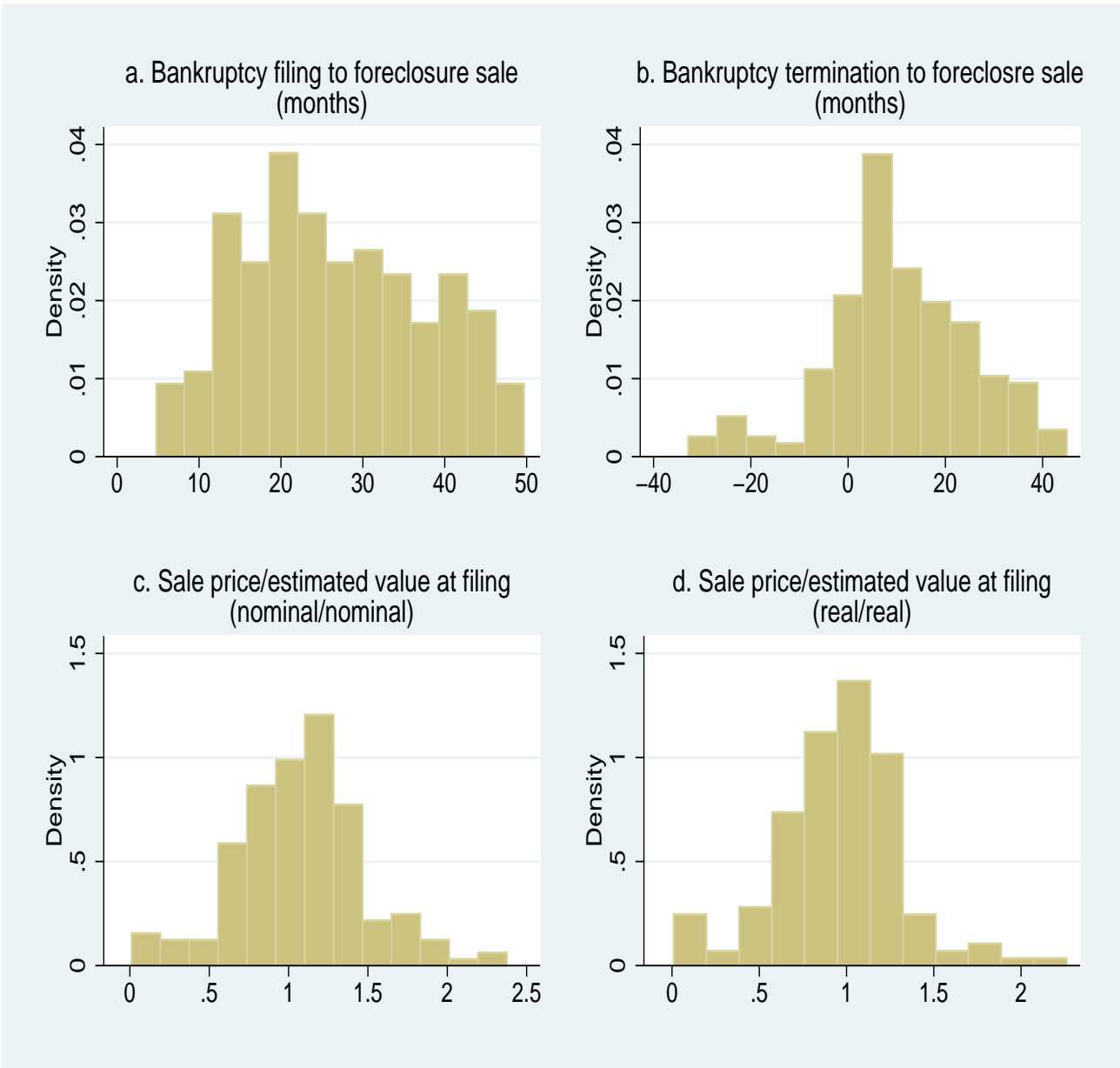


Figure 2. The Homeownership Experience of Bankruptcy Filers