

The Effect of Principal Reduction on Household Distress: Evidence from Mortgage Cramdown*

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March 2021

Abstract

Mortgage cramdown has been proposed as a mechanism to avoid mortgage foreclosures in times of crisis. In this restructuring, the underwater portion of the mortgage is treated as unsecured debt and can be discharged during Chapter 13 bankruptcy. To quantify the ex-post effects of bankruptcy discharge in cramdown courts, we use a new data set of district courts that allowed mortgage cramdown over the period from 1989 to 1993. We take advantage of the random assignment of cases assigned to judges who significantly vary in their leniency. We find that a successful bankruptcy filing in cramdown courts reduces the five-year foreclosure rate by 29 percentage points and decreases the number of moves post-bankruptcy. Although cramdown is beneficial for all demographic groups, we observe that cramdown particularly helps female filers, who are also less likely to receive a debt discharge during bankruptcy. Our results support that principal write-downs explain the vast majority of the reduction in foreclosure, and, thus, debt overhang considerations play an important role in explaining homeowners' default.

*We are grateful to Hengjie Ai, Peter Ganong, Borja Larrain, Gonzalo Maturana, Jose Tessada, and Tracy Wang and seminar participants at PUC-Chile, Universidad Adolfo Ibanez, the University of Minnesota, the University of Texas at Austin, and the Virtual Real Estate Seminar. In addition, we thank Tal Gross, Matthew Notowidigdo, and Jialan Wang for sharing their PACER dockets data and Joshua Goodman and Adam Levitin for sharing their data on the cramdown court rulings. Clemens Sialm is an independent contractor with AQR Capital Management. This research received generous financial support from the Alfred P. Sloan Foundation NBER Household Finance small grant program.

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1 Introduction

The United States experienced an unprecedented number of home foreclosures during the Great Recession of 2007–2009. To limit defaults and deadweight losses, the government implemented various policies that reduced monthly payments (i.e., Home Affordable Modification Program (HAMP)) and facilitated mortgage refinancing (i.e., Home Affordable Refinancing Program). However, various frictions in intermediation brought about only modest success for these initiatives.¹

An alternative policy proposal that was *not* implemented during the Great Recession would have allowed mortgage cramdown by judges as part of the Chapter 13 bankruptcy process. In these restructurings, the underwater portion of the mortgage is treated as unsecured debt and can be discharged during bankruptcy. Our paper investigates this alternative policy by estimating the effects of bankruptcy discharge on borrowers who benefit from mortgage cramdown.

Chapter 13 bankruptcy allows debtors to restructure almost all types of debt, except for loans on the principal place of residence.² However, some bankruptcy courts discharged the underwater portion of the mortgage during bankruptcy until the Supreme Court disallowed this practice in 1993. Although borrowers have to continue to make their monthly mortgage payments following the original terms of the loans, cramdown is beneficial for underwater borrowers because it reduces the debt owed on the property. Cramdown thereby decreases the incentives for households to default on their properties and decreases the likelihood that households will be forced to move out of their homes.

In this paper, we estimate the effect of mortgage cramdown on foreclosure and other economic outcomes. To this end, we estimate the causal effect of the bankruptcy

¹Agarwal et al. (2015) and Agarwal et al. (2017) show that securitization, which made renegotiations difficult, and servicers' organizational capacity hampered the impact of these policies.

²Other debts that cannot be discharged in bankruptcy are domestic support obligations, criminal penalties, penalties owed to government agencies, taxes, student loans, and fraudulent debts.

discharge using the judge's leniency as an instrumental variable for bankruptcy protection similar to [Dobbie and Song \(2015\)](#) and [Dobbie, Goldsmith-Pinkham, and Yang \(2017\)](#).³ As indicated by [Sullivan, Warren, and Westbrook \(1994\)](#), [Norberg and Compo \(2007\)](#), and [Chang and Schoar \(2013\)](#), the variation in leniency across judges is substantial. The main identifying assumptions are that judge assignments are associated with bankruptcy protection and that these assignments only impact debtor outcomes through the probabilities of receiving bankruptcy protection.

To estimate the impact of cramdown in Chapter 13 bankruptcy on debtor's home foreclosures and other economic outcomes, we compile a new data set. First, we collect information from the Public Access to Court Electronic Records (PACER) system, and we complement our data with bankruptcy information from [Gross, Notowidigdo, and Wang \(2014\)](#). Second, we match this data set with two other data sources to study debtors' mortgage defaults and other post-filing outcomes. Our sample contains bankruptcy records from 14,517 cases: 6,100 in cramdown courts and 8,417 in non-cramdown courts. This data set comprises individual filer information, such as the debtor's name, address, and last four digits of their social security number; case information, such as the chapter filed, filing date, court, office, outcome (i.e., discharged or dismissed), and judge and trustee names; and the debtor's outcome, such as foreclosure, sales, post-filing addresses, real property purchases, and mortality. To obtain information about the courts that allowed cramdown, we merge our data set with data collected by [Goodman and Levitin \(2014\)](#).

Our main result shows that a bankruptcy discharge in Chapter 13 in a cramdown court has a very large impact on future mortgage distress. We find that a discharge in a cramdown court reduces the five-year foreclosure rate by 29 percentage points

³A similar empirical strategy has been used to estimate the ex-post impact of the sentence length on earnings ([Kling, 2006](#)), foster care effects ([Doyle, 2007](#)), juvenile incarceration ([Aizer and Doyle Jr, 2015](#)), and corporate bankruptcy ([Chang and Schoar, 2013](#)), among other applications.

and involuntary sales (i.e., property sales for less than the mortgage amount) by 26 percentage points. We also find that discharge in cramdown courts stabilizes living arrangements and circumstances of households. For example, households are overall less likely to move, but when moving, they are more likely to move to neighborhoods with higher income levels.

We find beneficial effects of discharge in cramdown courts across different demographic groups. However, the benefits are substantially more pronounced for female filers. For example, involuntary sales decline by 41 percentage points for females and by only 22 percentage points for male filers. These economically large differences may occur because judges may require a higher threshold for female filers to qualify for Chapter 13 debt discharge. Indeed, the discharge rate for female filers is 4 to 5 percentage points lower than for male filers after controlling for other filer characteristics and court fixed effects. The differential treatment of female filers mostly by male judges may be due to systematic patterns of “in-group” tolerance, as discussed by [Egan, Matvos, and Seru \(2018\)](#) in the context of misconduct in the financial advisory industry.

Whether the beneficial discharge effects are driven by the cramdown provisions or by other features of debt restructuring through Chapter 13 is not clear. To address this question, we combine our samples from cramdown and non-cramdown courts and study whether the effects differ across the two samples. We find that the five-year foreclosure rate declines by 29 percentage points in cramdown courts and by only 5 percentage points in non-cramdown courts. Thus, our results indicate that the cramdown provision is the main driver of the beneficial effects of bankruptcy discharge in cramdown courts. Therefore, given the substantial costs of foreclosure, cramdown has significant benefits for homeowners ([Diamond, Gureny, and Tan \(2020\)](#)).

We also provide a partial-equilibrium back-of-the-envelope calculation of how many foreclosures could have been avoided had the United States allowed mortgage cram-

down during the 2008–2013 period. Our estimates indicate that more than half a million foreclosures could have been avoided with mortgage cramdown. This estimate supports the hypothesis that cramdown would have been an effective policy tool to reduce foreclosures.⁴

Our paper builds on an important literature in household finance that studies the impact of bankruptcy on foreclosures and other economic outcomes. Our paper is most related to [Dobbie and Song \(2015\)](#), who use random judge assignments to study the impact of unsecured debt relief from Chapter 13 protection on subsequent earnings, foreclosures, and mortality over the period from 1992 to 2009.⁵ They document significant economic benefits for households with successful bankruptcy filings. Our paper studies the benefits of principal reductions (secured debt relief) over the period from 1989 to 1993. We are the first to provide estimates of the ex-post impact of mortgage cramdown from Chapter 13 on mortgage default and other outcomes using a newly compiled data set. Whereas [Dobbie and Song \(2015\)](#) estimate a large effect of unsecured debt relief through Chapter 13 on avoiding foreclosure, we show that the effect of Chapter 13 in cramdown courts is six times larger relative to the standard Chapter 13 protection.

By estimating the ex-post effect of principal reduction, our paper also contributes to the literature on cramdown. [White and Zhu \(2010\)](#) examine how filing for bankruptcy helps financially distressed homeowners and present a model that evaluates the effects of introducing a cramdown provision after the 2005 bankruptcy reform. [Goodman and Levitin \(2014\)](#) analyze whether cramdown affects the cost of credit in the mortgage market, whereas [Li, Tewari, and White \(2014\)](#) estimate the effect of cramdown on the

⁴Luzzetti and Neumuller (2014), Agarwal et al. (2015), Agarwal et al. (2017), Abel and Fuster (2018), Ganong and Noel (2018), Piskorski and Seru (2018a), Piskorski and Seru (2018b), Gross et al. (2019), and Kaplan, Mitman, and Violante (2020) also study the impact of alternative policies on the financial crisis.

⁵This paper is also related to that of [Dobbie, Goldsmith-Pinkham, and Yang \(2017\)](#), who study the effect of Chapter 13 bankruptcy protection on financial health.

supply of mortgages. Interestingly, both papers find small effects on the supply side.

A growing literature studies the mechanism that explains household default and the effect of different debt-relief interventions. [Ganong and Noel \(2018\)](#) document that maturity extensions that increase liquidity have substantial benefits on debtors, while (small) principal reductions have no effect. [Dobbie and Song \(2020\)](#) find that interest write-downs provide positive benefits, whereas immediate payment reductions do not help debtors. [Ganong and Noel \(2020\)](#) find that negative equity exclusively causes a small fraction of defaults. We contribute to this literature by estimating the effect of large principal reductions on mortgage loans and documenting large effects, even in the short term, on debtors for this type of intervention. In addition, relative to other papers that study unsecured debt-relief interventions, our setting allows us to examine the mortgage debt overhang motive for defaulting.

The remainder of our paper is structured as follows: We discuss the institutional background and the differences between Chapters 7 and 13 bankruptcy in Section 2. Section 3 describes the data sources and summary statistics. Section 4 presents the research design. Section 5 presents our main results, and Section 6 compares outcomes of bankruptcy filings in cramdown with non-cramdown courts. Section 7 discusses our results and Section 8 concludes.

2 Institutional Background

The United States has two personal bankruptcy provisions: Chapter 7 and Chapter 13. Chapter 7 provides unsecured debt relief and protection from wage garnishment in exchange for a debtor's non-exempt assets. In contrast, Chapter 13 bankruptcy filers must forgo part of their future earnings to repay creditors. Chapter 13 debtors receive protection for their assets in exchange for partial repayment of debt. Therefore,

debtors seeking to retain their assets are more likely to file for Chapter 13. Overall, both bankruptcy provisions allow total or partial forgiveness of unsecured obligations, such as credit card debt, unpaid rent, and medical bills.

Based on the 1978 Bankruptcy code, which was amended in 1984, Chapter 13 debtors are required to use all their disposable income to propose a three-year repayment plan ([White, 1987](#)).⁶ The main restriction is that the total proposed repayment cannot be less than the value of a debtor's non-exempt assets under Chapter 7. Filers need to submit a bankruptcy petition, a repayment plan, a summary of financial affairs, a copy of tax returns, and the standardized forms of income, expenditures, and assets and liabilities. Subsequently, within each bankruptcy office, filers are typically assigned to judges using a blind rotation system. The debtor meets with a bankruptcy trustee who reviews the claims by creditors and debtors, challenges any aspects of the bankruptcy case if needed, and collects the bankruptcy proceeds during the repayment plan. Finally, the filer appears before the bankruptcy judge at the plan confirmation hearing. This is the only time in which the judge and the filer meet. The main role of the assigned judge is to decide all matters connected to a case, in particular, whether or not to dismiss the filing.

Chapter 13 allows debtors to restructure almost all types of debt, except home mortgage loans. In particular, Section 1322(b)(2) of the Bankruptcy Code provides that a Chapter 13 repayment plan may “modify the rights of holders of secured claims, *other than* a claim secured only by a security interest in real property that is the debtor’s principal residence” (11 U.S.C. sec. 1322[b][2]). Therefore, any mortgage arrears, late fees, and regular installments should be paid off according to their original terms; otherwise, the mortgagee has the right to foreclose on the property ([Goodman and Levitin, 2014](#)). The rationale behind restricting mortgage cramdown for principal

⁶After the 2005 Bankruptcy Reform, repayment plans last between three and five years.

residence is to encourage the flow of capital into the home lending market (Levitin, 2009).

Although mortgage modification is prohibited in Chapter 13 bankruptcy, some bankruptcy courts allowed principal mortgage reduction, a practice known as mortgage cramdown, between 1978 and June 1993.⁷ These rulings were not built on policy analysis; instead, they were based on statutory interpretations (Levitin, 2009). In particular, these courts understood cramdown as a simple reclassification of the loan in bankruptcy. The main argument was that the prohibitive clause (the “other than”) of §1322(b)(2) was limited to the value of the collateral, whereas any negative equity could be classified as unsecured debt and, thus, was dischargeable through bankruptcy.⁸

In practice, a Chapter 13 filer had to propose a repayment plan with the remaining secured claim. Under this plan, the filer had to pay the arrearages in full within a reasonable time and continue to make the monthly payments following the original terms of the loan until the principal had been paid in an amount equal to the value of the property. In courts that allowed cramdown, any negative equity portion of the mortgage was automatically forgiven if the Chapter 13 filing was discharged. In June 1993, the Supreme Court prohibited cramdown after ruling on the issue in *Nobelman v. American Savings Bank* (508 U.S. 324 [1993]), a decision that banned cramdown in

⁷There are 11 circuit courts in the United States, and each court covers two to nine states. Each state is divided into one to four bankruptcy court regions. A judge’s decision in a bankruptcy case might change law . However, any decision affects only the jurisdiction (district) in which the judge is presiding , a fact that generates differences in law across districts within a circuit court (Li, Tewari, and White (2014)).

⁸Mullaugh (1994) states that the courts that approved the cramdown under Chapter 13 plans based their decisions on four factors: “First, and perhaps most importantly, the courts felt that the plain language of the statutory provisions commanded the conclusion that bifurcation was permissible in the case of undersecured home mortgages. Second, the long-settled rules of statutory construction led to the same result as the plain language. Third, the legislative history, though sparse, evinced a Congressional intent to balance the interests of the debtor and the home mortgage lender through a compromise between the House and the Senate drafts of the relevant statutory provisions. Lastly, the policy underlying the bankruptcy framework, especially the policies underlying Chapter 13 reorganization, favored allowing the debtor to ‘strip down’ an undersecured home mortgage to better achieve the bankruptcy goal of a ‘fresh start’ for debtors.”

all states.

Prior to the Supreme Court decision on *Nobelman v. American Savings Bank* in 1993, four different circuit courts had allowed the practice of cramdown (i.e., the 2nd, 3rd, 9th, and 10th). However, the 5th circuit court did not approve the practice after hearing the *Nobelman* case (in August 1992). Prior to *Nobelman*, no circuit court had barred cramdown in Chapter 13, and several bankruptcy courts in other circuits had approved Chapter 13 reorganization plans that included cramdowns of undersecured home mortgages ([Mullaugh, 1994](#)). In particular, between 1981 and 1993, 38 courts in 29 states allowed mortgage principal reduction, and 32 of the rulings that led to cramdown occurred after 1988.

3 Data Sources and Summary Statistics

To estimate the impact of cramdown in Chapter 13 bankruptcy on debtors' home foreclosures and other outcomes, we assemble several data sets obtained from different sources.

3.1 Data Sources

We compile a new data set from the PACER system . We received fee exemptions to the docket records of 59 bankruptcy district courts in 36 states. In addition, we complement our data with bankruptcy data from [Gross, Notowidigdo, and Wang \(2014\)](#). Thus, our sample contains bankruptcy records from 84 (out of 94) courts. This data set contains individual filer information, such as the debtor's name, address, and last four digits of their social security number, and case information, such as the chapter filed, filing date, court, office, outcome (i.e., discharged or dismiss), and judge and trustee names.

To obtain information about the courts that allowed cramdown, we merge our data

set with data collected by [Goodman and Levitin \(2014\)](#). This data set comprises all judicial rulings on the permissibility of cramdown from federal bankruptcy, district, and circuit courts between October 1979 and June 1993.

Our final sample comprises Chapter 13 bankruptcy filers in those district courts in which bankruptcy cases are randomly assigned to judges and the Chapter 13 filers for whom we obtain real estate data. To this end, we follow [Dobbie and Song \(2015\)](#) and impose several data filters. First, we drop offices with a single Chapter 13 bankruptcy judge and exclude filings in courts that assign all cases to a single judge, since in these two situations, there is no randomization of the bankruptcy cases. Second, we exclude office-by-year bins in which a retiring judge's cases have been reassigned with no documentation about the original judge. Third, we drop office-by-year-by-judge bins with fewer than 10 cases. Fourth, we restrict our analysis of first-time filers to the period 1989 to 1993, the period in which most of the cramdown rulings occurred. Finally, we restrict our sample to Chapter 13 filers for which we matched to real estate data purchased from Attom using the address data and the last name provided in the bankruptcy dockets.

These filters leave us with 14,517 Chapter 13 filers in 31 offices, 25 bankruptcy courts, and 21 states. In particular, 6,100 cases in 18 offices in 12 states correspond to courts that allowed mortgage cramdown between 1989 and 1993. Panel A of Figure 1 depicts court locations by state, whereas Panel B shows the states in our sample in which cramdown was allowed. The final sample includes 213 office-year-judge observations. The number of cases in each office-year-judge bin ranges from 10 to 599, with an average of 195 cases.

[INSERT FIGURE 1 HERE]

For outcome variables, we rely on two proprietary sources. The first includes foreclosure data from Attom Data Solutions (former RealtyTrac), one of the leading foreclosure

listing data providers. Attom collects five types of filings from legal documents submitted by lenders during their foreclosure process. The first two filings, a notice of default (NOD) and a lis pendens (LIS), or written notice of a lawsuit, are submitted before a foreclosure auction. Two of the subsequent filings, a notice of a trustee sale (NTS) and a notice of a foreclosure sale (NFS), are directly associated with a foreclosure auction. Attom also collects information on whether the foreclosed home is purchased by the lender at auction or is real estate owned (REO). From the counties in which Attom has coverage starting in 1989, we successfully match 67% of the cases using only address data from the bankruptcy dockets, and 31% using the filer's address and last name. This approach ensures that the debtor was the effective owner at the time of the filing. Prior work has used Attom to obtain foreclosure data (e.g., [Mian, Sufi, and Trebbi \(2015\)](#); [Currie and Tekin \(2015\)](#)).

The second source of outcome and covariate variables is LexisNexis (LN) Public Records. LN aggregates data on over 500 million U.S. individuals, both alive and deceased, from a variety of sources, such as birth records, death records, property tax assessment records, criminal records, and voting records. LN provides a panel data set of records for U.S. individuals over time. Specifically, we obtain data about gender, age, history of addresses, real property records, etc. We successfully match 99% of filers using the names and social security numbers provided in the bankruptcy dockets.⁹

3.2 Summary Statistics

Table 1 presents descriptive statistics for all first-time Chapter 13 bankruptcy filers between 1989 and 1993, in Column 1, along with the statistics for the cramdown and non-cramdown samples in Columns 2–4 and 5–7, respectively. The average filer in our

⁹Prior work has used LexisNexis to obtain personal data on executives ([Cronqvist, Makhija, and Yonker \(2012\)](#); [Yermack \(2014\)](#)), fund managers ([Pool, Stoffman, and Yonker \(2012\)](#); [Chuprinin and Sosyura \(2018\)](#)), and financial journalists ([Ahern and Sosyura \(2015\)](#)).

sample is 42 years old at the time of filing. More than three-quarters of filers are male.

[INSERT TABLE 1 HERE]

Regarding filers' characteristics at the ZIP code level, the average filer in our sample lives in a neighborhood in which around 40% are white, 9% are single, 7% have college degrees, and the median income is close to \$23,000 (in 1980s dollars).

We have 14,517 cases in our total sample. Finally, the average discharge rate is around 66% for the full sample.

The household characteristics are fairly similar across the cramdown and non-cramdown samples, with the exception of gender. In the cramdown sample, 82% of filers are male, whereas 76% are male in the non-cramdown sample.

The discharge rate is lower in cramdown courts: whereas around 69% of filings are discharged in non-cramdown courts, 62% are discharged in cramdown courts. Thus, the probability of a successful Chapter 13 filing is lower in cramdown courts, where the benefits likely are higher because of the treatment of the underwater portion of a mortgage as unsecured debt.

4 Research Design

Following [Dobbie and Song \(2015\)](#), we estimate the effect of receiving Chapter 13 bankruptcy protection with a principal reduction. We exploit the fact that some U.S. bankruptcy courts use a blind rotation system to assign cases to judges within offices. Although there are standard principles, by which judges evaluate and dismiss bankruptcy cases, the variation in the interpretation of these principles across judges is substantial ([Sullivan, Warren, and Westbrook \(1994\)](#); [Norberg and Compo \(2007\)](#); [Chang and Schoar \(2013\)](#)).

Ordinary least squares (OLS) specifications of bankruptcy post-filing outcomes on whether the debtor receives Chapter 13 bankruptcy protection in courts that allowed cramdown is problematic for several reasons. For example, an omitted variable bias may occur because of unobserved characteristics that can also affect post-filing outcomes. To overcome such identification problems, our research design uses the random assignment of judges. In particular, we exploit the differences in judge discharge rates (leniency) as an instrument for receiving cramdown in Chapter 13, within courts that allowed principal mortgage reduction, through a two-stage least squares approach.

Following the literature, we estimate judge styles every year by omitting the own observations to address the own-observation bias problem.¹⁰ We define the judge's leniency of filing i as the leave-one-out fraction of filings granted by judge j in year t in court c and year t :

$$Leniency_{icjt} = \frac{1}{n_{cjt} - 1} \left(\sum_{k=1}^{n_{cjt}} D_k - D_i \right) - \frac{1}{n_{ct} - 1} \left(\sum_{k=1}^{n_{ct}} D_k - D_i \right), \quad (1)$$

where D_i is an indicator variable for discharge, n_{ct} is the number of cases in court c in year t , and n_{cjt} is the number of cases by judge j in year t . We estimate the judge's leniency for each year during the period from 1989 to 1993.

Subsequently, we estimate the causal effect of discharge in Chapter 13 bankruptcy through a two-stage least squares regression using the judge's leniency as an instrumental variable for bankruptcy protection. Specifically, we focus this analysis only on offices that allowed cramdown. Therefore, the second-stage estimating equation is

$$y_i = \alpha_{ot} + \beta \widehat{D}_i + \gamma' X_i + \varepsilon_i, \quad (2)$$

¹⁰See, for example, Kling (2006); Doyle (2007); David and Houseman (2010); Chang and Schoar (2013); Dahl, Kostøl, and Mogstad (2014); French and Song (2014); Aizer and Doyle Jr (2015); Maestas, Mullen, and Strand (2013); Dobbie and Song (2015); Dobbie, Goldsmith-Pinkham, and Yang (2017), and Cheng, Severino, and Townsend (2019).

where y is consumer i 's outcome in the period of interest (e.g., foreclosure one year after filing), D is an indicator of whether the Chapter 13 case was discharged, α_{ot} are the office-by-month-of-filing fixed effects, and X is a vector of pre-treatment covariates. β is the local average treatment effect (LATE) of receiving discharge in Chapter 13 for filers whose outcomes are altered by judge assignment (Imbens and Angrist, 1994). The first-stage estimating equation is

$$D_i = \alpha_{ot} + \delta \text{Leniency}_{icjt} + \gamma' X_i + \varepsilon_i, \quad (3)$$

where *Leniency* is the systematic component of judge behavior. To account for any serial correlation across filers at the level of randomization in both the first and second stages, we cluster standard errors at the office-by-judge level.

The three main identifying assumptions are (a) judge assignments are associated with bankruptcy protection, (b) judge assignments only impact debtor outcomes through the probabilities of receiving bankruptcy protection, and (c) the monotonicity assumption.

The exclusion restriction implies that the judge's leniency is unrelated to unobservable determinants of future outcomes. To partially test for this assumption, we estimate in Table 2 whether any pre-treatment individual- and local-level characteristics, such as age, gender, education, and income, can explain judge leniency. We control for office-by-month-of-filing fixed effects and cluster standard errors at the office-judge level. None of our covariates is significantly related to leniency, and a joint F -test has a p -value of 0.3108.¹¹ We discuss the relevance of judge assignments in more detail in Section 5.1.

¹¹In Section 5.2, we also show that adding controls to the regressions do not lead to significant changes in our estimates, consistent with the hypothesis that cases are randomly assigned to judges (Dahl et al., 2014).

[INSERT TABLE 2 HERE]

The exclusion restriction might be violated if the judge's leniency affects debtor outcomes through variables other than bankruptcy protection. For example, if more lenient judges are also more likely to provide financial counseling to debtors, which might also affect an individual's outcome. Since judges typically only interact with debtors at the confirmation hearing, it seems unlikely that judges would influence debtors other than through their ruling on the bankruptcy filing.

Finally, to identify a local average treatment effect, we must assume monotonicity. In our setting, the monotonicity assumption is that the probability of debt being discharged in Chapter 13 does not decrease when assigned to a relatively more lenient judge.¹² A partial test of the monotonicity assumption is that the first-stage estimates should be non-negative for different subsamples (Dahl et al., 2014). Section 6.2 provides evidence of a positive first stage based on filer characteristics.

The local average treatment effect β in Equation (2) captures the total impact of Chapter 13 discharge on debtor's future outcomes. Thus, it includes the direct effects of cramdown as well as the indirect effect of the other debt discharge. We compare in Section 6 the outcomes between cramdown and non-cramdown courts to shed light on the importance of cramdown relative to other features of the bankruptcy discharge.

5 Effect of Discharge on Cramdown Courts

Households that desire to keep their homes typically prefer to file for Chapter 13 instead of Chapter 7 bankruptcy. This preference is further strengthened if courts allow the discharge of the underwater portion of the mortgage through cramdowns. We discuss in this section the total effects of bankruptcy discharges in cramdown courts.

¹²Without the monotonicity assumption, the IV estimator will deliver a weighted average of the marginal treatment effects (Angrist et al., 1996).

Mortgage cramdown is beneficial for homeowners because it reduces the debt burden if their mortgage debt exceeds the fair value of the home. However, homeowners will still need to make their regular mortgage payments to avoid foreclosure. Furthermore, refinancing a mortgage is typically not possible immediately after filing for Chapter 13 bankruptcy due to the deterioration of the credit score and because of a lack of sufficient home equity.

5.1 First Stage

Figure 2 illustrates the relevance of the judge's leniency for bankruptcy discharges, aggregated at the judge-year level. The figure shows the relation between the residualized bankruptcy discharge rate (i.e., ε_i from Equation (3) averaged for each judge-year level) against the leave-one-out measure of the judge's leniency (i.e., $Leniency_{icjt}$ from Equation (1) averaged for each judge-year level). The regression in Equation (3) includes office-by-month fixed effects. By purging month and office effects, this procedure isolates the variation among judges in the same office at the same time. Panel A depicts the first-stage relation without demographic controls, and Panel B shows the relation with controls for age; gender; the percentages of white, single, and college-educated inhabitants; and the ZIP-code-level logarithm of the median income. We observe a strongly positive relation between the judge's leniency and residualized bankruptcy discharge both before and after, including control variables.

[INSERT FIGURE 2 HERE]

Interestingly, Figure 2 shows that the judge's leniency has a very broad range from -0.3 to 0.6. Thus, the discharge rate for the most lenient judges is 60 percentage points higher than that for the other judges in the same office at the same time, and the discharge rate for the strictest judges is 30 percentage points lower than their peer

judges. This substantial range in lenience demonstrates important differences in the interpretation of the standard principles of bankruptcy across judges. We also find significant persistence in judge leniency. Figure 3 depicts current and lagged judge discharge rates, with each point representing a separate judge by year observation.

[INSERT FIGURE 3 HERE]

Table 3 presents the linear-probability relation between bankruptcy discharge and the judge's leniency using disaggregated individual-level data. Column 1 presents the estimates without any controls besides office-by-month fixed effects. The standard errors are clustered at the office-by-judge level.

We find that a one-percentage-point increase in the judge's leniency in other filings increases the probability that a debtor receives Chapter 13 protection by 0.894 percentage point. The estimates are similar when we include controls at the individual level (column 2) and at the ZIP code level (column 3). The leave-one-out measure of leniency, filer characteristics, and office-by-month fixed effects explains only around 22% of the variation in discharge rates. Thus, a substantial proportion of the variation cannot be explained by observable variables.

[INSERT TABLE 3 HERE]

Interestingly, Chapter 13 filings by female debtors are less likely to be discharged than the ones by male debtors. Furthermore, filings by debtors living in ZIP codes with a larger fraction of white inhabitants are more likely to be successful. These differences could be due to unobserved characteristics that are correlated with these filer characteristics or also due to discrimination. Judges, who are mostly white males, may impose higher qualification thresholds on individuals who represent minority groups in bankruptcy filings.

Altogether, Figure 2 and Table 3 confirm that the judge’s leniency is highly predictive of receiving bankruptcy protection. Thus, the judge’s leniency satisfies the relevance criterion.

5.2 Foreclosure Rates

To study whether a Chapter 13 discharge in cramdown courts reduces future foreclosures, we run the two-stage least squares specification summarized in Equations (2) and (3). Table 4 reports the estimates of the impact of Chapter 13 bankruptcy protection in courts that allowed mortgage cramdown on homeowners’ distress events.

We use two different distress events: foreclosures (Panel A) and involuntary sales (Panel B). Home foreclosure is an indicator for a filer’s home receiving a notice of default, transfer or sale or having been transferred to a real estate owned after the bankruptcy filing. Involuntary sales capture cases in which a homeowner is selling her property for less than the amount due on the mortgage after the bankruptcy filing. The controls include age; gender; the percentage of the ZIP code’s population that is white, single, and college educated; and the median log income in the ZIP code. All regressions include office-by-month-of-filing fixed effects, and the standard errors are clustered at the office-by-judge level.¹³

[INSERT TABLE 4 HERE]

Panel A of Table 4 reports that the discharge reduces foreclosures by 26 percentage points after three years and by 29 percentage points after five years. The results are highly statistically and economically significant. The estimates are very similar if we include additional demographic control variables.

¹³In panel A of Figure IA.1 in the Internet Appendix, we find similar results if we use a distress measure that includes additional events, such as real-estate-owned (REO) liquidation, besides the foreclosure events.

Panel A of Figure 4 depicts the yearly changes in home foreclosure after mortgage discharge in cramdown courts. The economic magnitude of the discharge effect is relatively small in the first year, but substantially grows over the next two years. The discharge effect stabilizes after four years.

[INSERT FIGURE 4 HERE]

Panel B of Table 4 and Figure 4 report similar effects for the alternative measure of distress. For example, bankruptcy discharge decreases the probability of an involuntary sale over the first five years by 26 percentage points.

5.3 Additional Benefits

The debt relief provided by successful Chapter 13 filings in cramdown courts may have additional benefits for debtors. Mortgage discharge can stabilize the living arrangements and circumstances of households. For example, households benefiting from discharge may avoid having to move to a new home. Moving can be especially costly for families with school-aged children, so sidestepping a move would be beneficial. Furthermore, these households may have the flexibility to move to better neighborhoods or purchase new properties. Finally, the stress of a foreclosure or the resultant moves may worsen the mortality rate for households.

Table 5 reports the effects of discharge in cramdown courts on these other outcomes. The empirical specification is again the two-stage least squares summarized in Equations (2) and (3), where we use alternative outcome variables.

[INSERT TABLE 5 HERE]

We find that households with discharged debt are significantly less likely to move to new addresses over the five years after filing. For example, the propensity to move to a

new address declines by around 20 percentage points for discharged debtors. Households are also less likely to voluntarily sell their home, which excludes short sells.

Furthermore, we find that discharged debtors are more likely to move to a better ZIP code, which occurs when a higher median income level on the filer's first move after filing for bankruptcy. This result indicates that bankruptcy discharge with cramdown increases the household's flexibility to enhance their living arrangements.

Finally, we do not find that Chapter 13 discharge through cramdown significantly affects the probability of households to purchase new properties. We also do not find a significant impact on mortality, given that most filers are relatively young.

5.4 Filer Characteristics

The benefit of mortgage discharge in cramdown courts may differ by households with different characteristics. Foreclosures may be more disrupting for younger debtors with school-aged children. Similarly, foreclosures may be more costly for individuals living in single-family homes, since they may have customized their homes according to their own preferences. Finally, gender may matter because judges may treat female filers differently than male filers, as documented in Table 3. Furthermore, female filers may be more reluctant to be forced to move, as they are more likely to take care of children.

Table 6 shows that the results are broadly consistent across different demographic groups. Filers below 50 years old exhibit larger declines in the three-year foreclosure rate, although the differences are not statistically significant. Similarly, filers owning single-family homes also exhibit larger declines in foreclosure rates than owners in multi-family units (e.g., condominiums). Because of the limited sample size, these differences are also not statistically significant.

[INSERT TABLE 6 HERE]

The only statistically significant difference occurs for gender differences using the involuntary sale measure reported in Panel B. Involuntary sales decline by 41 percentage points for female filers and by only 22 percentage points for male filers. These economically large differences may occur because female filers may have a stronger preference to remain in their homes or because of discrimination, as judges may require a higher threshold to qualify for Chapter 13 debt discharge for female filers, as shown in Table 3. The differential treatment of female filers mostly by male judges may be due to systematic patterns of “in-group” tolerance, as discussed by Egan, Matvos, and Seru (2018) in the context of misconduct in the financial advisory industry.¹⁴

6 Differential Effects between Cramdown and Non-Cramdown Courts

Our previous results show that debt discharge in cramdown courts has a large impact on the economic circumstances of households. However, whether these effects are driven by the cramdown provisions or by other features of debt restructuring through Chapter 13 is unclear. To address this question, we combine our samples from cramdown and non-cramdown courts and study whether the effects differ across the two samples.

6.1 Differential Foreclosure Effects

Figure 5 compares the impact of debt discharge on the two distress proxies between cramdown and non-cramdown courts.¹⁵ Debt discharge is substantially more beneficial in cramdown courts because of the reduction of debt for underwater homeowners.

¹⁴We also study the heterogeneity of the effect of Chapter 13 in cramdown courts on foreclosure in recession periods relative to normal periods. Table IA.1 shows that the difference is not statistically significant.

¹⁵Panel B of Figure IA.1 presents the results for any distress event.

Table 7 confirms that the impact of debt discharge is substantially more pronounced in cramdown courts. For example, the three-year foreclosure rate declines by around 27 percentage points for cramdown courts and by only four percentage points for non-cramdown courts. The difference in the two coefficients is highly statistically significant, as indicated by the small *p*-values. These results support that most of the discharge effect is due to the principal reduction.

[INSERT FIGURE 5 HERE]

One potential issue of these results is that the propensity to file for Chapter 13 may differ across cramdown courts and non-cramdown courts. For example, more households may file for Chapter 13 bankruptcy in cramdown courts because of the potential discharge of the underwater portion of the mortgage. These additional filers therefore may be less distressed. Furthermore, trustees and judges in cramdown courts may follow different debt restructuring strategies. Judges may be more likely to approve a restructuring plan in cramdown courts since these plans are more likely to succeed if a write-down of mortgage debt is possible. However, Table 1 shows that judges discharge a smaller proportion of debt in cases in cramdown courts than in those in non-cramdown courts.

[INSERT TABLE 7 HERE]

6.2 Compliers versus Non-Compliers

Our IV estimates should be interpreted as the local average treatment effects of filers receiving Chapter 13 protection in cramdown courts whose outcomes are altered by judge assignments (Imbens and Angrist, 1994). Learning about the characteristics of the complier group is of interest. In addition, examining the covariates of the compliers

allows us to compare the characteristics of the marginal filers of Chapter 13 in cramdown and non-cramdown courts during our sample period.

Table 8 presents characteristics of compliers, following Angrist and Pischke (2008). Panel A reports the distributions of filers in cramdown courts. Column 1 presents the proportion of the sample within each gender and age group (i.e., $P(X = x)$). For example, 43.3% of filers in cramdown courts are men between 35 and 50 years of age, whereas 9.2% of filers are women between 35 and 50 years. Column 2 shows the first-stage estimates for each gender and age group, corresponding to Table 3. These positive first-stage estimates for different subgroups are consistent with the monotonicity assumption. In addition, the judge's leniency in cramdown courts is less predictive of discharge for female filers between the ages of 35 and 50 than for any other demographic group. Column 3 reports the distribution of compliers by gender and age (i.e., $P(X = x|I_1 > I_0)$), calculated as the first-stage estimate for the gender-age groups times the sample share, divided by the overall first-stage estimate. Although 9.2% of filers are women between the ages of 35 and 50, only 6.6% of compliers are women in this age group. The last column, which is defined as the ratio between the relative likelihood of a filer belonging to a particular gender and age group in the complier group compared with the relative likelihood in the sample, confirms that women between 35 and 50 years are underrepresented in the sample of compliers in cramdown courts.

[INSERT TABLE 8 HERE]

Panel B reports the results for filers in non-cramdown courts. The estimates show that males are somewhat overrepresented in the complier group, as in the cramdown courts. However, the most important difference relative to the compliers in the cramdown courts is the composition of female filers. Women aged 35–50 are equally represented in the complier group, while women older than 50 are unrepresented in the complier group.

7 Discussion

In this section, we discuss whether the effects are driven by the relaxation of liquidity constraints or by the reduction of strategic default motivations because of a decrease in debt overhang. We also provide a back-of-the-envelope calculation of how many foreclosures could have been avoided during the Great Recession if bankruptcy courts would have been allowed to cramdown underwater mortgage debt.

7.1 Mechanisms

In the previous sections, we documented substantial benefits for homeowners of successful Chapter 13 filings in cramdown courts. In addition, the comparison of the ex-post effects of successful filers in courts with and without cramdown provides evidence that the principal reduction through personal bankruptcy offers substantial benefits for homeowners.

Two potential explanations for the large economic magnitude of the effects merit discussion. The first, which we call the liquidity hypothesis, is that the reduction in short-term payments helps debtors by alleviating liquidity constraints. The second is that the reduction in long-term obligations helps debtors by reducing their debt relative to the value of their house. We call this second explanation “the debt overhang hypothesis” ([Ganong and Noel, 2018](#); [Dobbie and Song, 2020](#); [Ganong and Noel, 2020](#)).

Two features in the setting shed light on the mechanism. First, in courts that allowed cramdown, the negative equity portion of the mortgage is classified as unsecured debt and thus is dischargeable. Second, in cramdown, the loan will not be modified. That means debtors must continue making monthly payments following the terms of the original loan until the principal payments total the present value of the collateral. Thus, cramdown primarily provides debt relief in the form of the second hypothesis,

and it seems that the debt overhang channel plays an important role in explaining our results.

There are two challenges to this interpretation. First, debtors could have also received some unsecured debt relief, in addition to the principal reduction in Chapter 13. However, if the unsecured debt was relatively more important to debtors in our sample, they should have filed for Chapter 7, which would be a more favorable option for discharging unsecured debt. In addition, the comparison of cramdown in Chapter 13 to standard Chapter 13 (as shown in Figure 5), in which we find that the impact of cramdown is six times larger on foreclosures, alleviates this concern.

The second challenge is that debtors could have received unsecured or secured credit following Chapter 13 bankruptcy. However, in the case of unsecured debt, after filing for Chapter 13, lenders can cancel the debtor's account. Also, the trustee may confiscate the filer's credit cards since the trustee must supervise the debtor's finances for three to five years (Elias, 2013). In addition, Dobbie, Goldsmith-Pinkham, and Yang (2017) do not find an effect on unsecured credit following Chapter 13. In the case of secured lending, it could have been that debtors refinanced their mortgages following cramdown. However, refinancing is typically not available in the first two years following Chapter 13, and it is difficult in practice . For example, the debtor typically needs to have a good credit score, which is unlikely after receiving a bankruptcy flag, and sufficient home equity to be approved for a mortgage. Furthermore, the filer requires judge approval. Thus, it seems unlikely that debtors receive substantial access to external financing at least during the first years following Chapter 13.

A caveat of our findings is that our setting does not allow us to study the role of liquidity constraints in foreclosure since we are estimating the impact of principal reductions. Consequently, our results do not reject the importance of liquidity constraints as a potential determinant for homeowners' default. However, our results suggest that

short-term liquidity cannot fully explain the documented ex-post effects of cramdown in Chapter 13. More importantly, we provide evidence that debt overhang considerations play an important role in explaining homeowners' default, contrary to the view that distress mainly comes from liquidity constraints.

Finally, one question that this discussion raises is why our estimates of the principal reduction in Chapter 13 are so large relative to the documented effect of principal reduction policies implemented during the Great Recession. One potential explanation is that the principal reduction programs employed during the financial crisis (e.g., HAMP) were relatively small, and, thus, homeowners were probably still underwater following these loan modifications. In contrast, homeowners in the cramdown courts had their total negative equity portion forgiven in Chapter 13 bankruptcy and therefore had greater incentives to avoid default.

7.2 Costs and Policy Benefits

The assessment of consumer bankruptcy laws typically involves the evaluation of two effects. The first effect is that bankruptcy provides partial insurance by helping households' smooth consumption when hit by a particularly adverse event (e.g., health shocks). The second effect is the greater borrowing costs due to a higher risk of default, which reduces households' ability to smooth expected changes in earnings (e.g., Athreya (2002); Li and Sarte (2006); Livshits et al. (2007); Chatterjee and Gordon (2012); Gross et al. (2019)).

Our paper focuses on the first effect of changes in the generosity of the personal bankruptcy code: the ex-post benefits of cramdown in Chapter 13. We document substantial ex-post effects for marginal filers on household distress. Filers are substantially more likely to keep their homes, and cramdown also stabilizes living arrangements. Given the high costs of foreclosure (Diamond et al., 2020), particularly for marginal

debtors who are most responsive to foreclosure mitigation policies and the negative spillovers of foreclosure, cramdown has significant ex-post benefits for homeowners.¹⁶

However, this policy may be costly for borrowers ex-ante or may hurt other market participants ex-post. In particular, the introduction of cramdown can lead to higher borrowing costs. Goodman and Levitin (2014) and Li, Tewari, and White (2014) find relatively small effects of cramdown on interest rates and other mortgage terms. The former finds that when cramdown was allowed, home loans had interest rates that were 16 basis points higher, and the latter finds that when the Supreme Court abolished mortgage cramdown, this led to a short-term reduction of 3% in mortgage interest rates and an increase of 1% in mortgage approval rates. Furthermore, Levitin (2009) argues that the market is unlikely to price against bankruptcy modifications since lenders face smaller losses from bankruptcy modifications than from foreclosures.

We also study whether the mortgage cramdown feature significantly increased Chapter 13 bankruptcy filings. To investigate this question, we study the number of Chapter 13 filings around the Supreme Court decision of June 1993 that prohibited mortgage cramdown in all states. Figure 6 shows no significant bunching in the bankruptcy filings in cramdown courts in June 1993. Furthermore, bankruptcy filings in cramdown courts did not significantly decrease after the Supreme Court decision, as Chapter 13 bankruptcy became less beneficial.

[INSERT FIGURE 6 HERE]

¹⁶Mian et al. (2015) and Guren and McQuade (2020) find that foreclosures have large market-level effects. While Immergluck and Smith (2006), Campbell et al. (2011), Harding et al. (2009), Anenberg and Kung (2014), Gerardi et al. (2015), Gupta (2019) provide evidence of localized foreclosure spillovers.

7.3 Cramdown Proposal during the Financial Crisis

The United States experienced an unprecedented number of home foreclosures during the Great Recession of 2007–2009. The government implemented various policies to reduce defaults and the deadweight losses of foreclosures (e.g., HAMP, Home Affordable Refinancing Program). However, [Agarwal et al. \(2015\)](#) and [Agarwal et al. \(2017\)](#) show that various frictions hampered the impact of these policies. One alternative proposal in 2008 was to allow mortgage cramdown by judges through Chapter 13 bankruptcy. The proposal passed the House of Representatives, but failed in the Senate. In this section, we provide a back-of-the-envelope calculation of the potential benefits that cramdown would have had during the financial crisis.

To estimate the number of foreclosures avoided, we extrapolate our estimates in a partial equilibrium approach. We make several assumptions: First, we assume similar effects across groups (i.e., compliers vs. non-compliers). Second, we assume that the effect of cramdown would have been the same during the Great Recession as during our sample period. Third, the number of total filers is the same with and without cramdown. Fourth and finally, we do not consider general equilibrium effects (e.g., credit supply, interest rate, home values).

We start with 7.6 million total filings of Chapters 7 and 13 bankruptcies between 2008 and 2013. The homeownership rate during this time period equaled 64%, resulting in around 4.9 million filings by homeowners, which would be expected to file for Chapter 13. During this time period 49% of Chapter 13 filings were discharged, resulting in 2.4 million successful bankruptcy filings. Table 7 documents that cramdown reduced five-year foreclosure rates by around 24 percentage points relative to non-cramdown. Using this estimate, we find a reduction of around 0.57 million foreclosures over the five years after the bankruptcy.

Our estimates potentially underestimate the effect of cramdown during the Great

Recession since the decline in house prices was greater during this time period. Furthermore, the proportion of households that filed for Chapter 13 bankruptcy may have increased with a more generous bankruptcy procedure. This analysis can also potentially overestimate the effect of cramdown since we identify the causal impact of cramdown for the compliers. However, our estimates for the compliers are relevant for policy since reforms aimed at introducing cramdown will likely have the largest effect on debtors on the margin of program participation.

8 Conclusions

We document that mortgage cramdown has significant ex-post benefits for bankruptcy filers. We find that a successful Chapter 13 filing reduced the five-year foreclosure rate by 29 percentage points and reduced the number of moves post-bankruptcy in cramdown courts over the period from 1989 to 1993. We also find that cramdown explains the vast majority of the reduction in foreclosure rates for Chapter 13 filers. Our results indicate that cramdown is an effective policy to reduce home foreclosures and enhance the living standards of bankruptcy filers.

Our estimates also shed light on the debate about the drivers of borrowers' default. Even if our setting does not allow us to fully rule out the effect of liquidity on default, some features of the setting help us to examine the mortgage debt overhang motive for defaulting. Altogether, our results suggest that short-term liquidity cannot fully explain the documented ex-post effects of cramdown in Chapter 13 and that debt overhang considerations play an important role in explaining homeowners' default, contrary to the view that distress is solely due to liquidity constraints.

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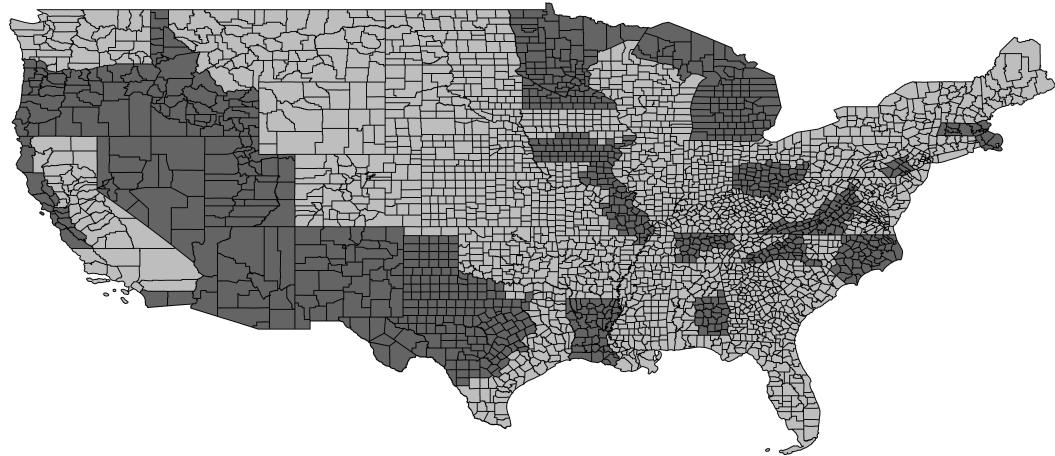
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Panel A. District Courts in Sample



Panel B. District Courts in Sample that Allowed Cramdown

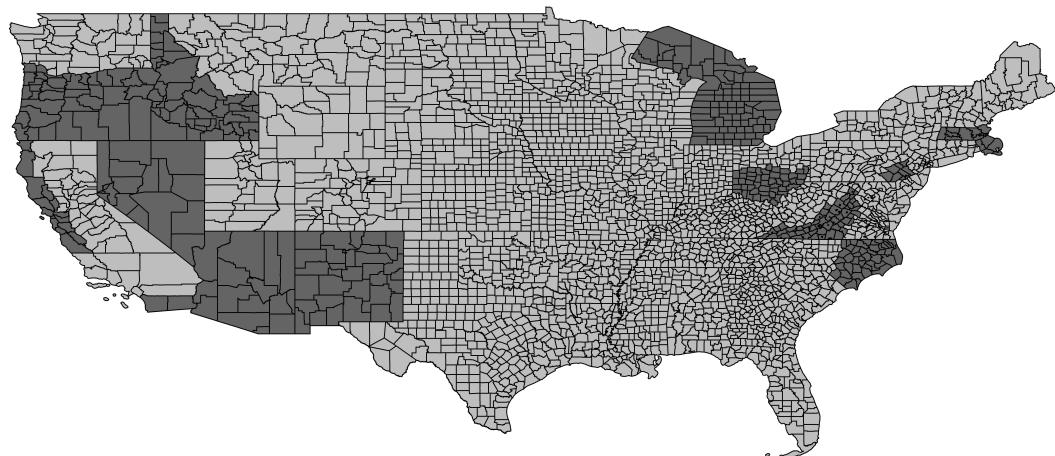
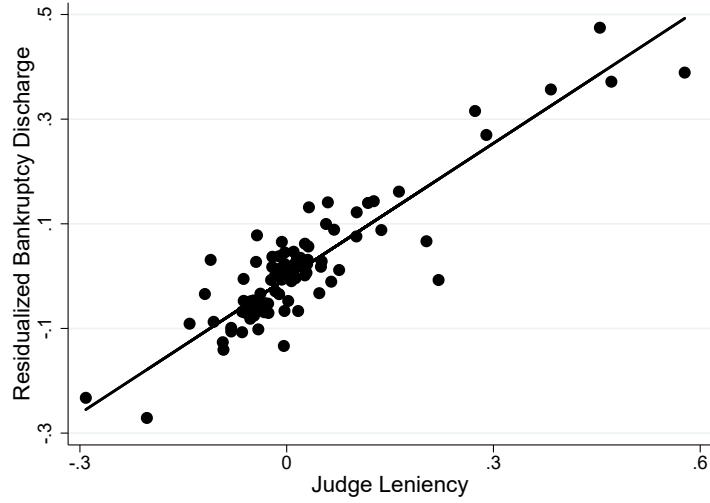


Figure 1. Bankruptcy district courts that allowed cramdown

These panels depict all courts in our sample and those courts that randomly assigned cases and allowed mortgage principal reduction. The dark gray shading in Panel A represents all the district courts in our sample, whereas in Panel B the dark gray shading represents the courts in our sample that allowed mortgage cramdown between 1989 and 1993.

Panel A. First stage without controls



Panel B. First stage with controls

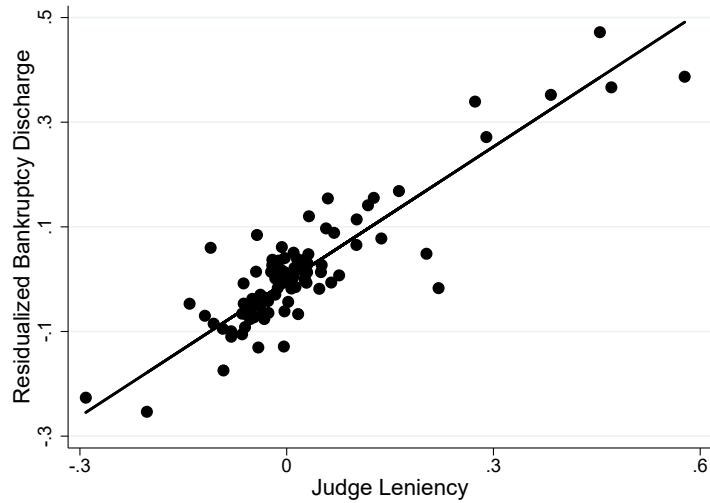


Figure 2. First stage: Relation between judge leniency and bankruptcy discharge
 These panels plot Chapter 13 discharge against the leave-one-out measure of judge leniency in cramdown courts. The sample consists of all first-time Chapter 13 filers between 1989 and 1993. To construct the binned scatterplot in Panel A, we regress an indicator variable for Chapter 13 discharge on office-by-month-of-filing fixed effects and calculate residuals. Subsequently, we calculate the mean residual in each judge-by-year bin. In Panel B, we follow the same procedure, but we include pre-treatment covariates at the filer and ZIP code levels.

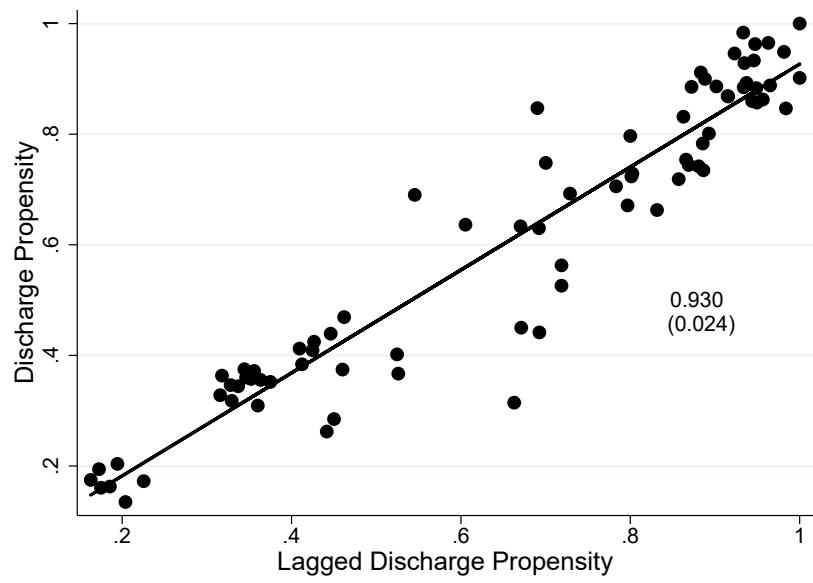
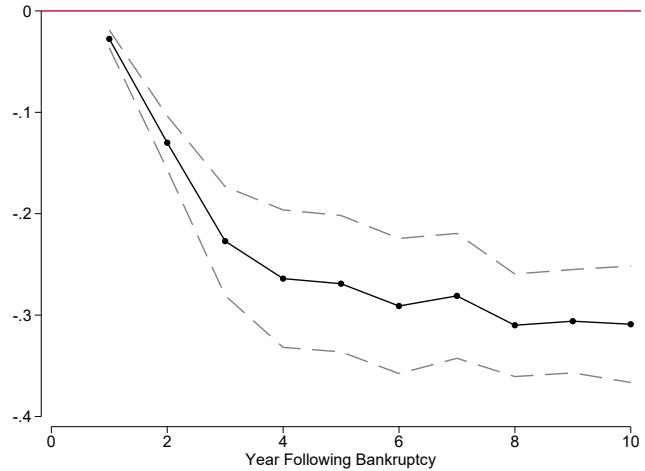


Figure 3. Persistence of Chapter 13 judge discharge rates

This figure shows the correlation between judge-specific Chapter 13 discharge rates in the current and lagged years. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the offices that randomly assigned filings to judges, which allowed for mortgage cramdown in this period.

Panel A. Home foreclosure



Panel B. Involuntary sale

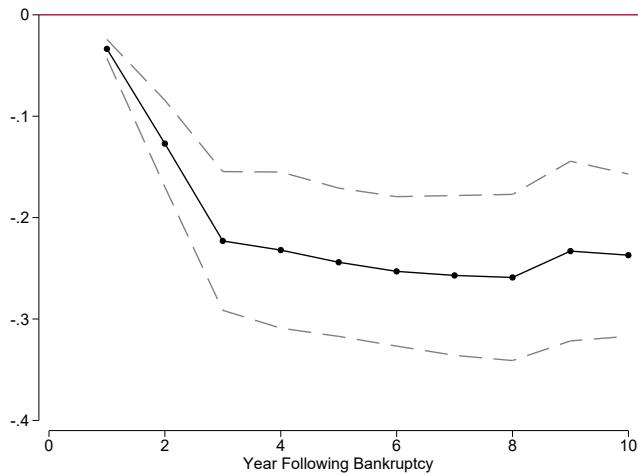
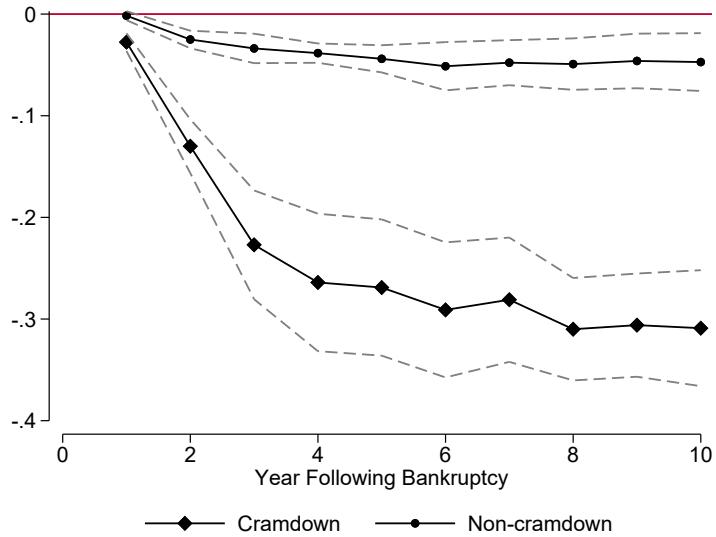


Figure 4. Home foreclosures and involuntary sales

These panels plot two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection in courts that allowed mortgage cramdown on home foreclosures and involuntary sales. Home foreclosure is an indicator for a filer's home receiving a notice of default, transfer or sale, or having been transferred to a real estate owned in or before the indicated year. Involuntary sale is an indicator for when a short home sale is registered in or before the indicated year. The dashed lines represent 95% confidence intervals from standard errors clustered at the office-by-judge level.

Panel A. Home foreclosure



Panel B. Involuntary sale

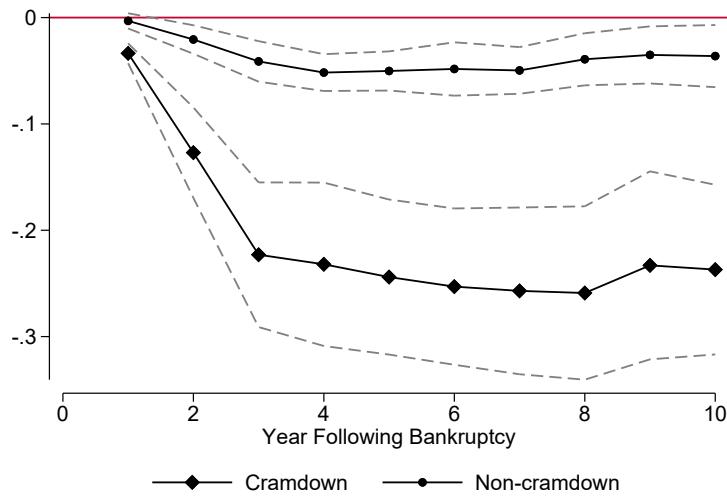


Figure 5. Cramdown versus non-cramdown courts

These panels plot the two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection on home foreclosures and involuntary sales in cramdown and non-cramdown courts. Home foreclosure is an indicator for a filer's home receiving a notice of default, transfer or sale, or having been transferred to a real estate owned in or before the indicated year. Involuntary sale is an indicator for when a short home sale is registered in or before the indicated year. The dashed lines represent 95% confidence intervals from standard errors clustered at the office-by-judge level.

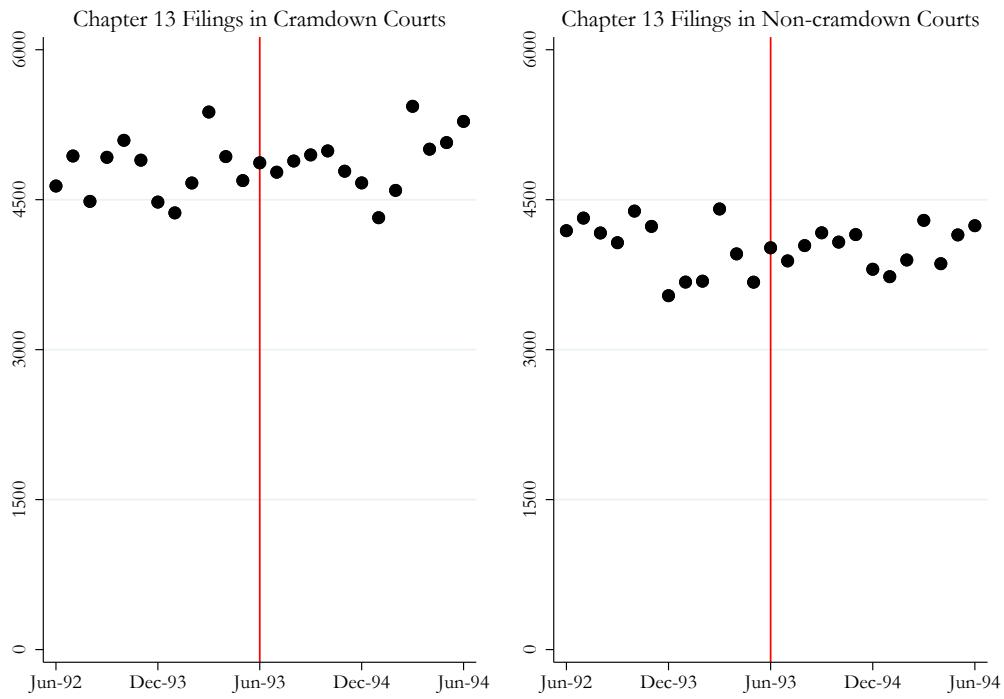


Figure 6. Time series of Chapter 13 bankruptcy filings around the Supreme Court decision in June 1993

The figure depicts the monthly number of Chapter 13 bankruptcy filings before and after the Supreme Court disallowed cramdown in June 1993. The sample consists of all Chapter 13 bankruptcy filings included in the PACER sample from June 1992 through June 1994. The sample includes 35 district courts in the cramdown group and 36 in the non-cramdown group. Each dot in the panels represents the total count of Chapter 13 filings for that month.

Table 1. Summary statistics

This table reports summary statistics for the sample consisting of first-time Chapter 13 filers between 1989 and 1993 in the offices that randomly assign filings to judges. The cramdown sample comprises the district courts that allowed the mortgage principal reduction in Chapter 13 between 1989 and 1993. The non-cramdown sample consists of those courts that prohibited mortgage cramdown during the same period. Age data come from the Lexis-Nexis (LN) Public records and correspond to the individual's age at the time of filing. Gender data are from LN. ZIP-code-level pre-treatment characteristics are from the 1980 Centennial Census. Discharge is an indicator for receiving Chapter 13 bankruptcy protection.

	Full sample		Cramdown		Non-cramdown		
	Mean (1)	Mean (2)	SD (3)	Median (4)	Mean (5)	SD (6)	Median (7)
Age	41.64	42.20	10.68	41	41.24	10.82	40
Male	78.40%	81.62%	38.73%	—	75.74%	42.87%	—
Percentage white (ZIP code)	40.10%	40.45%	33.69%	37.82%	39.83%	34.79%	33.88%
Percentage single (ZIP code)	9.28%	9.36%	8.81%	6.71%	9.22%	8.85%	7.78%
Percentage coll. degree (ZIP code)	7.40%	7.86%	8.93%	4.86%	7.06%	8.21%	4.86%
Median income (ZIP code)	22,740.94	23,174.47	20,674.57	20,952.90	22,420.73	20,097.79	21,072.44
Number of cases	14,517	6,100	—	—	8,417	—	—
Cases discharged	65.55%	61.54%	48.65%	-	68.55%	46.43%	-

Table 2. Randomization test

This table presents reduced-form estimates testing the random assignment of filings to judges. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases and allowed mortgage cramdown in this period. The estimates are from an OLS regression of judge leniency on the variables listed and office-by-month-of-filing fixed effects. Judge leniency, measured between 1989 and 1993, is the leave-one-out mean rate of granting bankruptcy protection for the assigned judge minus the leave-one-out mean rate of granting bankruptcy protection for the court in the same filing year. The p -value reported is for a F -test of the joint significance of the variables. Standard errors are clustered at the office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

	Leniency (1)
Age	-0.000118 (7.82e-05)
Female	-0.00389 (0.00263)
Percentage white (ZIP code)	0.00549 (0.00499)
Percentage single (ZIP code)	-0.0318 (0.0215)
Percentage college degree (ZIP code)	-0.0483 (0.0313)
ln (Median income) ZIP code	0.000280 (0.000687)
Joint F-test	0.3108
Office x Month FE	Y
Observations	6,100
R-squared	0.719

Table 3. First stage

This table reports the first-stage estimates. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases and allowed mortgage cramdown in this period. Judge leniency, measured between 1989 and 1993, is the leave-one-out mean rate of granting bankruptcy protection for the assigned judge minus the leave-one-out mean rate of granting bankruptcy protection for the court in the same filing year. All regressions include office-by-month-of-filing fixed effects. Standard errors are clustered at the office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

	Discharge		
	(1)	(2)	(3)
Leniency	0.894*** (0.0311)	0.895*** (0.0316)	0.891*** (0.0315)
Age		0.000891 (0.000605)	0.000952 (0.000597)
Female		-0.0468*** (0.0120)	-0.0430*** (0.0123)
Percentage white (ZIP code)			0.0772** (0.0332)
Percentage single (ZIP code)			-0.276* (0.144)
Percentage college degree (ZIP code)			-0.0946 (0.121)
In (Median income) zip code			0.000597 (0.00259)
Office x Month FE	Y	Y	Y
Observations	6,100	6,100	6,100
R-squared	0.211	0.214	0.215

Table 4. The effect of Chapter 13 in cramdown courts on homeowners' distress events
This table reports two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection in courts that allowed mortgage cramdown on homeowners' distress events. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases and allowed mortgage cramdown in this period. Columns 1 and 2 report estimates for the three-year post-filing outcomes, with and without any controls, respectively. Columns 3 and 4 present the estimates for the five-year post-filing outcomes. Home foreclosure is an indicator for a filer's home receiving a notice of default, transfer or sale, or having been transferred to a real estate owned in or before the indicated year. Involuntary sale is an indicator for when a homeowner sells her property for less than the amount due on the mortgage in or before the indicated year. Controls include age and gender of the filer, and zip-code-level controls are the percentage of white population, percentage of single individuals, percentage of individuals with a college degree, and median log income. All regressions include office-by-month-of-filing fixed effects. Standard errors are clustered at the office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Panel A

	Foreclosure 3		Foreclosure 5	
	(1)	(2)	(3)	(4)
Discharge	-0.264*** (0.0346)	-0.263*** (0.0324)	-0.291*** (0.0340)	-0.287*** (0.0335)
Controls	N	Y	N	Y
Office x Month FE	Y	Y	Y	Y
Control group mean	0.238	0.238	0.262	0.262
Observations	6,100	6,100	6,100	6,100
R-squared	0.088	0.090	0.094	0.097

Panel B

	Involuntary sale 3		Involuntary sale 5	
	(1)	(2)	(3)	(4)
Discharge	-0.236*** (0.0419)	-0.240*** (0.0409)	-0.258*** (0.0402)	-0.263*** (0.0391)
Controls	N	Y	N	Y
Office x Month FE	Y	Y	Y	Y
Control group mean	0.181	0.181	0.191	0.191
Observations	6,100	6,100	6,100	6,100
R-squared	0.047	0.048	0.035	0.036

Table 5. The effect of Chapter 13 in cramdown courts on other outcomes
This table reports two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection in courts that allowed mortgage cramdown on other filers' outcomes. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases and allowed mortgage cramdown in this period. Most of the outcomes are measured five years post-filing. New address is an indicator for the filer having at least one change of the principal address in or before the indicated year. The variable $\ln(\text{Num. new addresses})$ is the natural logarithm of the total number of principal addresses registered in or before the indicated year. Voluntary sale is an indicator for a property sale different from a short home sale in or before the indicated year. Moving to a better ZIP is an indicator for the filer moving for the first time post-filing to a ZIP code with a median income higher than the ZIP code at the time of bankruptcy filing. New property is an indicator for the filer buying a new property in or before the indicated year. Mortality is an indicator for dying in or before the indicated year. Controls are analogous to those in Table 4. All regressions include office-by-month-of-filing fixed effects. The mean of the control group is reported for those filers who did not receive Chapter 13 bankruptcy discharge. Standard errors are clustered at the office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Panel A

	New address 5 (1)	$\ln(\text{Num. new addresses})$ 5 (2)	Voluntary sale 5 (3)
Discharge	-0.195*** (0.0487)	-0.263*** (0.0895)	-0.0868** (0.0387)
Controls	Y	Y	Y
Office x Month FE	Y	Y	Y
Control group mean	0.769	0.709	0.186
Observations	6,100	6,100	6,100
R-squared	0.022	0.021	0.017

Panel B

	Moving to better a ZIP (1)	New property 5 (2)	Mortality 5 (3)
Discharge	0.0370*** (0.0112)	-0.0117 (0.0440)	0.00527 (0.0210)
Controls	Y	Y	Y
Office x Month FE	Y	Y	Y
Control group mean	0.023	0.121	0.029
Observations	6,100	6,100	6,100
R-squared	0.003	0.003	0.027

Table 6. The effect of Chapter 13 in cramdown courts by filer characteristics

This table reports two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection in courts that allowed mortgage cramdown on homeowners' distress events. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases and allowed mortgage cramdown in this period. The table reports estimates for the three-year post-filing outcomes with controls. Home foreclosure is an indicator for a filer's home receiving a notice of default, transfer or sale, or having been transferred to a real estate owned in or before the indicated year. Involuntary sale is an indicator for when a homeowner sells her property for less than the amount due on the mortgage in or before the indicated year. Controls are analogous to those in Table 4. All regressions include office-by-month-of-filing fixed effects. Standard errors are clustered at the office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Panel A

	Foreclosure 3						
	Age at filing			Gender		Property type	
	Lower 35 (1)	35-50 (2)	50 and up (3)	Male (4)	Female (5)	Single (6)	Multi (7)
Discharge	-0.266*** (0.0466)	-0.267*** (0.0318)	-0.247*** (0.0595)	-0.248*** (0.0292)	-0.361*** (0.132)	-0.276*** (0.0339)	-0.195*** (0.0690)
Controls	Y			Y		Y	
Office x Month FE	Y			Y		Y	
Observations	6,100			6,100		5,641	

Panel B

	Involuntary sale 3						
	Age at filing			Gender		Property type	
	Lower 35 (1)	35-50 (2)	50 and up (3)	Male (4)	Female (5)	Single (6)	Multi (7)
Discharge	-0.272*** (0.0319)	-0.245*** (0.0461)	-0.192** (0.0786)	-0.217*** (0.0332)	-0.410*** (0.118)	-0.257*** (0.0414)	-0.144* (0.0839)
Controls	Y			Y		Y	
Office x Month FE	Y			Y		Y	
Observations	6,100			6,100		6,100	

Table 7. Cramdown and non-cramdown in Chapter 13 bankruptcy

This table reports two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection on homeowners' distress events for courts that did and did not allow cramdown. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases in this period. Discharge is an indicator for a case being filed in a court that allowed cramdown at the timing of the filing. Non-cramdown is an indicator for a case being filed in a court that prohibited cramdown at the timing of the filing. Outcome variables and controls are analogous to those in Table 4. All regressions include office-by-month-of-filing fixed effects. Standard errors are clustered at the office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Panel A

	Foreclosure 3		Foreclosure 5	
	(1)	(2)	(3)	(4)
Discharge x Cramdown	-0.264*** (0.0345)	-0.267*** (0.0327)	-0.291*** (0.0339)	-0.294*** (0.0316)
Discharge x Non-cramdown	-0.0384*** (0.00485)	-0.0392*** (0.00497)	-0.0513*** (0.0121)	-0.0526*** (0.0118)
<i>p</i> -value	0.000	0.000	0.000	0.000
Controls	N	Y	N	Y
Office x Month FE	Y	Y	Y	Y
Observations	14,517	14,517	14,517	14,517
R-squared	0.070	0.071	0.074	0.075

Panel B

	Involuntary sale 3		Involuntary sale 5	
	(1)	(2)	(3)	(4)
Cramdown	-0.232*** (0.0392)	-0.234*** (0.0377)	-0.253*** (0.0375)	-0.256*** (0.0365)
Non-cramdown	-0.0517*** (0.00884)	-0.0522*** (0.00894)	-0.0483*** (0.0128)	-0.0483*** (0.0126)
<i>p</i> -value	0.000	0.000	0.000	0.000
Controls	N	Y	N	Y
Office x Month FE	Y	Y	Y	Y
Observations	14,517	14,517	14,517	14,517
R-squared	0.039	0.039	0.027	0.028

Table 8. Compliers' characteristics: Cramdown and non-cramdown

This table presents the characteristics of compliers. Column 1 reports the distribution of the sample by gender and age, $P(X = x)$. Column 2 shows the first-stage estimates for each gender and age group. Column 3 reports the distribution of compliers by gender and age, $P(X = x|I_1 > I_0)$, calculated as the first-stage estimate for the gender minus age group times the sample share, divided by the overall first-stage estimate. Column 4 shows the relative likelihood of a filer belonging to a particular gender and age group , in the complier group compared with the sample. Panel A reports the compliers characteristics for the cramdown sample, whereas Panel B presents the compliers characteristics for the non-cramdown sample.

Panel A

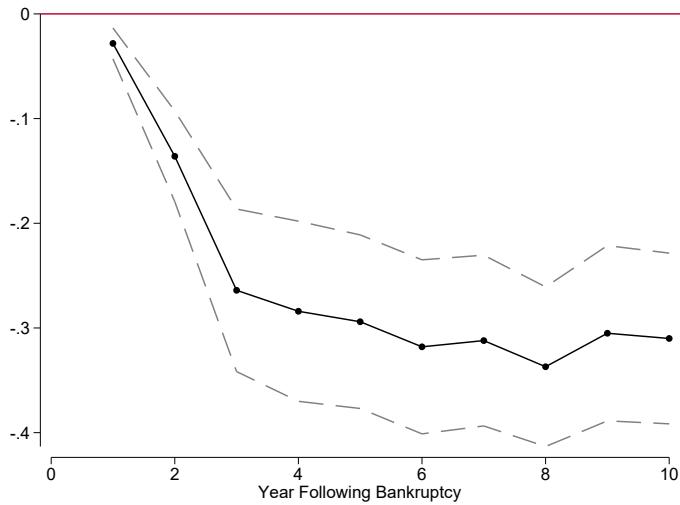
	$P(X = x)$	First stage	$P(X = x I_1 > I_0)$	$P(X = x I_1 > I_0) / P(X = x)$
	(1)	(2)	(3)	(4)
Men				
Age<35	0.207	0.998	0.231	1.116
35<=Age<=50	0.433	0.886	0.430	0.991
Age>50	0.174	0.972	0.189	1.087
Women				
Age<35	0.043	1.003	0.048	1.122
35<=Age<=50	0.092	0.641	0.066	0.717
Age>50	0.051	0.858	0.049	0.960
Overall	1.000	0.894	1.000	1.000

Panel B

	$P(X = x)$	First stage	$P(X = x I_1 > I_0)$	$P(X = x I_1 > I_0) / P(X = x)$
	(1)	(2)	(3)	(4)
Men				
Age<35	0.229	0.931	0.239	1.041
35<=Age<=50	0.377	0.991	0.418	1.109
Age>50	0.151	0.975	0.165	1.091
Women				
Age<35	0.064	1.127	0.081	1.261
35<=Age<=50	0.122	0.916	0.125	1.025
Age>50	0.057	0.763	0.049	0.853
Overall	1.000	0.894	1.000	1.000

Internet Appendix

Panel A. Cramdown courts



Panel B. Non-cramdown courts

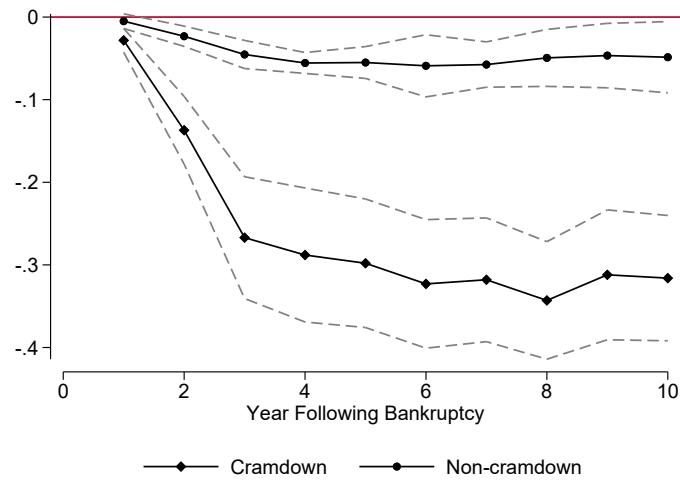


Figure IA.1. Any distress event in cramdown and non-cramdown courts

These figures plot two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection on any distress event in cramdown and non-cramdown courts. Any distress event is similar to the foreclosure indicator described in the Figure 4 variable plus other events, such as real-estate-owned liquidation (REO) in or before the indicated year. Panel A depicts the estimates for any distress events in courts that allowed cramdown in Chapter 13, whereas Panel B presents the estimates for non-cramdown courts. The dashed lines represent 95% confidence intervals from standard errors clustered at the office-by-judge level.

Table IA.1. The effect of Chapter 13 in cramdown courts on foreclosure in recession periods

This table reports two-stage least squares estimates of the impact of Chapter 13 bankruptcy protection in courts that allowed mortgage cramdown on foreclosures during recessions. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases in this period. Recession is an indicator variable for a case being filed between July 1990 and March 1991 (NBER). Outcome variables and controls are analogous to those in Table 4. All regressions include office-by-month-of-filing fixed effects. Standard errors are clustered at office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

	Foreclosure 3	
	Recession (1)	Non-recession (2)
Discharge	-0.238*** (0.0607)	-0.256*** (0.0262)
Controls		Y
Office x Month FE		Y
Observations	6,100	

Table IA.2. The effect of judge leniency on foreclosure for young females

This table reports the reduced-form estimates of the impact of leniency on foreclosure. The sample consists of all first-time Chapter 13 filers between 1989 and 1993 in the district courts that randomly assigned cases in this period and that allowed cramdown. Below is an indicator variable equal to one if the age at filing is lower than 35. Outcome variables and controls are analogous to those in Table 4. All regressions include office-by-month-of-filing fixed effects. Standard errors are clustered at office-by-judge level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

	Foreclosure 3 (1)	Foreclosure 5 (2)
Leniency	-0.219*** (0.0280)	-0.267*** (0.0316)
Female	0.0133 (0.0119)	0.0112 (0.0124)
Below 35	0.0116 (0.0152)	0.0122 (0.0160)
Leniency x Female x Below 35	-0.196 (0.129)	-0.233** (0.113)
Leniency x Below 35	-0.0388 (0.0534)	0.00862 (0.0557)
Leniency x Female	-0.0179 (0.0845)	0.0358 (0.0742)
Female x Below 35	-0.0291 (0.0305)	-0.0409 (0.0284)
Controls	Y	Y
Office x Month FE	Y	Y
Observations	6,100	6,100
R-squared	0.010	0.011