Bankruptcy Law and The Cost of Credit:
The Impact of Cramdown on Mortgage Interest Rates*

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Abstract
Recent proposals to address housing market troubles through principal modification could increase the cost of credit in the mortgage market. We explore this possibility using historical variation in federal judicial rulings regarding whether Chapter 13 bankruptcy filers could reduce the principal owed on a home loan to the home’s market value. The practice, known as cramdown, was definitively prohibited by the Supreme Court in 1993. We find that home loans closed during the time when cramdown was allowed had interest rates 12-16 basis points higher than loans closed in the same state when cramdown was not allowed, which translates to a roughly one percent increase in monthly payments. Consistent with the theory that lenders are pricing in the risk of principal modification, interest rate increases are higher for the riskiest borrowers and zero for the least risky, as well as higher in states where Chapter 13 filing is more common.

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1 Introduction

The bursting of the housing bubble has left millions of American homeowners underwater on their mortgages. Estimates from the last quarter of 2011 suggest that over eleven million households, or nearly a quarter of mortgagors, are underwater, with many owing more than 150% of the value of their property.\(^1\) The more than $700 billion in negative equity has been cited as a critical factor contributing to foreclosures, preventing the housing market from clearing, and delaying macroeconomic recovery by impeding consumer spending (Mayer, Pence, and Sherlund 2009, Case, Quigley, and Shiller 2011, Mian and Sufi 2011, Dynan 2012).

Despite general recognition of the problems created by negative equity, there has been little in the way of voluntary principal reduction by lenders or mortgage servicers. The largest mortgagees in the country, Fannie Mae and Freddie Mac, prohibit principal reduction outright. Portfolio lenders are often reluctant to write-down principal because of the loss recognition consequences. Third-party servicers are sometimes contractually prohibited from modification and are often incentivized to foreclose or undertake other types of modifications (Gelpern and Levitin 2009, Levitin and Twomey 2011). Government action has tried to encourage principal reduction with limited success. The federal government’s Home Affordable Modification Program includes a Principal Reduction Alternative that pays servicers up to 21 cents for every dollar of mortgage debt they forgive. The landmark federal-state mortgage servicing fraud settlement announced in February 2012 calls for at least $10 billion in principal reductions. These developments, however, have been modest in scale relative to the scope of negative equity nationwide.

During the early years of the housing crisis, recognition of the various frictions that impede loan modification, and in particular principal reduction, led to proposals to permit mortgages to be modified in personal bankruptcy proceedings without the consent of the mortgagee (Levitin 2009). Involuntary modification of mortgages in bankruptcy was designed to cut through transactional frictions, as well as to encourage voluntary modifications outside of bankruptcy. These proposals, known as “cramdown” or “stripdown” would have resulted in the underwater portion of mortgage loans being treated as unsecured loans in bankruptcy, and therefore dischargeable by the debtor for pennies on the dollar. The cramdown proposal took the form

of highly contentious legislation that passed the House of Representatives in 2008, but which failed in 2009 to achieve the requisite 60 votes for cloture in the Senate, despite the endorsement of President Obama.

Opponents of this legislation argued that it would substantially increase the cost of mortgage credit going forward. The Mortgage Bankers Association, which led the lobbying against the legislation, contended that cramdown would result in a 150 or 200 basis point increase in the average cost of mortgages. The authors of that study admitted, however, that “The number is an approximation, as there is no market parallel from which we can make exact comparisons.” In other words, at that point, no rigorous empirical evidence existed with which to forecast the impact of cramdown legislation on credit markets.

In this paper, we provide the first such evidence, using a quasi-experiment to test the impact of bankruptcy cramdown on mortgage interest rates. Between 1978 and 1993, a number of bankruptcy, district and circuit courts throughout the United States issued varying opinions on the permissibility of mortgage cramdown under federal bankruptcy law. In 1993, the Supreme Court declared the practice impermissible under the law, citing in part legislative history suggesting concern about the impact of cramdown on the cost of credit. The legal variation between judicial districts and over time allows us to test cramdown’s impact on mortgage interest rates and other characteristics using a difference-in-difference strategy. We find evidence that home loans closed during the time when cramdown was allowed had interest rates 12-16 basis points higher than loans closed in the same state when cramdown was not allowed, which translates to a roughly one percent increase in monthly payments. Consistent with the theory that lenders are pricing in the risk of principal modification, interest rate increases are higher for the riskiest borrowers and zero for the least risky, as well as higher in states where Chapter 13 filing is more common.

Our paper makes two contributions. First, it provides clear empirical evidence about the impact of cramdown on credit markets. We are aware of little prior research on this question. Using an equilibrium model of consumer default, Luzzetti and Neumuller (2012) estimate little or no impact of cramdown on default rates and house prices but do not estimate its impact on the equilibrium cost of credit. Fitzpatrick IV and Thomson (2010) review evidence from the 1980s farm foreclosure crisis, during which Congress enacted legislation permitting cramdown for bankruptcy filers under the newly created Chapter 12. They cite an

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See the December 16, 2008 letter from the Mortgage Bankers Association to Senator Richard Durbin available from the authors or at http://www.mortgagebankers.org/files/Advocacy/2008/MBAAnswersSenatorDurbinsQuestiononBankruptcy.pdf. The MBA’s impact claim and analysis changed over time (Levitin 2009).
earlier survey of a “small group of bankers”, who reported little change in the interest rates they were granting to farmers, though it is difficult to separate the impact of cramdown from the changing economic environment at that time. We believe that our paper is thus the first to provide well-identified estimates of the impact of cramdown on the cost of credit.

Our second, more general, contribution is to the literature on the impact of bankruptcy law on credit markets, a surprisingly limited area given the centrality of credit availability and cost impact claims to policy debates over bankruptcy reform. The bulk of this research has focused on the impact of exemptions that protect property from creditor attachment, exploiting variation between states and over time in the maximum value of such exemptions. These studies reach conflicting conclusions about the impact of higher exemption levels on home, car and small business loans, with some finding higher interest rates and lower loan volumes (Gropp, Scholz, and White 1997, Lin and White 2001, Berkowitz and White 2004) and others finding no discernible effect (Berkowitz and Hynes 1999, Chomsisengphet and Elul 2006). Relatedly, Pence (2006) finds lower home loan volumes in states with judicial foreclosure requirements that substantially slow down the foreclosure process. Our paper is the first to use judicial rulings as a source of exogenous variation in the state of bankruptcy law and is the first to show differential impacts of bankruptcy law by the risk to the lender of a given loan ending up in bankruptcy.

A brief outline of our papers is as follows. In section 2, we define cramdown and discuss its legal history. In sections 3 and 4, we describe the data and empirical strategy at the heart of this paper. In section 5, we discuss our empirical results. Section 6 concludes with a discussion of the implications of these results for legal and economic policy.

2 Cramdown

Consumer bankruptcy comes in two main flavors, referred to by their chapter in the United States Bankruptcy Code: Chapter 7 liquidations and Chapter 13 repayment plans. In Chapter 7, the debtor surrenders all assets, other than a limited subset of statutorily “exempt” assets, for distribution to creditors. This means that in most circumstances a Chapter 7 debtor will not be able to retain his or her home. In Chapter 13,

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3 We limit our focus here to research that engages seriously with problems of causal inference.

4 For an overview of bankruptcy law and recent empirical research, see White (2011).
in contrast, the debtor usually retains all of his property, but must devote all disposable personal income for the next three or five years to repaying creditors under a court-supervised repayment plan and budget. Debtors seeking to retain major property, such as a residence, typically file for Chapter 13, although there is significant geographical and racial variation in the propensity to use Chapter 13 (Braucher, Cohen, and Lawless 2012).

In a Chapter 13 bankruptcy, the debtor proposes a 3-5 year repayment plan that, if it complies with the relevant statutory requirements, will be confirmed by the court. During the plan period, creditors may not attempt to collect pre-bankruptcy debts other than through the bankruptcy process. If the debtor completes the repayment plan, then the debtor receives a discharge of unpaid pre-bankruptcy debts. If the debtor fails to complete the repayment plan, however, the bankruptcy case will be dismissed without a discharge, and creditors may then resume their collection activities.

Chapter 13 debtors have a great deal of leeway in structuring their repayment plans. A Chapter 13 debtor is able to restructure almost all types of debts, with the repayment plan able to specify changes in interest rates, amortization, and terms of loans. A Chapter 13 repayment plan may also “cram down” undersecured (or “underwater”) debts, those secured by collateral worth less than the amount of the debt. Cramdown bifurcates the undersecured creditor’s claim into a secured claim for the value of the collateral and a general unsecured claim for the difference between the loan amount and the collateral’s value (the “deficiency”). This distinction matters because a Chapter 13 plan must pay a secured creditor the value of its secured claim, while a general unsecured claim is guaranteed only as much as would be paid out in a Chapter 7 liquidation, typically very little or nothing (Jimenez 2009). In recent years, general unsecured debt in Chapter 13 cases has traded at about 10-15 cents on the dollar (Levitin 2010). Therefore, from a lender’s perspective, cramdown is equivalent to a forced principal reduction on the debt to the value of the collateral, based on a judicial rather than a market valuation. Cramdown is likely to result in a near complete loss of the underwater portion of the debt if the bankruptcy plan is completed.

While Chapter 13 permits restructuring of almost all types of debts, it explicitly excludes certain home mortgage loans. 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. §1322(b)(2)). As explicated in judicial decisions, bankruptcy
judges can thus modify loans on vacation homes, investor properties, multifamily residences in which the
owner occupies a unit, and wholly unsecured second mortgages on their principal residences, as well as loans
secured by yachts, jewelry, household appliances, furniture or vehicles. The Bankruptcy Code thus prevents
modification only of mortgages secured solely by real property that is the debtor’s principal residence. Such
mortgage loans must be cured and then paid off according to their original terms, including all fees that
have been levied since default, or else the bankruptcy automatic stay will be lifted, permitting the mortgagee
to foreclose on the property (Levitin 2009). As a result, if a debtor’s financial distress stems from an
unaffordable home mortgage, bankruptcy is unable to help the debtor retain her home, and foreclosure will
occur.

From the enactment of the Bankruptcy Code in 1978, up until mid-1993, some federal courts interpreted
the Bankruptcy Code as prohibiting mortgage modification in general but permitting cramdown in particular.
That is, a loan could not be modified, but these courts did not see cramdown as modifying the loan. Instead,
they understood cramdown to simply be determining the classification of the loan in bankruptcy, namely
that under a generally applicable bankruptcy principal, the amount of the claim classified as secured was
limited to the value of the collateral. In 1993, however, the Supreme Court ruled on the issue in a case
called Nobelman v. American Savings Bank, holding unanimously that cramdown was a form of mortgage
modification and therefore prohibited in Chapter 13.

While the Court’s ruling was based on statutory interpretation, rather than policy analysis, Justice
Steven’s concurring opinion emphasized a policy rationale, namely that bankruptcy’s special protection
for home mortgage lenders is designed to enable lenders to offer lower interest rates and thus encourages
home ownership: “At first blush it seems somewhat strange that the Bankruptcy Code should provide less
protection to an individual’s interest in retaining possession of his or her home than to other assets. The
anomaly is, however, explained by the legislative history indicating that favorable treatment of residential
mortgagees was intended to encourage the flow of capital into the home lending market.”

The implicit model underlying such logic is that the equilibrium interest rate in the market for home
loans is determined by the expected return to lenders of such loans. This, in turn, consists of the weighted
average of the returns from the loan in various bankruptcy states, where the weights are the probabilities that

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a given loan ends up in such a state (Berkowitz and Hynes 1999). Cramdown lowers the expected return from a loan should the borrower end up in Chapter 13. This model thus predicts that permitting cramdown should raise interest rates more for those at greatest ex ante risk of filing for bankruptcy under Chapter 13. This varies between loans both because of variation in a borrower’s own credit risk and the geographic variation in the use of Chapter 13. We exploit both of these aspects of risk in the analysis below.

3 The Data

We collect data for all judicial rulings on the permissibility of cramdown from federal bankruptcy, district and circuit courts between October 1979, the effective date of the Bankruptcy Code, and June 1993, the date of the Supreme Court’s decision in Nobelman v. American Savings Bank that cramdown was not permissible under the Code. During this time period, there were roughly 60 such rulings in bankruptcy and district courts and four such rulings in circuit courts. Nearly 40 of those lower court rulings and three of the four circuit court rulings held that cramdown was permissible. The first of these circuit court rulings permitting cramdown was the 9th Circuit’s textitIn re Hougland in November 1989 and the last was the 2nd Circuit’s In re Bellamy in April 1992.[6]

We construct a variable called Cramdown, which indicates whether cramdown was allowed by judicial ruling in state and month. We assume that prior to any judicial ruling, cramdown was not allowed, in which case Cramdown has value zero. Cramdown has value one in states where all lower courts or a circuit court have ruled in favor of cramdown. In states where only some lower courts have allowed cramdown or where lower courts have conflicting rulings, we assign Cramdown a value equal to the raw average of the permissibility of cramdown across that state’s lower courts. For example, Cramdown would have a value of 0.5 in state with one lower court ruling in favor of cramdown and another lower court not having yet ruled on the issue. Though it might be appropriate to construct an average weighted by size of the housing market, such data are difficult to obtain at the federal district level. If using a raw average introduces classical measurement error into our right-hand side variable, our coefficients will be underestimates of the true effect of allowing cramdown.

We collect bankruptcy filing data from the American Bankruptcy Institute, which publishes by state and

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6A complete list of these rulings is available from the authors upon request.
year the number of bankruptcy filings under each chapter of the Bankruptcy Code. Our main use of such data is to explore whether judicial rulings on cramdown have a larger effect on the mortgage market in states where Chapter 13 bankruptcy filings are more common.\footnote{We have tried to use this data to estimate the impact of cramdown on bankruptcy filing rates, but the historical data is available only at the annual level, preventing us from exploiting the precise timing of the judicial rulings that serve as our source of variation. The resulting estimates are too noisy to draw any useful conclusions.} Using population statistics from the Statistical Abstract of the United States, we assign to each state a measure of Chapter 13 intensity as of 1987, prior to the vast majority of cramdown rulings, which we define as the number of Chapter 13 filings per 1,000 residents in the state.

Our primary outcomes of interest are the cost and quantity of credit in the home loan market. We use the Federal Housing Finance Agency’s Monthly Interest Rates Survey (MIRS), which asks mortgage lenders to report the terms on all single-family loans that are closed on the last five business days of each month. The survey excludes multifamily loans, mobile home loans, mortgage refinance loans, loans insured by the Federal Housing Administration and loans guaranteed by the Veterans Administration. MIRS contains information on each loan’s interest rate, principal, term, house price, fixed- or adjustable-rate structure, and lender type (savings association, mortgage company, commercial bank, or savings bank).

Table 1 describes the variables from the merged data set in which we assign to each loan in MIRS the value of Cramdown in the state and month that the loan was closed. Because the vast majority of the judicial rulings occurred between 1989 and mid-1993, we limit the sample to loans closed between January 1987 and December 1996, as shown in the first row of the table. The final data set contains over 1.1 million individual loans. The rest of panel (A) shows that, in this time period, 19% of loans were closed in states and months in which cramdown was allowed by judicial ruling. Circuit rulings covering multiple states account for 13% of this total while lower court rulings account for 6% of the total. The final row of the panel shows that the average loan was issued in a state that, in 1987, had a Chapter 13 filing rate of 0.5 per 1,000 residents. This rate varied widely between states, with a minimum of 0.01 (in Vermont) and a maximum of 2.76 (in Tennessee).

Panel (B) shows some of the outcomes of interest in this paper, namely the measures of the quantity and price of credit. The average principal of a loan in the MIRS data over this time period was $112,000, with an average loan-to-value ratio of 77%.\footnote{This measures the ratio of the loan principal to the price of the home.} The effective interest rate, which is the stated interest rate on
the loan plus the implied interest cost of any fees associated with the loan, averaged 8.22%. Panel (C) shows other characteristics of these loans, including average term (nearly 28 years), the fraction that have adjustable rates (42%), and the types of lenders (64% are traditional savings banks and 27% are mortgage companies).

4 Empirical Strategy

Figures 1 and 2 show two different measures of the extent to which the various judicial rulings on cramdown changed the legal environment. Figure 1 shows the fraction of states in a given month in which at least one judicial decision allowing cramdown was in force. At the start of this time period, in January 1987, only a handful of states had experienced such rulings. That number rose relatively slowly until October 1989, when the Ninth Circuit issued a ruling allowing cramdown in *Hougland v. Lomas & Nettleton Co.* The fraction of states with such rulings then continued a fairly steady climb until the issue reached the Supreme Court, which in June 1993 ruled in *Nobelman v. American Savings Bank* that the Bankruptcy Code should not be interpreted to allow cramdown under Chapter 13. That ruling disallowed cramdown in all states. Figures 2 shows the fraction of loans in our data issued under cramdown-allowing judicial regimes. This panel can be thought of as a version of panel (A) in which each state is weighted by the number of loans issued in that state and month. The sharp rise in October 1989 highlights the large fraction of the home loan market covered by the Ninth Circuit decision, relative to the decisions of smaller jurisdictions at other times. Figures 1 and 2 show that, by early 1993, judicial rulings allowing cramdown applied to over 30 states and covered about 60% of the home loans issued in the United States.

These two figures highlight a simple way to think of this quasi-experiment. At the start of this time period, cramdown was allowed in very few jurisdictions. Between 1989 and 1993, cramdown became legal in a large number of jurisdictions. Then, in June 1993, the Supreme Court returned the US to its prior state, in which cramdown was not allowed anywhere. The quasi-experiment is thus driven by the fact that, for a 3-4 year window, cramdown was unexpectedly made legal in some jurisdictions but not in others. This fact suggests the use of a difference-in-difference strategy estimating whether the differences in home loan

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9 We focus on the effective interest rate rather than the stated interest rate because lenders could potentially compensate for cramdown risks by increasing up front fees rather than the interest rate. In practice, the difference between these two quantities is small, on the order of 20 basis points on average. Our results are unaffected by the choice of which interest rate measure to use.
conditions between cramdown-allowing states and cramdown-forbidding states was different in the period when cramdown was allowed relative to the periods before and after.

We employ this strategy but augment it by exploiting a few further facts highlighted in Figures 3, 4, and 5. First, as seen in Figure 3, states differed not only according to whether cramdown was ever allowed by judicial ruling but also in the timing of such rulings. Six states had rulings allowing cramdown as early as 1987-88, while the remaining states are relatively evenly split between first rulings in 1989-90, first rulings in 1991-92, and never having rulings allowing cramdown. This differential timing provides an additional source of variation that we exploit in our subsequent regression analysis, allowing us to separate the effect of the judicial rulings from other contemporaneous factors affecting the nation as a whole.

Figures 4 and 5 highlight two further sources of heterogeneity we explore. Figure 4 reveals that, in addition to the differential timing of judicial rulings, the highest level of cramdown ruling also varied by state, with some states subject only to lower court rulings and other eventually subject to circuit court rulings. Given that lower court rulings can be overturned by circuit courts, we might expect markets to react more strongly to circuit court rulings that have a higher likelihood of becoming a permanent feature of the legal environment. We explore this hypothesis in the subsequent analysis.

We also explore in the subsequent analysis the extent to which the bankruptcy environment interacts with these judicial rulings. As Figure 5 shows, there is geographic variation in the extent to which residents of a given state file for bankruptcy under Chapter 13, with such filings more common in the South and West. We might expect markets to react more strongly to judicial rulings allowing cramdown in states where Chapter 13 filings are more common. In these states, lenders might expect lower returns on loans because of the higher probability that loans would end up in Chapter 13 and thus potentially being crammed down.

We thus exploit the facts that states differed both in the extent to which cramdown was ever allowed and the timing of such rulings. We do so by implementing difference-in-difference regressions of the form:

\[
y_{lsm} = \beta_0 + \beta_1 \text{Cramdown}_{sm} + \mu_s + \lambda_m + X_{lsm} + \epsilon_{lsm} \tag{1}\n\]

Here \(Y\) is a characteristic, such as an interest rate or principal amount, of loan \(l\) closed in state \(s\) in month \(m\). The variable \(\text{Cramdown}\) measures the extent to which cramdown is allowed in that state and month, as defined previously. State fixed effects \(\mu\) control for any differences between states that are constant across
time, such as differing provisions in state laws. Month fixed effects $\lambda$ control for any differences between months that are constant across states, such as shocks to the national economy or interest rate changes by the Federal Reserve. We control in some specifications for $X$, a vector of loan characteristics including the loan’s term, its loan-to-value ratio, an indicator for adjustable rate, and indicators for each type of lender.

The inclusion of state and month fixed effects means that $\beta_1$, the coefficient of interest, is identified by within-state changes in the legal status of cramdown, controlling for monthly nationwide shocks. This means that the observed correlations between cramdown rulings and loan conditions such as interest rates cannot be caused by differences across states with differing cramdown rulings or by correlations between the timing of rulings and nationwide shocks.

For certain outcomes, we run versions of the above regression in which we collapse the data to state-month cells by mean or various percentiles:

$$Y_{sm} = \beta_0 + \beta_1 Cramdown_{sm} + \mu_s + \lambda_m + \epsilon_{sm} \quad (2)$$

In all specifications, the error term $\epsilon$ may have an unobserved component correlated within states across time, so we cluster the standard errors at the state level to account for such serial correlation.

5 Empirical Results

Panel (A) of Table 2 shows the mean impact of cramdown rulings on the equilibrium price and quantity of home loans. In columns (1)-(4), we explore the impact of cramdown rulings on the price of credit as measured by the effective interest rate on these home loans. In column (1), which controls only for state and month fixed effects, the coefficient implies that the cramdown rulings led to a statistically significant rise in the interest rate of 12 basis points. Column (2) shows that this estimate is unchanged by the inclusion of state-specific linear time trends and state-level monthly unemployment rates, suggesting that cramdown rulings are not more likely in states with a prior interest rate trajectory nor are correlated in time with local economic conditions. In column (3), the estimated impact of allowing cramdown rises slightly to 14 basis points when we control for loan characteristics such as term, loan-to-value ratio, adjustable rate status, and lender type. Finally, in column (4), we exclude from the sample the subset of states in which no judicial
ruling in this period ever permitted cramdown, on the theory that such states may differ fundamentally from states with such rulings and thus might not be ideal controls. This exclusion raises the estimated impact of allowing cramdown to 16 basis points. These robust results provide clear evidence that such rulings led to a rise in the cost of credit, on the order of 12-16 basis points.

Figure 6 provides visual evidence of this effect by dividing states into those where circuit courts eventually ruled cramdown permissible and those where no such ruling was ever issued. Vertical lines in November 1989 and June 1993 respectively represent decisions in *Houghland*, the first such circuit court ruling, and *Nobelman*. The period between those lines thus represents the greatest extent to which cramdown was allowed. Prior to any circuit court rulings, states where circuit courts would eventually rule cramdown permissible had mean effective interest rates substantially lower than states with no such rulings. After the *Houghland* decision, the gap between these two sets of states narrowed considerably, particularly in 1992 and 1993 once the other three circuit court decisions had been issued. That gap then re-opened after the *Nobelman* decision. The period during which cramdown was most permitted was therefore the period of highest relative interest rates between these two sets of states. It is also worth noting the lack of differential trends in interest rates between these two sets of states in the period prior to the *Houghland* decision, which explains why including state-specific time trends has little impact on the coefficient estimates.

Columns (5)-(8) use as outcomes four different measures of the quantity of credit transacted in a given market. Columns (5) and (6) use as outcomes the logarithm of each loan’s principal amount and loan-to-value ratio. Neither coefficient provides evidence that these judicial rulings affected loan quantities. Column (7) uses as an outcome an indicator for a loan’s loan-to-value ratio exceeding 95%. Permitting cramdown reduces the fraction of such loans made by roughly one percentage point, perhaps because those loans are likely to end up as part of a bankruptcy proceeding. Column (8) collapses the data to state-month cells and uses as the outcome the logarithm of the number of loans closed in a given state and month. Permitting

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10 We also tested whether states with particularly high rates of Chapter 13 bankruptcy filings had unusually large impacts on these estimates. To do so, we re-estimated the cramdown coefficient by excluding one at a time each of the seven states containing districts with the highest Chapter 13 rates, as listed in Braucher, Cohen, and Lawless (2012). These exclusions never changed the estimated coefficient by more than one basis point and it always remained statistically significant. This held true even when all seven such states were excluded simultaneously.

11 We also performed a placebo test in which we randomly assigned each state the status of judicial rulings on cramdown from another state. We did this 100 times, each time estimating the cramdown coefficient from column (1) of Panel (A). The cramdown coefficient was positive and statistically significant in five of those 100 tests, exactly as we would expect by chance. This suggests that it is unlikely our finding is a statistical artifact, rather than a true impact of the judicial rulings.
cramdown reduces the number of loans issued by 0.7 percent but the result is statistically insignificant due to the large standard error on the estimate. Overall, these four columns provide little evidence of an impact of cramdown rulings on the quantity of loans transacted in these markets. This may ultimately be a matter of statistical precision. OLS estimates using the MIRS data suggest that a 12 basis point rise in interest rates is associated with a less than one percent decline in the mean principal of such loans. The 95% confidence interval in column (5) includes that value. The impact of cramdown rulings on interest rates may simply be too small to detect a corresponding change in loan quantities in this data.

Panel (B) interacts the cramdown measure with indicators for whether the highest ruling in a given month came from a circuit court or a lower court. The interest rate increase seen in panel (A) is driven entirely by the circuit court rulings on cramdown, with point estimates on such rulings ranging from 13-17 basis points. This is consistent with the theory that lenders in a given jurisdiction believe circuit court decisions to be much better predictors of the actual future state of the law than lower court decisions, which are overturned with some frequency. In other words, lower court rulings had much less impact than circuit court rulings on lenders’ beliefs about the expected returns to newly issued loans.

A similar pattern is seen in panel (C), which divides the data into two (overlapping) time periods in order to estimate whether the impact of rulings permitting cramdown had the same magnitude as the Supreme Court’s ruling forbidding it. The top row limits the data to the pre-Nobelman time period, so that nearly all changes in cramdown status come from bankruptcy, district and circuit courts ruling it permissible. The bottom row limits the data to the post-Bellamy period, after which the only change in cramdown status came from the Supreme Court’s ruling it impermissible. In all specifications, the Supreme Court’s decision lowers interest rates by a greater magnitude than the lower courts’ rulings had raise them. This difference is, however, statistically insignificant in all four specifications shown, and is particularly small in the final specification. Supreme Court rulings may influence lenders’ expectations more than the rulings of lower courts but these data provide only suggestive evidence to this effect.

As discussed earlier, cramdown permissibility should theoretically have the largest impact on loans at greatest risk of default. The MIRS data have no good proxy for risk, such as a credit score, so we instead explore the impact of cramdown on the full distribution of interest rates within a state in a given month. We assume that, in a given state and month, the loans with the highest interest rates are on average those
judged by lenders to be the riskiest. Loans with low interest rates, conversely, are those made to borrowers with high credit scores and thus little risk of default. We would therefore expect cramdown permissibility to have relatively small impacts on loans with low interest rates and relatively big impacts on loans with high interest rates.

Panel (A) of Table 3 confirms this prediction. Here we have collapsed the loan data to state-month cells, computing the mean and 10th through 90th percentiles of that distribution. We then run regressions with state and month fixed effects as before, but weight the regressions by the number of loans in each cell. Column (1) thus replicates our central result from column (5) of Table 2, showing that the mean impact of cramdown is a 12 basis point rise in interest rates. The remaining columns show no impact of cramdown on the 10th through 40th percentile of the interest rate distribution, loans likely made to the least risky borrowers. Higher percentiles of the interest rate distribution are, however, affected by cramdown rulings, with the 60th through 90th percentiles seeing interest rate increases of 21-35 basis points. This is consistent with the prediction that bankruptcy regulations affect credit markets for those most at risk of defaulting on loan obligations.

Because cramdown only affects those who file for bankruptcy under Chapter 13, theory also predicts that cramdown permissibility should have a larger impact in states where Chapter 13 is more commonly used. In panel (B) of Table 3, we interact cramdown permissibility with a measure of the Chapter 13 filing rate per thousand residents in 1987, prior to these rulings. The empirical results are consistent with the theoretical prediction. The coefficients on the interaction term are noisy zeroes for the least risky loans but become consistently positive and at least marginally significant for loans at and above the 70th percentile of the distribution. This is suggestive that, for the riskiest borrowers, cramdown permissibility raises interest rates more in states with higher Chapter 13 filing rates. Taken together, these two panels show consistent evidence that changes in bankruptcy regulations have the largest impact on risky borrowers in jurisdictions where the relevant form of bankruptcy is a likely outcome.

\[\text{We re-center this measure around zero so that the main effect is the mean effect measured in the prior table.}\]
6 Discussion and Conclusion

Using state- and month-level variation in judicial rulings as a source of exogenous variation in policy, we find that giving judges the power to modify home loans through principal reductions does, as theory predicts, raise the cost of credit. This provides some of the clearest evidence to date of the impact of bankruptcy law on credit markets.

Our point estimates suggest that the permissibility of cramdown raised interest rates on home loans by an average of 12-16 basis points, during a time period when the average interest rate on a mortgage was about 8.2%. That increase would have translated into about a 1% higher monthly payment over the course of a typical loan. That the impact was not larger may be explained by three factors. First, if losses in foreclosure would be high, cramdown may have little ultimate effect on a lender’s recovery. Second, Chapter 13 bankruptcy filings were relatively uncommon during the period in question, peaking at 0.6% of all residential mortgages, so that Chapter 13 cramdown would have been a comparatively rare occurrence. Third, the majority of Chapter 13 filings do not result in a completed repayment plan, so that lenders often end up foreclosing on the properties anyway. Therefore, even if cramdown were legally possible, the result in most bankruptcy cases would often be the same as would occur outside of bankruptcy, except to the extent that judicial valuation varies from market valuation.

Extrapolating from our results to current policy may therefore be challenging. Whether current attempts to legalize cramdown would result in similar impacts on interest rates depends on how current conditions differ from those in the 1980s and 1990s. On the one hand, the depressed macroeconomy drove the number of Chapter 13 filings in 2010 to nearly 440,000, 75% higher than the 1992 peak cited previously, which suggests that cramdown might have even larger impacts on lenders’ behavior than it did in the period we have studied. Moreover, were cramdown available, Chapter 13 bankruptcy filing would be more attractive to homeowners, which could increase filing rates. On the other hand, the depressed state of the housing market means that foreclosure losses might also be quite high, so principal modification might result in smaller

13 The formula for a monthly payment \( M \) on a 30 year loan with principal \( P \) and interest rate \( r \) is \( M = P \times (r/12)/(1-(1+(r/12))^{360}) \). Plugging in \( r = 0.0834 \) yields a monthly payment about 1% higher than the value obtained by plugging in \( r = 0.082 \) (taking 14 basis points as the average estimated increase).

14 During the period examined, annual Chapter 13 filings peaked at about 254,000 in 1992 (U.S. Courts Historical Statistics). The Census’s 1993 American Housing Survey lists 37.2 million mortgaged properties (Table 3-15). Furthermore, not all such filings involved homeowners with mortgages, and only some home mortgagors filing for Chapter 13 were both underwater and in judicial districts that permitted cramdown.
losses to lenders if the modified loans perform.

The one clear finding of ours that would certainly translate to the current environment is the heterogeneous impact of bankruptcy law generally and cramdown specifically on borrowers with differing credit risks. Our results suggest strongly that cramdown has little impact on the credit market for those at low risk of ending up both underwater and in bankruptcy. The riskiest borrowers bear the cost of the change in legal regime. As such, legislation permitting principal modification by bankruptcy judges can be thought of as a form of insurance against foreclosure for borrowers. Though lenders can currently purchase private mortgage insurance to protect against payment defaults by borrowers, the market does not appear to currently provide borrowers with such an insurance option. Though such insurance would be mandatory, in the sense that all borrowers are subject to the same legal regime in bankruptcy, our evidence shows that only the riskiest borrowers would ultimately pay for the privilege of such insurance. We leave for future research the question of whether cramdown may be efficiency-enhancing by creating a form of insurance that the private market does not currently provide.
References


Figure 1: States Permitting Cramdown

![Graph showing the number of states permitting cramdown over years from 1987 to 1997. The y-axis represents the number of states, while the x-axis represents the years starting from January. The graph shows a steady increase in the number of states permitting cramdown until 1994, after which the number remains constant.]
Figure 2: Loans Subject to Cramdown
Figure 3: First Year Cramdown Allowed in State
Figure 4: Highest Level of Cramdown Ruling
Figure 5: Chapter 13 Filings Per 1,000 Residents, 1987
Figure 6: Interest Rates over Time, by Eventual Circuit Court Ruling
Table 1: Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>(1) Mean</th>
<th>(2) St. dev.</th>
<th>(3) Minimum</th>
<th>(4) Maximum</th>
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<tr>
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</table>

Notes: Sample size is 1,145,277 loans. Chapter 13 filing rate measures filings per 1,000 residents in 1987 for each state. Principal is measured in thousands of current dollars. The loan-to-value measures the ratio of principal to home price. The effective interest rate is the stated interest rate plus the implied interest cost of any fees associated with the loan. Savings banks refers to federal- and state-chartered savings banks and savings and loans associations regulated by the Office of Thrift Supervision.
### Table 2: Mean Impact of Cramdown Rulings on Loan Price and Quantity

<table>
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<tr>
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<td>Ln(number of loans)</td>
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<tr>
<td>Cramdown allowed</td>
<td>0.119**</td>
<td>0.121**</td>
<td>0.136*</td>
<td>0.162**</td>
<td>0.015</td>
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<td>(0.045)</td>
<td>(0.061)</td>
<td>(0.038)</td>
<td>(0.021)</td>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.072)</td>
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<tr>
<td>Cramdown * circuit court</td>
<td>0.138**</td>
<td>0.130**</td>
<td>0.162**</td>
<td>0.168**</td>
<td>0.021</td>
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<td>(0.043)</td>
<td>(0.054)</td>
<td>(0.042)</td>
<td>(0.019)</td>
<td>(0.003)</td>
<td>(0.005)</td>
<td>(0.076)</td>
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<td>Cramdown * lower court</td>
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<td>-0.066</td>
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<td>-0.036</td>
<td>0.015**</td>
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<td>(0.031)</td>
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<td>1,145,277</td>
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<td>1,145,277</td>
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<td>5,993</td>
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<td>(C) Allowed vs. disallowed</td>
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<td>640,080</td>
<td>640,080</td>
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State trends and unemployment X
Loan characteristics X
Exclude never-permitting states X

Notes: Heteroskedasticity robust standard errors clustered by state are in parentheses (+ p < .10 * p < .05 ** p < .01). Coefficients shown come from regressing the listed outcome on an indicator for cramdown being allowed, as well as state and month fixed effects. Column 2 adds controls for linear time trends and monthly unemployment rates by state. Column 3 adds controls for each loan’s term, loan-to-value ratio, adjustable rate status, and lender type dummies. Column 4 excludes states in which cramdown was never permitted by any court. In column 8, data are collapsed to state-month cells. Panel A uses as an explanatory variable an indicator for whether cramdown was permitted in the given state and month. Panel B interacts that indicator with the highest level of court to allow cramdown. Panel C replicates panel A but limits the sample first to the pre-Nobelman period and then to the post-Bellamy period, in order to separately identify the impacts of lower and circuit court rulings allowing cramdown and the Supreme Court disallowing it.
Table 3: Impact of Cramdown Rulings by Risk to Lenders

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<tr>
<td></td>
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<td>P70</td>
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<td>P90</td>
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<tr>
<td>(A) By interest rate decile</td>
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<tr>
<td>Cramdown</td>
<td>0.119**</td>
<td>-0.039</td>
<td>-0.084</td>
<td>-0.049</td>
<td>0.037</td>
<td>0.131+</td>
<td>0.237*</td>
<td>0.345*</td>
<td>0.329*</td>
<td>0.206*</td>
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<tr>
<td></td>
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<td>(0.116)</td>
<td>(0.146)</td>
<td>(0.133)</td>
<td>(0.090)</td>
<td>(0.068)</td>
<td>(0.089)</td>
<td>(0.144)</td>
<td>(0.149)</td>
<td>(0.097)</td>
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<tr>
<td>(B) By Ch. 13 filing rate</td>
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<td></td>
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<td>0.119**</td>
<td>-0.039</td>
<td>-0.083</td>
<td>-0.048</td>
<td>0.038</td>
<td>0.132+</td>
<td>0.236**</td>
<td>0.344**</td>
<td>0.328**</td>
<td>0.206*</td>
</tr>
<tr>
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<td>(0.073)</td>
<td>(0.068)</td>
<td>(0.080)</td>
<td>(0.110)</td>
<td>(0.111)</td>
<td>(0.077)</td>
</tr>
<tr>
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<td>5,993</td>
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</table>

Notes: Heteroskedasticity robust standard errors clustered by state are in parentheses (+ p<.10 * p<.05 ** p<.01). All regressions include state and month fixed effects. Data are collapsed to 5,993 state-month cells and weighted by the number of loans in each cell. In panel (B), regressions include the interaction between cramdown and the demeaned state-level Ch. 13 filing rate as of 1987.