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## Auto credit and the 2005 Bankruptcy Reform: The impact of eliminating cramdowns

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Federal Reserve Bank of New York  
Staff Reports

# **Auto Credit and the 2005 Bankruptcy Reform: The Impact of Eliminating Cramdowns**

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Nathaniel Pattison

Staff Report No. 797  
October 2016



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## **Auto Credit and the 2005 Bankruptcy Reform: The Impact of Eliminating Cramdowns**

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### **Abstract**

Auto lenders were perhaps the biggest winners of the 2005 Bankruptcy Reform. Cars depreciate quickly, so borrowers often owe more than their car is worth. Prior to the Reform, these borrowers could reduce the principal on their auto loan to the market value of the car through a “cramdown” in Chapter 13 bankruptcy. The Reform prohibited cramdowns during the first two and a half years of an auto loan. This paper is the first to estimate the causal effect of this anti-cramdown provision on the price and quantity of auto credit. The authors use a novel empirical strategy that relies on the fact that eliminating cramdowns affected only one of the two types of consumer bankruptcy: Chapter 13. They exploit persistent historical variation in states’ usage of Chapter 13 generated by differences in local legal culture. Using difference-in-differences regressions, their empirical strategy compares pre-Reform and post-Reform auto loans across states with persistent historical differences in the share of bankruptcies filed under Chapter 13. They find that eliminating cramdowns decreased interest rates on auto loans in the average state by 15 basis points, with a larger decline in states where Chapter 13 is more common. The decline in interest rates occurs in the exact month that the Reform went into effect, and the authors rule out other aspects of the Reform as possible causes. Next, the authors estimate the effect on the quantity of auto credit. Using quarterly data from the FRBNY Consumer Credit Panel based on Equifax credit reports, they examine the effect of eliminating cramdowns on the number and size of new auto loans. The estimates show a small, negative, and insignificant impact on the number of new auto loans. The authors do find some evidence, however, that loan sizes increased among subprime borrowers.

**Key words:** bankruptcy, cramdown, auto loans, consumer credit, BAPCPA

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# 1 Introduction

The 2005 Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) introduced the most significant changes to bankruptcy law in thirty years. BAPCPA aimed to curtail “abusive” or “strategic” bankruptcy filings by restricting access to bankruptcy and reducing the benefits of filing. Proponents of the law argued that strategic bankruptcies increased the cost of consumer credit, claiming that bankruptcy was costing families as much as \$400 each year through higher interest rates (Warren, 2004). The restrictions placed on bankruptcy in BAPCPA were intended to provide a partial rebate of this cost by reducing the price of credit (Block-Lieb and Janger, 2006). Critics, however, were skeptical about whether creditors’ gains from BAPCPA would be passed on to consumers.<sup>1</sup> In this paper, we examine whether BAPCPA’s restrictions on bankruptcy led to lower interest rates and increased loan originations for one type of consumer credit: auto loans.

We focus on auto loans for two reasons. First, many consider auto lenders to be the biggest winners of BAPCPA (Braud, 2009, Leonhard, 2014, Whitford, 2007). Reflecting on the first five years of BAPCPA, Bankruptcy Judge Keith Lundin remarked, “That’s exactly where all the money went; it’s going to the car lenders” (Diehl et al., 2010). The reason auto lenders benefited is that BAPCPA essentially prohibited what is known as a “cramdown.” Cars depreciate quickly, so many borrowers will owe more than their car is worth. Prior to BAPCPA, a bankruptcy filer could reduce the principal on an undersecured auto loan to the market value of the car through a “cramdown” in bankruptcy. Auto lenders claimed that these cramdowns resulted in losses of hundreds of millions of dollars each year (Hamburger,

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<sup>1</sup>See Letter from 110 Law Professors to Hon. F. James Sensenbrenner and Hon. John Conyers, Jr. (March 11, 2005) in 151 Congressional Record H1974 and Simkovic (2009).

2001). The anti-cramdown provision of BAPCPA prohibited cramdowns during the first 2.5 years of an auto loan. Post-BAPCPA filers must repay the full original loan to keep their car, regardless of the market value of the vehicle and whether they are undersecured. Consequently, auto lenders now receive larger payments from debtors filing for bankruptcy.

The second reason we focus on auto loans is that the institutional features of the anti-cramdown provision allow us to identify its causal impact on credit markets. BAPCPA eliminated cramdowns only in Chapter 13 bankruptcy, but in the other type of consumer bankruptcy, Chapter 7, cramdowns were never available. Therefore, auto lenders benefited in Chapter 13 relative to Chapter 7, and this caused the impact of the anti-cramdown provision to vary geographically. There are large, persistent historical differences in the usage of Chapter 13 bankruptcy relative to Chapter 7 bankruptcy across states. From 1990 to 2004, the year before BAPCPA, the fraction of total consumer bankruptcies filed under Chapter 13 ranged from 3.5% in North Dakota to 61.1% in Georgia. Moreover, these differences between states are persistent. The coefficient of correlation between states' fraction of bankruptcies under Chapter 13 in 1990 and 2004 is 0.87. Sociological and legal research attributes this variation primarily to "local legal culture," i.e. long-standing differences in how attorneys, trustees, and judges apply the uniform federal bankruptcy law (Braucher, 1993, Sullivan, Warren, and Westbrook, 1994).

We exploit a novel source of geographic variation, persistent differences in Chapter 13 usage across states, in order to identify the impact of the anti-cramdown provision. Our empirical strategy compares changes in auto loan interest rates and quantities in high-13 states, where Chapter 13 is historically common, to changes in low-13 states, where Chapter 13 is historically rare. Specifically, we measure the usage of Chapter 13 by each state's

average share of bankruptcies under Chapter 13 for the four years before BAPCPA, which captures the persistent tendency to file Chapter 13 relative to Chapter 7. We interact this measure with an indicator for the post-BAPCPA period to estimate how changes in auto loans upon BAPCPA vary with states' Chapter 13 usage. While Chapter 13 usage is potentially endogenous, state-level fixed effects hold constant the time-invariant factors in states that generate the variation in Chapter 13 usage. We also use high-frequency data, which allows us to examine changes in auto credit that occur immediately around BAPCPA. Our interest rate data, from a large survey of banks conducted by Bankrate.com, consist of monthly state-level average interest rates on 48-month new car loans. An advantage of the Bankrate.com survey is that interest rates are quoted for an auto loan with fixed characteristics, which allows us to estimate the impact on interest rates, holding other terms of the loan constant. Our data on credit quantity are from the Federal Reserve Bank of New York's Consumer Credit Panel (CCP)/Equifax data, a large, nationally representative, quarterly panel on consumer debts drawn from Equifax credit reports. We construct two measures of credit quantity: the number of new auto loans and the average size of new auto loans. Information on borrowers' Equifax Risk Score in the CCP also allows us to test whether high-risk borrowers were more affected by the law change.

We find that eliminating cramdowns in BAPCPA reduced the interest rate on 48-month auto loans by 15 basis points in the average state. In states in the highest quintile of Chapter 13 usage, interest rates fell by 30 basis points, while in states in the lowest quintile, they fell by 5 basis points. To investigate whether the timing of these changes coincide with BAPCPA, we estimate an event-study specification. The event-study estimates lend credibility to our identification strategy by showing that, prior to BAPCPA, interest rates in high-13 and low-

13 states were trending similarly. That is, changes in interest rates prior to BAPCPA were uncorrelated with historical Chapter 13 usage. Then, in the exact month that BAPCPA went into effect, interest rates fell sharply in states where Chapter 13 was historically more common.

A remaining concern is that BAPCPA introduced several changes to the bankruptcy system in addition to the anti-cramdown provision. BAPCPA increased fees that attorneys charge for filing, implemented a means test that restricts access to Chapter 7 for high-income filers, and reduced the protection of homestead exemptions. We rule out these other channels as possible explanations for the decline in auto loan interest rates. Specifically, our result is robust to controls that allow the impact of BAPCPA to vary with states' average bankruptcy filing rates, exposure to the means test, changes in attorneys' fees, and homestead exemption levels.

Next, we estimate the impact of eliminating cramdowns on the number of new auto loans and the average size of new auto loans. Proponents of the anti-cramdown provision argued that it would lead to increased access to credit, especially for low-income households (MacArthur, 2009). The identification strategy remains the same, but since the CCP contains more detailed geographic variation, we conduct the analysis at the level of the federal court districts. This allows us to use variation in persistent Chapter 13 usage across bankruptcy court districts within a state in addition to the cross-state variation. We find no statistically significant increases in the number or size of new auto loans as a result of eliminating cramdowns. However, it is possible that the impact on the quantity of credit is concentrated on high-risk households, since they are more likely to file for bankruptcy. We find eliminating cramdowns increased the size of new auto loans to subprime borrowers relative to prime

borrowers, though the inclusion of state-specific time trends causes this result to become statistically insignificant.

Our paper contributes to two strands of research. First, it adds to the literature examining the impact of BAPCPA. We provide the first estimates of the causal effect of eliminating cramdowns on auto loan interest rates and credit quantity. Eliminating cramdowns caused a decline in auto loan interest rates, which supports proponents' claims that BAPCPA would lead to more favorable lending terms. Other research has found mixed evidence on the impact of BAPCPA on lending terms for other types of loans. Ang and Jimenez (2014) and Darolia and Ritter (2015) examine the impact of BAPCPA on private student loans and find that, by making these loans non-dischargeable, BAPCPA increased the supply available to high-risk borrowers. But Ang and Jimenez (2014) also find that interest rates on private student loans increased. Another set of papers focus on the negative effects of BAPCPA on consumers in financial distress. Albanesi and Nosal (2015) show that the increased costs of filing for bankruptcy led to fewer bankruptcy filings and increased court judgments and debt in collections. Morgan, Iverson, and Botsch (2012) and Li, White, and Zhu (2011) show that BAPCPA increased sub-prime foreclosures by making it more difficult to discharge unsecured debt in bankruptcy.<sup>2</sup>

Second, our paper contributes to the literature studying how consumer credit markets

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<sup>2</sup>While Morgan, Iverson, and Botsch (2012) focuses on BAPCPA's impact on foreclosures, the longer working paper version also examines the impact of BAPCPA on auto loan interest rates, though they examine a different aspect of BAPCPA than our paper (Morgan, Iverson, and Botsch, 2009). Using the variation in asset exemption levels across states, they find that auto loan interest rates fell more in high-exemption states after BAPCPA. Their estimate captures the effect of aspects of BAPCPA that matter more in high-exemption states. But since high exemptions make it easier to file Chapter 7, and cramdowns are not available in Chapter 7, cramdowns should matter less in high exemption states (all else equal). In contrast, our paper isolates the causal effect of the anti-cramdown provision of BAPCPA using variation in Chapter 13 bankruptcy usage across states. In robustness checks in Section 4.2, we show that our result is robust to including the controls for asset exemption levels (the variation used in Morgan, Iverson, and Botsch (2009)).



respond to bankruptcy laws. Much of the empirical research estimates the impact of asset exemption levels. Gropp, Scholz, and White (1997) show that states with more debtor-friendly asset exemptions have higher interest rates, less credit available to low-asset households, and more loan denials. Other research has found similar effects for small business loans and unsecured credit (Berkowitz and White, 2004, Berger, Cerqueiro, and Penas, 2011, Severino, Brown, and Coates, 2015).<sup>3</sup> Most similar to ours, recent empirical work has found that eliminating mortgage cramdowns in bankruptcy in the 1980s and early 1990s resulted in lower interest rates and small increases in loan approval rates (Goodman and Levitin, 2014, Li, Tewari, and White, 2014). Our paper contributes to this literature by examining a new aspect of bankruptcy law: the elimination of auto loan cramdowns. We also introduce a new source of variation in BAPCPA: persistent differences in local legal culture across states. Persistent variation in local legal culture is important in its own right, and can potentially be used to identify the impact of other changes in federal bankruptcy law.

The rest of the paper is organized as follows. Section 2 discusses the U.S. consumer bankruptcy system. Section 3 gives details about the data and an overview of the empirical strategy. Section 4 presents the results, and Section 5 concludes.

## 2 Consumer Bankruptcy

This section provides an overview of the bankruptcy system and changes made by BAPCPA. In the United States, bankruptcy filers choose between liquidation under Chapter 7 or a repayment plan under Chapter 13. In Chapter 7, the filer’s assets are sold, except for specific

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<sup>3</sup>Research on the effect of exemptions on secured credit and mortgage loans, however, finds conflicting results (Berkowitz and Hynes, 1999, Lin and White, 2001).

assets exempted by state statutes, and the proceeds are given to creditors. In return, most unsecured debts are discharged and the filer is protected from future collection activities. In Chapter 13, the filer does not give up assets, but instead enters a three- to five-year repayment plan. Upon completion of the plan, most remaining unsecured debts are discharged and the filer is protected from future collection activities.

The Chapter 13 repayment plan, which must be approved by the bankruptcy judge, details the payments that the debtor will make to creditors. Typically, secured lenders are repaid the full amount (though at a reduced interest rate), while unsecured creditors receive little (Norberg, 1999).<sup>4</sup> Prior to BAPCPA, one advantage of filing Chapter 13 was that the debtor could cramdown an underwater auto loan (i.e. a loan that is for more than the value of the vehicle). A cramdown splits the loan into two claims: a secured claim equal to the market value of the car and an unsecured claim equal to the remaining balance. For example, if a Chapter 13 filer owed \$15,000 on a car only worth \$10,000, a cramdown would split the loan into a \$10,000 secured claim and a \$5,000 unsecured claim. Since unsecured claims are repaid at a lower rate in a Chapter 13, auto lenders took losses on the underwater portion of the loan. While data on how much auto lenders lost through cramdowns is unavailable, rough estimates of annual losses were in the range of several hundred million to over one billion dollars (Hamburger, 2001, Lundin, 2005). BAPCPA prohibited the cramdown of most auto loans that were less than 910 days old.<sup>5</sup> Now, to retain the vehicle, the debtor must

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<sup>4</sup>As an indication of how much is repaid on unsecured debts, credit card debt in Chapter 13 bankruptcy traded at 10-11 cents on the dollar in 2008 (Levitin, 2010).

<sup>5</sup>Cramdowns are unavailable if the debt meets three requirements: the creditor has a “purchase money security interest” securing the debt (i.e. the loan was used to purchase the vehicle), the debt was incurred within 910 days of the bankruptcy filing, and the collateral is a vehicle acquired for the personal use of the debtor (11 U.S.C. Section 1325(a)). See Whitford (2007) for a more detailed description and Moringiello (2012) for subsequent court rulings on what constitutes “purchase money.”

repay the entire loan as a secured debt. As a result, the anti-cramdown provision increased the payouts to auto lenders in Chapter 13 bankruptcies.

Across states, the fraction of consumer bankruptcies filed under Chapter 13 varies from less than 10% to over 60%. While this variation is partly due to differences in the financial incentives of filers and state laws, research suggests that much of it is due to local legal culture, i.e. the way that attorneys, judges, and trustees in different states apply the uniform federal bankruptcy code (Braucher, 1993, Sullivan, Warren, and Westbrook, 1994, Lefgren and McIntyre, 2009).<sup>6</sup> Braucher (1993) documents how variation in attorneys' incentives, Chapter 13 repayment requirements, and informal practices across bankruptcy districts affect chapter choice. McIntyre, Sullivan, and Summers (2015) provides empirical evidence of the importance of these institutional differences, finding that 5.4% of the cross-sectional variation in Chapter 13 usage can be attributed to differences in the fee that the bankruptcy courts allow lawyers to receive for filing a Chapter 13 bankruptcy. Since cramdowns only affected Chapter 13, the impact of eliminating cramdowns will be larger in states where Chapter 13 is more common.

While varying widely across states, Chapter 13 usage is stable within a state over time. The plots in Figure 1 demonstrate the persistence of each state's Chapter 13 usage. Panel (a) plots each state's fraction of bankruptcies under Chapter 13 in 1990 against the fraction in 2004, the year immediately preceding BAPCPA. The correlation coefficient between the fraction under Chapter 13 in these two years is 0.87, despite bankruptcies per capita almost doubling during this period. Even BAPCPA did not substantially affect states' Chapter 13

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<sup>6</sup>Domowitz and Sartain (1999) examines the role of differences in state exemption laws and individual financial characteristics on bankruptcy chapter choice.

usage.<sup>7</sup> Panel (b) plots the fraction under Chapter 13 in 2004, the year before BAPCPA, against the fraction in 2010, and the points still lie along the 45-degree line. The stability of Chapter 13 usage is essential to our empirical strategy, as it indicates that the determinants of Chapter 13 usage are mostly constant within a state over time, and so can be controlled for with state fixed effects.

In addition to eliminating cramdowns, BAPCPA introduced several other major changes to the bankruptcy system.<sup>8</sup> First, the monetary cost of filing for bankruptcy increased by an average of 25% for Chapter 13 and 38% for Chapter 7 (Lupica, 2012). Second, debtors with incomes over the median income in their state, adjusted for family size, may be prohibited from filing Chapter 7 by the “means test.” Third, BAPCPA attempted to curb abuse of homestead exemptions by limiting the amount that could be exempted on newly purchased homes or by filers who recently moved to a state. Fourth, in determining how much to repay through the Chapter 13 plan, BAPCPA replaced debtor and court discretion with a formula requiring debtors to forfeit all disposable income to creditors (Hildebrand III, 2006). When describing the empirical strategy in Section 3, we discuss how these additional provisions of BAPCPA could affect our results and how we address these concerns.

### 3 Data and Empirical Strategy

The anti-cramdown provision made auto lending more profitable by increasing the amount that lenders receive when a borrower files for Chapter 13 bankruptcy. If lenders are pricing

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<sup>7</sup>Cornwell and Xu (2014) finds that the means test and restrictions on exemptions each increased the Chapter 13 share by 3-4 percentage points.

<sup>8</sup>See White (2007) for a more detailed account of the changes in BAPCPA.

in the risk of cramdowns, the anti-cramdown provision of BAPCPA will cause an increase in the supply of credit and lower interest rates. However, eliminating cramdowns could also increase the costs of holding an underwater car loan, which may reduce demand for auto loans by risk-averse borrowers. To the extent that borrowers' responses affect interest rates (conditional on the borrowers' observable characteristics) and credit quantities, our estimates will reflect the equilibrium response of supply and demand.

We estimate the effect of auto loan cramdowns on three outcomes: auto loan interest rates, the share of borrowers obtaining a new auto loan, and the average size of new auto loans. We hypothesize that the increased supply and possible decreased demand for auto loans will cause interest rates to fall. The predicted direction of the change in quantity, however, is ambiguous. A decrease in demand for auto loans from risk-averse borrowers may offset an increase in credit supply.

### **3.1 Data**

The interest rate data consist of monthly state-level interest rate averages for 48-month new car loans from Bankrate.com. Bankrate.com is a leading aggregator and publisher of personal financial content and continually surveys approximately 4,800 banks and thrifts in all 50 states. The survey asks lenders about interest rates quoted for a \$22,000, 48-month loan to a consumer with a 700 or higher FICO score for the purchase of a new car with a 10% down payment. Therefore, our estimates will reflect the change in interest rates, holding the other loan characteristics fixed. Our data consists of the average interest rate charged in each state based on Bankrate.com's survey for the last day of each month. The institutions included

in the average can differ from day to day depending on which institutions are surveyed. For the main sample, we use a 6-month window around the enactment of BAPCPA (April 2005 - March 2006).

The data on credit quantity are from the Federal Reserve Bank of New York’s Consumer Credit Panel (CCP)/Equifax Data. The CCP dataset is a 5% random sample of all individuals in the U.S. who have an Equifax credit report (see Lee and van der Klaauw (2010) for details on the sample design). The data are based on quarterly credit reports provided by Equifax and are available beginning in 1999Q1. The CCP contains detailed individual-level information on most consumer liabilities (mortgage, HELOC, credit card, student loan, and auto debt), collections, bankruptcies, age of the file holder, an Equifax Risk Score that is similar to the FICO score, and the location of the file holder’s residence down to the Census block.

Due to the large number of observations, we use a 20% random subsample of the CCP data from 2003Q1 to 2007Q4, which constitutes a random 1% sample of all U.S. Equifax credit reports rather than the full random 5% sample.<sup>9</sup> The credit report variables used in our estimation are the number of open auto loans, total auto loan balance, the Equifax Risk Score, and state and county of the file holder’s residence. Since detailed geographic information is available in the CCP, we conduct the analysis at the level of the federal bankruptcy court district rather than the state. There are 89 federal court districts in the 50 states, and each district has its own bankruptcy court.<sup>10</sup> Conducting the analysis at

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<sup>9</sup>Brown et al. (2016) and Albanesi and Nosal (2015), which analyze the impact of state-level variation using the CCP data, also use subsamples of the full 5% random sample available in the Consumer Credit Panel (CCP)/Equifax Data.

<sup>10</sup>Our analysis drops borrowers in the 5 federal court districts in Washington D.C., Guam, Northern Mariana Islands, Puerto Rico, and the Virgin Islands.

the district-level allows us to use variation in Chapter 13 usage across districts within a state as well as the variation across states. We use the county of the file holder’s residence to determine the federal bankruptcy court district in which the borrower would file for bankruptcy. We use two measures of credit quantity aggregated to the district level: the share of borrowers within a district who obtain a new auto loan during each quarter, and the initial balance of the new auto loan. These include loans from banks, credit unions, and auto finance companies.

Our measures of credit quantity are imputed from the number of auto loan accounts and total auto loan balance. To determine new auto loans, we use the algorithm described in Lee et al. (2015). A new auto loan is identified as either a change in the number of auto loan accounts or an increase in the total auto loan balance. We compute the initial balance on the auto loan as the size of the increase in the auto loan balance for those who obtain loans.<sup>11</sup> The CCP does not differentiate between auto loans and leases, so leased vehicles are included in our figures (Brown et al., 2011). Our final sample consists of quarterly averages of the share of borrowers with a new auto loan and the average initial balance on new auto loans for the 89 federal court districts within U.S. states from 2003-2007. We chose the period 2003-2007 to allow for two years of data on before and after the 2005 Bankruptcy Reform, while limiting the influence of the financial crisis in the late 2000s.

In addition, we form a second sample from the CCP/Equifax data consisting of separate auto loan averages for prime and subprime borrowers in each district. We mark an individual as a subprime borrower if he has an Equifax Risk Score less than 620. This sample allows

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<sup>11</sup>We drop the few observations with balance increases over \$100,000 or more than three new auto loans in one quarter. These observations are approximately 0.01% of the sample.

us to investigate whether credit quantities responded differently for high-risk and low-risk borrowers.

The empirical strategy compares changes in states where Chapter 13 is common to changes in states where Chapter 13 is rare. We use annual, state-level counts of Chapter 13 and Chapter 7 non-business bankruptcies published by the Administrative Office of the United States Courts to construct the fraction of bankruptcies filed under Chapter 13 for each state and year. We measure state  $j$ 's Chapter 13 usage,  $Ch.13_j$ , as the average of the annual fraction of bankruptcies under Chapter 13 for the pre-BAPCPA period 2001-2004.<sup>12</sup> We use data from the pre-BAPCPA period 2001-2004 to avoid contaminating the measure with changes in bankruptcy rates caused by BAPCPA. Using annual district-level bankruptcy filings, we construct similar measures of Chapter 13 usage at the district-level for the credit quantity analysis. To control for other factors affecting credit markets, we include the annual log of median income, the log of the home price index from the Federal Housing Finance Agency, and the unemployment rate from the Census Bureau's Local Area Unemployment Statistics.

Table 1 reports the summary statistics for our sample. The mean of our measure of state Chapter 13 usage,  $Ch.13_j$ , is 0.23 and it varies from 0.04 to 0.6. Our main sample of monthly auto loan interest rates is April 2005 to March 2006, and the average interest rate during this period was 6.5%. For the auto loan sample, which consists of quarterly observations from 2003Q1 - 2007Q4, on average, 4.2% of people with a credit report obtained a new auto

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<sup>12</sup>That is,  $Ch.13_j = \sum_{t=2001}^{2004} \frac{Ch.13_{tj}}{4}$ . Another possible measure of Chapter 13 usage would be the average per capita Chapter 13 bankruptcies in the state. We prefer the fraction of bankruptcies under Chapter 13 because it is stable within a state over time while the per capita bankruptcy rate fluctuates with economic and credit market conditions (Dick and Lehnert, 2010, Keys, 2015). The two measures, however, are highly correlated. The correlation coefficient of our chosen measure of Chapter 13 usage,  $Ch.13_j$ , with average Chapter 13 bankruptcies per capita from 2001-2004 is 0.87.



loan each quarter, and the average size of a new loan, measured by the increase in the auto loan balance for those who obtain loans, was \$10,781.

Figure 2 shows the geographic variation in Chapter 13 usage. Many of the states with the highest Chapter 13 filing rates are located in the South. In the empirical analysis, we will address the concern that our estimates are driven by region-specific shocks that affect lending in the South.

## 3.2 Empirical Strategy

Our empirical strategy relies on the fact that the anti-cramdown provision improves auto lenders' outcomes only in Chapter 13 bankruptcy, so its effect will be larger in states where borrowers are more likely to file a Chapter 13 bankruptcy. The main specifications use monthly interest rates from April 2005 to March 2006 to estimate regressions of the form

$$y_{jt} = \alpha + \beta(BAPCPA_t \times Ch.13_j) + X_{jt}\gamma + \delta_j + \tau_t + \epsilon_{jt}, \quad (1)$$

where  $y_{jt}$  is the interest rate on 48-month new car auto loans in state  $j$  in month  $t$ . The effect of eliminating cramdowns is captured by  $\beta$ , the coefficient on  $BAPCPA_t \times Ch.13_j$ .  $BAPCPA_t$  is an indicator function equal to 1 in the post-Reform period, i.e. if  $t \geq$  October 2005. As discussed earlier,  $Ch.13_j$  is the average fraction of bankruptcies filed under Chapter 13 in state  $j$  from 2001-2004. The coefficient  $\beta$  captures the heterogeneous impact of BAPCPA across the distribution of Chapter 13 usage and we attribute this heterogeneity to the impact of eliminating cramdowns.<sup>13</sup>  $X_{jt}$  includes controls for economic conditions within

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<sup>13</sup>In Section 4.2, we relax the assumption that the impact of cramdowns is linear in  $Ch.13_j$  by allowing the effect to vary along the quintiles of the  $Ch.13_j$  distribution. Estimates from these regressions, reported

a state that affect lending markets, namely the log of annual median income, the log of the annual home price index, and the annual state unemployment rate. All regressions include state fixed effects ( $\delta_j$ ) and time fixed effects ( $\tau_t$ ). The error term  $\epsilon_{jt}$  may have a component that is correlated within a state over time, so we cluster errors at the state-level.

A key issue in this identification strategy is that states' Chapter 13 usage is not randomly assigned. For example, it is possible that states with riskier borrowers have both higher interest rates on auto credit and greater usage of Chapter 13 bankruptcy. The state fixed effects control for time-invariant differences between states that affect auto loan interest rates. These time-invariant characteristics include the persistent local legal culture, population characteristics, and fixed credit market characteristics.

Conditioning on state fixed effects, identification relies on the parallel trends assumption: if cramdowns were not eliminated, auto loan interest rates in high-13 and low-13 states would have followed parallel trends. That is, if cramdowns were not eliminated, changes in auto loan interest rates would not be correlated with historical Chapter 13 usage. This assumption would be violated if there are unobserved time-varying differences across states that are correlated with both Chapter 13 usage and auto loan interest rates. For example, we may worry that Chapter 13 usage is high in states where interest rates are trending downward. In this scenario, our estimates would attribute these falling interest rates to the elimination of cramdowns.

We address concerns about unobserved time-varying differences across states in two ways. First, we allow the time fixed effects to vary across the four U.S. Census regions and state-specific linear trends. By isolating variation in Chapter 13 usage within a Census region, the in Table 4, suggest that a linear effect of  $Ch.13_j$  provides a good approximation.

region-specific time fixed effects address the concern that many of the states with historically high shares of bankruptcies under Chapter 13 are clustered in the South. If our results were driven by a region specific shock to that caused interest rates to fall in the South, these shocks would be capture by the region-specific time fixed effects.

Second, we show that, prior to BAPCPA, changes in interest rates were uncorrelated with Chapter 13 usage. To do this, we estimate an event study specification to examine the timing of changes in interest rates along the distribution of Chapter 13 usage. We expand the sample to 2004-2007 and estimate a regression that interacts Chapter 13 usage with the full set of time fixed effects:

$$r_{jt} = \alpha + \sum_{k=2004m2}^{2007m12} \beta_k \mathbb{1}(t = k) \times Ch.13_j + X_{jt}\gamma + \delta_j + \tau_t + \epsilon_{jt} \quad (2)$$

$\beta_k$  captures the correlation between interest rates and Chapter 13 usage in month  $k$  relative to the omitted month, January 2004, after partialling out state fixed effects, month fixed effects, and the economic controls.<sup>14</sup> This specification allows us to observe the timing of changes in auto loan interest rates. If states changes in interest rates are uncorrelated with Chapter 13 usage, the estimates of  $\beta_k$  will be (economically and statistically) zero for the months prior to BAPCPA. In addition to lending credibility to the identification assumption, this specification allows us to observe how the impact of eliminating cramdowns varies over time. The estimates of  $\beta_k$  for the months after BAPCPA reflect how the impact of cramdowns on interest rates changed over time.

The event-study specification tests whether the period before BAPCPA is consistent with

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<sup>14</sup>We omit January 2004 as it is the first month in this sample and reflects auto loan interest rates in states 1.5 years prior to the enactment of BAPCPA.

the identification assumption (of similar pre-trends), whether interest rates changed around BAPCPA, and whether the timing of these changes coincides with the precise timing of BAPCPA. Even if pre-BAPCPA changes in interest rates are uncorrelated with Chapter 13 usage and the timing of interest rate changes coincides with BAPCPA, the changes in interest rates still may not be caused by eliminating cramdowns. BAPCPA introduced many changes to bankruptcy law in addition to the anti-cramdown provision. The time fixed effects capture the aspects of BAPCPA that uniformly affect all states. However, if the impact of other provisions of BAPCPA is correlated with Chapter 13 usage,  $\beta$  would capture the net effect of these provisions and cramdowns. We rule out this concern by including controls for geographic variation in the other main aspects of BAPCPA: changes in the cost of filing, the means test, and restrictions on homestead exemptions. To control for these other provisions, we interact the post-BAPCPA indicator with bankruptcies per capita, changes in attorney fees, exposure to the means test, and asset exemption levels.

Next, we estimate the effect of cramdowns on two measures of the quantity of auto credit: the share of borrowers obtaining a new loan and the average size of new loans. The empirical strategy remains the same as in the interest rate regressions, but there are two changes to the structure of the data. First, while the interest rate data are monthly, the data on the quantity of auto credit are quarterly. Second, since the CCP contains a finer level of geography, we conduct the analysis at the level of the federal court district. This allows us to take advantage of variation in Chapter 13 usage across districts within the same state, as well as the cross-state variation in Chapter 13 usage. The credit quantity sample consists of quarterly observations for the 89 federal court districts from 2003 to 2007. For federal court

district  $d$  in quarter  $t$ , the regression takes the following form

$$y_{dt} = \alpha + \beta(BAPCPA_t \times Ch.13_d) + X_{dt}\gamma + \delta_d + \tau_t + \epsilon_{dt}. \quad (3)$$

The measure of credit supply,  $y_{dt}$ , is either the share of borrowers obtaining a new auto loan or the mean size of new auto loans for district  $d$  during quarter  $t$ .  $BAPCPA_t$  is an indicator variable equal to one if  $t \geq 2005Q4$ , and  $Ch.13_d$  is the average fraction of bankruptcies under Chapter 13 from 2001-2004 in district  $d$ .  $X_{dt}$  includes annual district-level controls for the log of median income and the unemployment rate, and annual state-level controls for the log of the home price index. We also include district and time fixed effects. Standard errors are clustered at the state-level to allow for serial correlation across districts within a state and within a district over time. To correct for heteroskedasticity caused by differences in the number of borrowers across districts, we weight the district averages by the number of individual observations for that district and quarter in the CCP.

Since changes in bankruptcy law are more likely to affect high-risk borrowers, we also estimate regressions that allow the effect to differ for prime and subprime borrowers. For subprime status  $s$  ( $s=1$  if subprime, 0 if prime), district  $d$ , and quarter  $t$ , these regressions take the form

$$\begin{aligned} y_{sdt} = & \alpha + \beta_p(BAPCPA_t \times Ch.13_d) + \beta_s(BAPCPA_t \times Ch.13_d \times \mathbb{1}\{s=1\}) \\ & + X_{dt}\gamma + \kappa\mathbb{1}\{s=1\} + \delta_{sd} + \tau_{st} + \epsilon_{sdt}. \end{aligned} \quad (4)$$

By interacting subprime status with state and year fixed effects, this specification can be

viewed as a triple-difference, comparing changes around BAPCPA, across Chapter 13 usage, and between subprime and prime borrowers. We weight the observations by the number of individual observations in each district-quarter-subprime cell.

## 4 Results

### 4.1 Interest Rates for New Car Loans

Figure 3 provides graphical evidence that the anti-cramdown provision caused auto loan interest rates to fall in states with a higher share of bankruptcies under Chapter 13. The figure plots the difference between each state’s pre- and post-BAPCPA auto loan interest rate spread against Chapter 13 usage. The spread is the difference between the 48-month auto loan interest rate and the interest rate on five-year Treasury bills, and so controls for the national credit conditions in the pre- and post-BAPCPA periods. Consistent with the anti-cramdown provision reducing the price of auto credit, interest rate spreads on auto loans fell, and this decline is larger in states with greater Chapter 13 usage.

Table 2 reports estimates of this decline from the baseline specification in equation (1). All specifications show a similar and statistically significant decline in auto loan interest rates in states with greater Chapter 13 usage. The coefficient of -65.5 in column 1 implies that interest rates fell by an additional 6.55 basis points for every 10 percentage points in the historical fraction of bankruptcies under Chapter 13. The estimate in column 1 implies that interest rates fell by 30 basis points for states in the top quintile in Chapter 13 usage and by 5 basis points for states in the bottom quintile.<sup>15</sup>

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<sup>15</sup>These magnitudes are obtained by multiplying the coefficient in column 1, 65.5, by the mean Chapter

Columns 2-5 add controls for economic conditions and specific forms of unobserved spatial heterogeneity. Column 2 adds state-level controls for monthly unemployment rates, the log of annual median income, and the log of the annual home price index. The estimated effect is unchanged. One concern with the identification strategy is that many of the states with the highest share of Chapter 13 bankruptcies are clustered in the South. If interest rates in the South were falling relative to other regions, we would falsely attribute that to the impact of the anti-cramdown provision. Column 3 addresses this concern by including region-specific time fixed effects for the four Census regions, which identifies the impact of cramdowns entirely from variation in Chapter 13 usage within each region. Even with the inclusion of these region-specific controls, there is little change in the estimated effect. Column 4 adds controls for state-specific linear time trends, and the estimates remain similar. To interpret the magnitude of the effect in the average state, the bottom row multiplies the coefficient by the average Chapter 13 filing rate in our sample, 23%. Using this measure, the elimination of cramdowns caused interest rates to fall by 12.7-15.9 basis points in the average state.

Next, we turn to the event study regressions that examine the timing of these changes in interest rates. Figure 4 plots the coefficients of Chapter 13 usage interacted with the full set of month indicators from February 2004 to December 2007 (see equation (2)).<sup>16</sup> Prior to BAPCPA, the coefficients are small and statistically insignificant, indicating that changes in interest rates were uncorrelated with Chapter 13 usage throughout 2004. Between April 2005 and October 2005, when BAPCPA had been signed into law but had not yet gone into effect, interest rates began to fall in higher Chapter 13 states relative to lower Chapter

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13 among states in the top (47%) and bottom (7%) quintiles of Chapter 13 usage.

<sup>16</sup>Table A1 reports the coefficients and standard errors from a similar regression that, to reduce the size of the Table, groups the interactions into two-month intervals.

13 states, reflected by the negative point coefficient estimates. This decline may reflect anticipation by lenders if they began reducing interest rates prior to when the law went into effect. In October 2005, the month that BAPCPA went into effect, the coefficient on the interaction fell sharply. This drop indicates that, beginning in October 2005, auto loan interest rates experienced a relative decline in states where Chapter 13 is historically more common. That the drop occurs in October 2005 also shows that our result is not due to the large sales by General Motors, Chrysler, and Ford, which peaked in June and July 2005 (Busse, Simester, and Zettelmeyer, 2010). The longer-run impact dissipated somewhat over time; the coefficient for October-November 2007, reported in Appendix Table A1, is  $-56.5$  and significant at the 10% level. Overall, the results of this section show that auto loan interest rates experienced a relative decline in states with greater Chapter 13 usage, and the largest decline occurred at the exact time that BAPCPA went into effect.

## 4.2 Other BAPCPA Provisions and Alternative Specifications

The next set of results rules out alternative explanations for the decline in interest rates and investigates sensitivity to functional form. While the event study analysis shows that the largest change in interest rates coincides with the timing of BAPCPA, it might have been caused by provisions of BAPCPA other than the elimination of cramdowns. Table 3 investigates this possibility by including interactions of the BAPCPA indicator with additional state characteristics that cause the impact of the other main aspects of BAPCPA to vary geographically.

Column 1 reproduces the baseline specification with economic controls from Table 2. One



competing explanation for our result is that areas with a high Chapter 13 usage also tend to file more bankruptcies (Lefgren and McIntyre, 2009). If BAPCPA simply had a larger impact on interest rates in states with more bankruptcies, it could bias our estimates. Column 2 rules out this explanation by including the interaction of  $BAPCPA_t$  with the average per capita bankruptcy filing rate (Chapter 7 plus Chapter 13) in each state from 2001-2004. Our estimated effect of cramdowns remains significant and actually increases in magnitude.

Research suggests three additional sources of geographic variation in the impact of BAPCPA: the cost of filing, the means test, and homestead exemptions. First, BAPCPA increased attorney fees, and the amount varied across states (Lupica, 2012, Albanesi and Nosal, 2015). Second, BAPCPA's means test affected some states more than others. Third, BAPCPA restricted the use of homestead exemptions, which may cause the impact of BAPCPA to be larger in states with more lenient exemptions (Morgan, Iverson, and Botsch, 2012, Cornwell and Xu, 2014).

Columns 3-6 interact the BAPCPA indicator with state-level characteristics that address each of these concerns. Column 3 interacts the BAPCPA indicator with each state's change in Chapter 7 attorney's fees as reported in Lupica (2012). Column 4 interacts it with an indicator that equals one for the 8 states that Cornwell and Xu (2014) report are most affected by the means test.<sup>17</sup> Column 5 interacts the BAPCPA indicator with states' homestead exemption levels, as in the identification strategy of Morgan, Iverson, and Botsch (2012).<sup>18</sup>

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<sup>17</sup>These states are California, Florida, Louisiana, Mississippi, New Mexico, New York, Oregon, and Texas. The means test applies to individuals with income above the median income in their state after adjustments for family size. Cornwell and Xu (2014) argue that these 8 states are most affected by the means test because they have the largest share of the population with incomes between the median and mean of state income.

<sup>18</sup>States' exemptions are coded as the level of the homestead in 2005 (in \$10,000s) with a dummy indicator for the states with an unlimited homestead exemption.

Finally, column 6 includes all of the additional interactions in one regression.<sup>19</sup> In all of these regressions, the estimated effect of cramdowns remains negative and significant, indicating that our main estimates are not biased by geographic variation in the other main aspects of BAPCPA. A final concern is that the passage of BAPCPA coincided with Hurricanes Katrina and Rita, which hit in August and September 2005 and affected mostly states with a high share of Chapter 13 bankruptcies. Column 7 drops the states most affected by the hurricanes: Alabama, Florida, Louisiana, Mississippi, and Texas. The estimated effect of cramdowns remains largely unchanged.

In another set of regressions, we investigate the sensitivity of our result to changes in the functional form. The specification in equation (1) assumes that the impact on interest rates is linear in  $Ch.13_j$ . Table 4 shows that linearity is a good approximation by comparing the results from the linear specification to a more flexible model that interacts the post-BAPCPA indicator with an indicator for each quintile of the  $Ch.13_j$  distribution. Column 1 reports the baseline specification. Columns 2-5 show the change in interest rates for each Chapter 13 quintile, varying the set of controls for spatial heterogeneity. To compare the magnitudes implied by the baseline specification to the more flexible quintile model, the bottom row reports the predicted change in interest rates caused by moving from the first to fifth quintile. The baseline linear specification predicts that interest rates fall by 27.6

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<sup>19</sup>We do not estimate a regression for the fourth main provision discussed in Section 2, which mandated that borrowers forfeit all disposable income in Chapter 13, but it is unlikely to be driving our results. For this research, the concern would be that this new method of calculating payments caused the amount repaid in Chapter 13 to increase, so auto lenders would benefit more in states where Chapter 13 is common. However, in many cases the new method for calculating repayment requires debtors to pay less than they would have paid before BAPCPA (Hildebrand III, 2006, Drobish, 2007). Indeed, Lupica (2013) finds that distributions to unsecured creditors in Chapter 13 fell after BAPCPA. This suggests that the provision was not effective in increasing the amount of money repaid to creditors in Chapter 13, and so would not cause auto lenders to reduce interest rates in states with more Chapter 13 bankruptcies.

basis points for states in the fifth quintile relative to states in the first quintile.<sup>20</sup> The quintile models in columns 2-5 predict that interest rates fall by 20.2-23.4 basis points. The similarity of these magnitudes suggests that linearity in Chapter 13 usage provides a good fit for estimating the impact of eliminating cramdowns.

### 4.3 Credit Supply

Next, we estimate the effect of eliminating cramdowns on two measures of credit quantity: the share of borrowers obtaining new auto loans and the mean size of the new loans, conditional on borrowing. Table 5 reports estimates of the effect on the quantity of credit. Columns 1-3 show that there is a small, negative, and statistically insignificant impact on the share of borrowers obtaining a new loan. Evaluated at the mean Chapter 13 filing rate, the point estimate in column 1 implies that auto loan originations fell by 1 loan per 10,000 borrowers. The point estimates remain negative and insignificant when adding additional controls for economic conditions and state trends. Columns 4-6 show that the impact on the average size of new auto loans is positive, but also statistically insignificant. Evaluated at the mean Chapter 13 filing rate, the point estimate in Column 4 implies that the initial auto loan balances increased by \$97. In Column 6, when controls for economic conditions and district-level linear time trends are included, the estimated effect of cramdowns is positive and statistically significant at the 10% level.

It is possible, however, that changes in credit supply resulting from the anti-cramdown provision were concentrated among high-risk borrowers, since they are more likely to file for

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<sup>20</sup>Quintile 1 has a mean Chapter 13 ratio of 0.07 and quintile 5 has a mean Chapter 13 ratio of 0.47. The baseline specification predicts that a 0.4 increase in the Chapter 13 ratio reduces interest rates by an additional  $0.4 * 68.9 = 27.6$  basis points.

bankruptcy. Table 6 reports the estimates from the specification that allows the effect to vary across prime and subprime borrowers. The coefficient on  $BAPCPA \times Ch.13$  captures the effect on prime borrowers, while the coefficient on  $BAPCPA \times Ch.13 \times subprime$  captures the difference between the effect on subprime borrowers relative to the effect on prime borrowers. Columns 1-3 show that, for both prime and subprime borrowers, the estimated effect on the number of auto loans remains negative, and statistically insignificant. In columns 4-6, however, the estimates show an increase in loan sizes for subprime borrowers relative to prime borrowers. Evaluated at the mean Chapter 13 usage of 23%, the coefficient of 616.4 in column 4 implies that eliminating cramdowns increases the size of new subprime loans by \$142 relative to new prime loans. The estimate remains significant when controls for economic conditions are included in column 5. In column 6, the estimate becomes insignificant when state-by-subprime-status linear trends are included, though the point estimate increases in magnitude. These estimates provide some evidence that the anti-cramdown provision increased the size of new auto loans among subprime borrowers.

## 5 Conclusion

BAPCPA decreased the relief provided to bankruptcy filers by restricting access to bankruptcy and reducing its benefits. Proponents of BAPCPA argued that these restrictions would lead to cheaper consumer credit. In this paper, we investigate whether one of the main provisions of BAPCPA, the elimination of auto loan cramdowns in Chapter 13, reduced the price of auto loans and increased the quantity of credit. Using a new identification strategy based on persistent variation in states' use of Chapter 13 over Chapter 7,

we provide the first estimates of the causal impact of eliminating cramdowns on auto credit markets.

We find that the anti-cramdown provision reduced auto loan interest rates by an average of 15 basis points, with larger declines in states with a historically higher share of bankruptcies under Chapter 13. We show that this decline occurred in the month that BAPCPA went into effect, and rule out the other major provision of BAPCPA as potential causes. Over a typical 48-month auto loan, a 15 basis point reduction translates into a 0.3% reduction in the monthly payment or a \$73 reduction in total loan payments for a \$22,000 loan.<sup>21</sup> Relative to the frequency of Chapter 13 bankruptcies, a 15 basis point reduction in interest rates is sizable. Estimates from the CCP/Equifax data indicate that only 0.8-1% of pre-BAPCPA auto loan borrowers would have been affected by the elimination of cramdowns in Chapter 13.<sup>22</sup> We also find some evidence that eliminating cramdowns also increased the size of auto loans, particularly among subprime borrowers. These findings support proponents' claims that BAPCPA would lead to cheaper credit.

Eliminating cramdowns may also have changed other dimensions of auto loan contracts. An important feature of auto loans missing from our analysis is the effect on the loan term. Auto loan terms have increased over the last decade and, in 2015, 69% of new car loans had a term greater than 60 months (Zabritski, 2015). It is possible that prohibiting cramdowns contributed to this trend by increasing the profitability of longer loans, since longer loans

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<sup>21</sup>The monthly payment on a 48-month auto loan is given by the formula  $P \times \frac{r}{12} (1 + \frac{r}{12})^{48} / ((1 + \frac{r}{12})^{48} - 1)$ . Reducing the interest rate from  $r = 0.065$  to  $r = 0.0635$  results in a 0.3% reduction in the monthly payment. For a  $P = \$22,000$ , this translates into a \$73 reduction in the total amount paid.

<sup>22</sup>The anti-cramdown provision eliminates cramdowns during the first 910 days of an auto loan. Using the CCP/Equifax data, we follow the cohorts of new auto loans originated in 2000-2004. For these five years, the share of these borrowers that file Chapter 13 within the first 910 days (10 quarters) ranges between 0.8% and 1%.

are more likely to become underwater.

Overall, we find that BAPCPA’s anti-cramdown provision resulted in a significant decline in auto loan interest rates. Our results also demonstrate how differences in regional bankruptcy practices can alter the impact of a uniform federal law change. Although BAPCPA prohibited cramdowns in all states, the impact of this change varied due to geographic differences in local legal culture that influence whether borrowers file Chapter 13 or Chapter 7. We find that interest rates fell by 30 basis points for states in the highest quintile of Chapter 13 usage, but only by 5 basis points for states in the lowest quintile. More generally, this paper shows that differences in local legal culture can alter the impact of uniform federal law changes.

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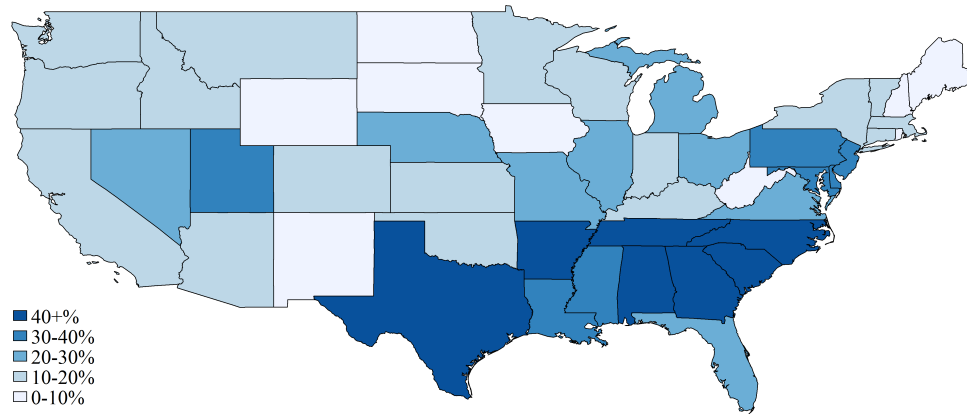


Figure 2: **Fraction of Bankruptcies under Chapter 13** This figure shows the geographic variation in the average fraction of bankruptcies filed under Chapter 13 from 2001-2004. Source: Administrative Office of the U.S. Courts

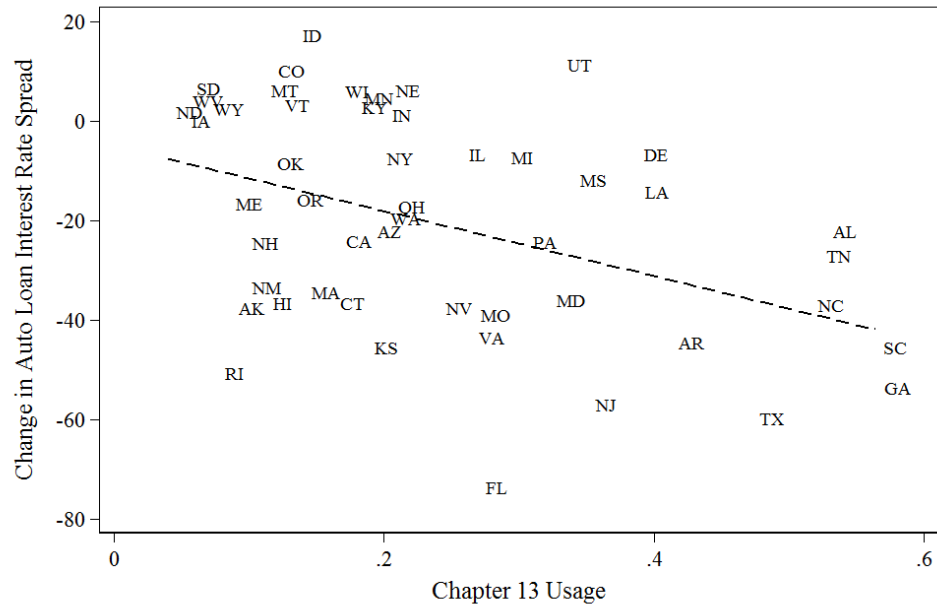


Figure 3: **Auto Interest Rates and Chapter 13 Usage** This figure plots each state's change in average interest rate spreads on 48-month new car auto loans from the 6 months before BAPCPA (April-September 2005) to the 6 months after BAPCPA (October 2005-March 2006) against state Chapter 13 usage. The spread is difference between the interest rates on 48-month auto loans and the five-year Treasury bill. Chapter 13 usage is a state's average fraction of bankruptcies under Chapter 13 for the years 2001-2004. Source: Bankrate.com, FRB Table H.15, and Administrative Office of the U.S. Courts.

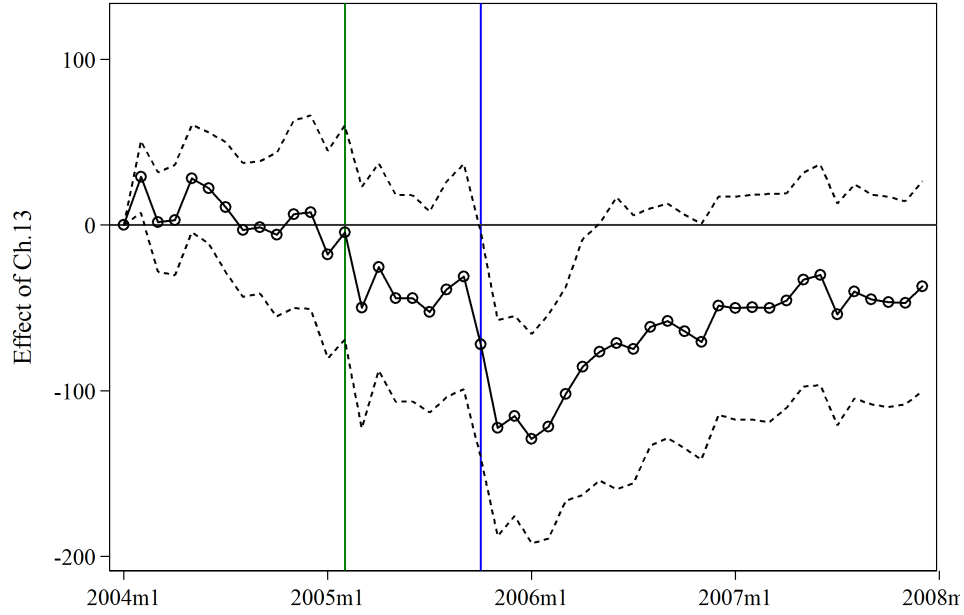


Figure 4: **Timing of Interest Rate Changes** This figure plots the  $\beta_k$  coefficients and 95% confidence intervals from standard errors clustered at the state-level. The vertical green line is February 2005, when BAPCPA was introduced in the Senate. BAPCPA passed the Senate in March 2005, and passed the House and was signed into law in April 2005. The vertical blue line is October 2005, the month that BAPCPA went into effect.

Table 1: Summary Statistics

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>	<b>Obs</b>
fraction under Ch.13	0.23	0.15	0.04	0.6	50
Ch.13 per thousand	1.36	1.22	0.13	5.52	50
new car loan interest rate (bp)	650	43	525	793	600
share with new auto loan	.042	.011	.018	.090	1780
auto loan initial balance	10,781	1,367	6,392	14,849	1780

Sources: Data on bankruptcies are from the Administrative Office of the U.S. Courts. The fraction under Chapter 13 and Chapter 13 bankruptcies per thousand are at the state-level and averaged from 2001-2004. Interest rates are Bankrate.com's monthly state-level averages from April 2005 to March 2006. The share with a new auto loan and initial balance on the auto loan are from the FRBNY Consumer Credit Panel/Equifax Data, and the table presents the average of quarterly observations of the 89 federal court districts (excluding DC, GU, NMI, PR, VI) from 2003-2007, weighted by the number of observations within each district.

Table 2: The Effect of Cramdowns on Auto Loan Interest Rates

	Dependent variable: 48-month new car interest rate			
	(1)	(2)	(3)	(4)
$BAPCPA \times Ch.13$	-65.5*** (17.0)	-68.9*** (15.9)	-63.5*** (23.4)	-55.1** (21.8)
Observations	600	600	600	600
R-squared	0.840	0.843	0.867	0.893
State economic controls		X	X	X
Region-time FE			X	
State linear trends				X
Magnitude at mean	-15.1	-15.9	-14.6	-12.7

Data are monthly state-level observations of average 48-month new car interest rates from April 2005 to March 2006. Standard errors clustered at the state-level are in parentheses. All regressions include state and time fixed effects.  $BAPCPA_t$  is an indicator that equals 1 for months after October 2005. Column 2 adds state-level controls for monthly unemployment rates, and annual log of median income and log of the home price index. Column 3 adds region $\times$ time fixed effects. Column 4 adds controls for linear state-specific time trends. The magnitude at mean shows the coefficient of  $BAPCPA_t \times Ch.13_j$  multiplied by the mean Chapter 13 filing rate of 0.23. Significance levels: \*10%, \*\*5%, \*\*\*1%.



Table 3: Robustness to Controls for Other BAPCPA Provisions

	Dependent variable: 48-month new car interest rate						
	Baseline (1)	Bank. Rate (2)	Fees (3)	Means Test (4)	Exemptions (5)	Combined (6)	Katrina (7)
BAPCPA $\times$ <i>Ch.13</i>	-68.9*** (15.9)	-92.0*** (16.7)	-72.3*** (18.6)	-66.7*** (15.0)	-79.5*** (15.6)	-97.5*** (14.9)	-64.6*** (16.8)
BAPCPA $\times$ bankruptcy rate		3.61** (1.43)				3.29** (1.40)	
BAPCPA $\times$ fee change			-0.014 (0.023)			0.0029 (0.022)	
BAPCPA $\times$ means test				-11.4 (8.20)		-8.50 (7.06)	
BAPCPA $\times$ exemption					-0.62*** (0.19)	-0.59*** (0.22)	
BAPCPA $\times$ unlimited					-18.0** (8.79)	-16.5** (7.85)	
Observations	600	600	600	600	600	600	540

Data are monthly state-level observations from April 2005 to March 2006. Standard errors clustered at the state-level are in parentheses.  $BAPCPA_t$  is an indicator that equals 1 for months after October 2005. All regressions include state-level controls for monthly unemployment rates, the annual log of median income, the log of the home price index, and state and time fixed effects. Column 1 is the baseline specification. Columns 2-5 add an interaction  $BAPCPA_t \times$  with state-level measures bankruptcies per thousand people (mean rate from 2001-2004), the change in Chapter 7 attorney fees around BAPCPA, exposure to the means test, and 2005 asset exemptions (in \$10,000). Column 6 includes all interactions terms together. Column 7 drops the states most affected by Hurricanes Katrina and Rita: AL, FL, LA, MS, TX. Significance levels: \*10%, \*\*5%, \*\*\*1%.

Table 4: Investigating Functional Form

	Dependent variable: 48-month new car interest rate				
	(1)	(2)	(3)	(4)	(5)
Ch.13 quintile 2		5.90 (9.40)	6.93 (9.70)	9.29 (8.51)	-1.19 (9.98)
Ch.13 quintile 3		2.68 (8.52)	3.75 (8.35)	-0.77 (7.67)	-1.56 (6.48)
Ch.13 quintile 4		-12.1 (10.2)	-11.4 (9.77)	-13.8 (9.26)	-9.14 (8.57)
Ch.13 quintile 5		-22.0** (8.90)	-23.4*** (8.40)	-21.9** (10.1)	-20.2* (11.1)
BAPCPA $\times$ Ch.13	-68.9*** (15.9)				
Observations	600	600	600	600	600
State economic controls	X		X	X	X
Region-time FE				X	
State linear trends					X
Change Q5-Q1	-27.6	-22	-23.4	-21.9	-20.2

Data are monthly state-level observations from April 2005 to March 2006. Standard errors clustered at the state-level are in parentheses. All regressions include state and time fixed effects. Column 1 is the baseline specification. Columns 2-5 relax the assumption that the effect is linear in  $Ch.13_j$  by interacting the BAPCPA indicator with dummies for quintiles of  $Ch.13_j$ . The omitted group is the first quintile. Significance levels: \*10%, \*\*5%, \*\*\*1%.

Table 5: Auto Loans

Dependent variable:	New Auto Loans Per 100			Initial Auto Loan Balance		
	(1)	(2)	(3)	(4)	(5)	(6)
BAPCPA $\times$ Ch.13	-0.0349 (0.242)	-0.0815 (0.216)	-0.321 (0.414)	419.8 (395.8)	612.0 (375.1)	920.7* (504.2)
District & time FE	X	X	X	X	X	X
Economic conditions		X	X		X	X
District Trends			X			X
Observations	1,780	1,780	1,780	1,780	1,780	1,780
Mean of Dep. Var.	4.2	4.2	4.2	10,781	10,781	10,781
Magnitude at Mean	-0.01	-0.02	-0.07	96.55	140.76	211.76

The dependent variables are quarterly, district-level averages from 2003Q1 to 2007Q4 weighted by the number of individual observations in the FRBNY CCP for each district-year. Standard errors clustered by state are in parentheses. Economic controls consist of district-level controls for the unemployment rate and the log of the median income, and the log of the state home price index. The magnitude at mean shows the coefficient of  $BAPCPA_t \times Ch.13_j$  multiplied by the mean Chapter 13 filing rate of 0.23. Significance levels: \*10%, \*\*5%, \*\*\*1%.

Table 6: Auto Loans by Risk Category

Dependent variable:	New Auto Loans Per 100			Initial Auto Loan Balance		
	(1)	(2)	(3)	(4)	(5)	(6)
BAPCPA $\times$ <i>Ch.13</i>	-0.204 (0.274)	-0.239 (0.263)	-0.0928 (0.353)	128.5 (428.6)	297.5 (379.2)	329.3 (419.1)
BAPCPA $\times$ <i>Ch.13</i> $\times$ subprime	-0.103 (0.246)	-0.118 (0.243)	-0.829 (0.607)	616.4* (317.3)	698.4** (311.4)	920.6 (629.8)
District $\times$ subprime FE	X	X	X	X	X	X
Time $\times$ subprime FE	X	X	X	X	X	X
Economic conditions		X	X		X	X
District $\times$ subprime Trends			X			X
Observations	3,560	3,560	3,560	3,560	3,560	3,560

The dependent variables are quarterly averages for prime borrowers or subprime borrowers in each district. The data are from 2003Q1 to 2007Q4 and are weighted by the number of individual observations in the FRBNY CCP for each district-year-subprime cell. Standard errors clustered by state are in parentheses. Economic controls consist of district-level controls for the unemployment rate and the log of the median income, and the log of the state home price index. Significance levels: \*10%, \*\*5%, \*\*\*1%

Table A1: Interest Rates - Event Study

2-month interaction	Interest Rate on 48-Month Auto Loan (in Basis Points)			
	2004-2007 (1)	(2)	2005m4-2006m4 (3)	(4)
2004.3	-12.6 (14.7)	-12.1 (14.5)		
2004.5	4.67 (17.7)	10.6 (16.8)		
2004.7	-18.9 (21.3)	-10.6 (21.1)		
2004.9	-25.9 (23.1)	-18.2 (22.7)		
2004.11	-13.4 (30.6)	-7.41 (30.1)		
2005.1	-33.5 (34.0)	-25.7 (32.9)		
2005.3	-58.4 (34.9)	-52.1 (33.2)		
2005.5	-69.7** (33.4)	-58.8* (32.2)	-22.8** (11.1)	-25.2** (9.78)
2005.7	-72.6** (33.7)	-60.2* (32.2)	-25.7 (15.4)	-29.0* (14.6)
2005.9	-82.2** (36.7)	-66.1* (34.3)	-35.3* (21.0)	-40.9* (21.6)
2005.11	-146*** (33.2)	-133*** (32.5)	-98.9*** (20.6)	-102*** (21.1)
2006.1	-139*** (37.0)	-140*** (34.7)	-92.3*** (21.6)	-102*** (21.4)
2006.3	-107*** (39.4)	-108*** (37.1)	-67.0*** (22.4)	-75.1*** (21.9)
2006.5	-91.8** (44.9)	-88.5** (43.6)		
2006.7	-88.2** (40.7)	-82.8** (40.2)		
2006.9	-78.6** (38.7)	-75.6** (37.4)		
2006.11	-74.7** (37.1)	-74.1** (35.8)		
2007.1	-60.6 (36.8)	-64.5* (35.5)		
2007.3	-56.8 (36.1)	-62.4* (34.9)		
2007.5	-45.1 (33.7)	-46.0 (34.2)		
2007.7	-63.2* (32.6)	-61.6* (34.1)		
2007.9	-61.2* (31.5)	-60.3* (32.9)		
2007.11	-56.1* (31.3)	-56.5* (32.2)		
Obserations	2,400	2,400	600	600
Economic Controls		X		X

Data are monthly state-level observations of the states' average 48-month new car interest rates from Bankrate.com. Columns 1 and 2 use data from 2004m1-2007m12. Columns 3-4 use data from 2005m4-2006m3. The table presents the coefficients of  $Ch_{13j}$  interacted with monthly indicators (grouped into 2-month bins). Standard errors clustered at the state-level are in parentheses. All specifications include state and time fixed effects. State-level economic controls are for monthly unemployment rates, the annual log of median income, the log of the home price index, and state and month-year fixed effects. Significance levels: \*10%, \*\*5%, \*\*\*1%.