Personal Bankruptcy Protection and Household Debt

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Abstract

Personal bankruptcy laws provide defaulters with partial protection of assets from unsecured creditors. Increasing bankruptcy protection can increase credit demand through improved risk sharing, especially from risk averse borrowers, while diminishing the collateral value of assets and reducing borrowers' access to credit. Using changes in bankruptcy protection across US states over time, we show that these laws increase borrowers' holdings of unsecured credit, but not secured debt (mortgage and auto loans). We also find an increased interest rate for unsecured credit only. These effects are predominantly driven by lower-income higher home ownership areas (where increased bankruptcy protection explains 10% to 30% of unsecured debt growth). Using individual data, we find on average no measurable increase in delinquency rates of households in the subsequent three years, an effect mainly explained by homeowners' increasing debt without defaulting. These results suggest that increased bankruptcy protections did not reduce the aggregate level of household debt, but affected the composition of borrowing.

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1 Introduction

The last two decades in the US have seen a massive increase in household leverage, from 320 billion dollars in 1994 to 1060 billion dollars in 2010, and at the same time an increase in personal bankruptcies, which peaked in 2005 with 2.04 million filings.[1] These trends have brought renewed attention from academics and policy makers on the role that bankruptcy rules play in helping people manage their debt load, but also the incentives they provide to take on leverage in the first place.

Personal bankruptcy laws in the US protect a fraction of a household's assets from seizure by unsecured creditors; under Chapter 7 bankruptcy, households are protected from creditors up to a monetary limit set by each state – the personal bankruptcy exemption. An increase in the level of this exemption (referred to as protection henceforth) may strengthen the demand for credit but can also decrease the supply of credit. In case of default, the lender cannot seize the borrower's assets if their value does not exceed the protection level dictated by law, while if they do the lender can only seize the excess value. Consider any simple model of a credit market with financially constrained, risk-averse borrowers, and a risk-neutral lender. If borrowers have a stochastic income, increased bankruptcy protection makes defaulting attractive to borrowers in more states of the world. As a result it diminishes the collateral value of assets, forcing lenders to charge a higher interest rate ex ante to break even (Hart and Moore, 1994). Therefore, this is akin to reducing the supply of credit, increasing prices, and/or reducing quantities. In addition, such a change in the supply of credit could increase the riskiness of the pool of loan applicants; increases in lending rates might foster borrowers' incentives to undertake riskier projects, or could intensify the entry of riskier borrowers (Stiglitz and Weiss, 1981)[2].

Most of the existing empirical literature has focused on the effects described above that tend to reduce the supply of credit (the seminal paper in the area is Gropp et al., 1997). However, a higher protection level will also improve risk-sharing by increasing the insurance function of bankruptcy: in bad states of the world the borrower declares bankruptcy and, as a result of the higher protection level, is allowed to keep a larger proportion of their assets - the protection amount (Dubey et al. 2005, Zame 1993)[3]. This increases the demand for credit at a given interest rate. Changes in the level of protection will also affect the composition of borrowers: more risk averse borrowers might choose to use more debt since they weight the loss of their assets more severely. Therefore, an increase in level of asset protection might also lead to a change in the mix of borrowers, but in this case by drawing in new (more risk-averse borrowers), or by encouraging existing borrowers to take on more debt. Interest rates must therefore rise in equilibrium; but depending on which effect dominates (demand or supply), there can be an increase or decrease in the amount of credit

[1] Debt amounts converted to year 2000 constant dollars to reflect change adjusted by inflation, see Figure 1.

[2] Furthermore, lenders' willingness to supply credit will vary depending on their ability to screen borrowers.

[3] Non-state contingent contracts are a key friction here; in the absence of this friction, the effect of personal bankruptcy protection on household borrowing disappears. One possible explanation for why lenders do not offer more flexible contracts (more protection in "bad" states, or state contingent repayment) is that these lenders could face a collective action problem: if only one lender offered such a contract it would attract predominantly bad type borrowers, which is not an equilibrium. Alternatively, customized state contingent contracts could be hard to enforce.

extended.[4]

We use the timing of state changes in the levels of bankruptcy protection in a difference in difference design to identify their effect on the credit market equilibrium. We find that bankruptcy protection laws increase borrowers' unsecured credit holdings, mainly credit cards, leaving their level of secured debt – mortgage and auto loans – unchanged. At the same time we find an increase in the interest rate for unsecured credit, but not for other types of credit. These results are predominantly driven by low-income areas, and suggest that bankruptcy protection levels provide important downside insurance, which has first order effects on the supply and also on the demand for credit. More importantly, the results are robust to the look at similar counties across state borders controlling for unobserved time-varying heterogeneity, which mitigate concerns about the nature of the changes in protection. Interestingly, using detailed individual data, we do not find an increase in default rates for home-owners, which suggests that this households are increasing their demand for credit, but no necessarily over-borrowing or risk shifting as a response to the increase in protection, this results are mainly driven by existing credit card holders.

Empirically identifying the true effect of bankruptcy protection levels on household leverage is challenging, as these levels are correlated with unobservable borrower and lender characteristics that might simultaneously affect credit availability, and the level of protection. For example, states with higher protection levels may be states in which the pool of borrowers is risky, and therefore lenders are less willing to supply credit. This in turn will lead to a negative correlation between debt and protection, that is not due to the level of exemption but to the riskiness of the pool of borrowers. Thus looking at the cross-sectional correlation between debt and protection will lead to a biased result.

Therefore, we exploit changes in the dollar amounts of asset protection under bankruptcy to identify the effect of this protection on household debt[5]. Our identification benefits from the fact that states increased bankruptcy protection at different times and by different amounts over our sample period. This allows us to disentangle the effect of bankruptcy protection levels on household leverage from other determinants of household debt that may be changing as well. In fact, we show that when unobserved cross-sectional heterogeneity (for example, state fixed effect) is not accounted for the supply effect seems to dominate leading to a negative correlation between debt and protection, which is different to our results that shows that after controlling for state fixed effects the demand effect dominates.

We then estimate the effect of the changes in the levels of protection on changes in household debt. In doing so, we compare the change in the level of household debt for counties in a state that increases the level of protection between t and t+1, with counties in a state that did not change their level of protection during the same period. The variation in bankruptcy protection changes over time and across states, which helps us to deal with two crucial assumptions of any difference in

[4] For a more developed model see Appendix A.

[5] Asset protection in our empirical implementation is the sum of homestead exemption and personal assets exemption levels for each state and year. Our results are invariant to the use of only homestead exemption.

difference estimator. First, that the timing of the changes in the levels of protection are uncorrelated macroeconomic conditions and other determinants of credit equilibrium, most importantly changes in state level house prices and unemployment rates. And second, that after controlling for observed time-varying characteristics, linear county trends, and time-invariant county characteristics, changes in protection at the state level only affect the states which adopted the change, making the change in the level of protection the only determinant of the difference in household debt across states. Our empirical strategy is therefore similar to Cerqueiro and Penas (2011) and Cerqueiro et al (2013) who examine the effect of bankruptcy protection on start-up performance and innovation respectively.

Our results show that the exogenous variation in the levels of protection causally increases the level of credit card debt held by households during our sample period (1999-2005)[6], leaving secure debt (mortgage and auto) unchanged. This is consistent with the fact that personal bankruptcy allows households to discharge only unsecured debt[7]. Using novel bank branch-level data on credit rates for different types of credit, we explore the effect of bankruptcy protection changes on interest rates, and we find that an increase in bankruptcy protection leads to an increase in the interest rate on unsecured credit, which is consistent with a credit market equilibrium, where supply decreases and demand increases but the net effect is dominated by the demand response.

A possible concern may be that states which did not change the level of protection within our sample period are not a good control group, as they could be systematically different from the group which did opt to change their level of bankruptcy protection, and this would therefore invalidate our empirical inference. However, the staggered nature of our empirical strategy, whereby each state which changed its level of protection is a control for past and future periods for other changes, allows us to replicate our findings focusing only on the states where changes in protection levels were implemented in our sample period (i.e. "eventually" treated). In this case the effects we estimate are unchanged.

We also look at the dynamics of the changes. By analyzing the timing, we can rule out that the level of protection may be correlated with pre-existing state specific trends that survive our controls, and thus that our results are a reflection of these differential pre-trends rather than changes in the levels of protection. We show that our estimates are not affected by the inclusion of lag changes in the levels of protection, and that the coefficients on the lags are small in economic terms, and statistically insignificant.[8]

We now explore the heterogeneity of the average treatment effect. Exploiting within-state variation

[6] We focus on the Pre-Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), where the cost of filing for bankruptcy was low, and therefore the intensity of the treatment was higher. The bankruptcy reform makes the process of filing for bankruptcy harder, which ex ante diminished the incentives to take on more credit. The nature of the subprime crisis of 2007 and financial shock of 2008 may have affected household willingness to take on credit, and lenders' ability to supply credit, contributing to the lack of the effect during the post-reform period. We empirically investigate this by extending our sample until 2009; we find that changes in the law have no effect on unsecured debt held after the reform, see Online Appendix B8.

[7] The fact that the levels of protection only affect unsecured credit holdings helps to rule out that protection levels do not endogenously increase when the credit market becomes looser.

[8] Considering that our exogenous variation is at the state level, we cannot control for state-time unobserved heterogeneity that is contemporaneous to the effects we observe.

on the levels of debt held by counties, we find a stronger increase in the level of unsecured debt held by lower-income counties[9]. These results are consistent with the fact that increases in personal bankruptcy protection levels improve risk-sharing; this improvement should be stronger for lower-income regions, as they have fewer resources to diversify their risk exposure than wealthier ones, for which the differential impact of the increase should be smaller.

Personal bankruptcy levels of protection are heavily concentrated on home equity; a big fraction of the protected nominal amount is exclusively linked to the home equity of the borrower. In line with a demand driven channel, we find that the effect is almost three times stronger in areas where homeownership is higher, after we condition on the level of income. Also conditioning on the level of income[10], we find that the increase in credit is stronger in areas where the banking industry is more concentrated (fewer banks), which is consistent with the relationship lending model proposed Petersen and Rajan (1995), where creditors are more likely to finance a credit constrained borrower when credit markets are concentrated, because it is easier for these creditors to internalize the benefits of assisting these borrowers; although this is only suggestive evidence.

Overall we find that the average credit card balance in a county in our period is 290 million dollars in credit card debt, and the average increase in credit card debt is 7.6%. Our main estimate explains 10% of this balance growth[11]. However, this value more than triples for low-income homeowners and for our micro-level sample, for which our estimate explains 34% and 47% respectively of the increase in credit card balance. This heterogeneity seems to suggest that this affects only a subset of people: homeowners who are expecting to be close to distress level on their credit cards[12]. There is also the possibility that our estimates are biased downward (attenuation bias), due to measurement errors of our treatment.

As mentioned before, local economic conditions could produce spurious effects due to geographical heterogeneity that is uncorrelated to changes in the levels of protection. To overcome this endogeneity we compare neighboring county-pairs across state borders, within the same income bucket. The results of the estimation of changes in protection within each county-pair are very similar to the main estimates, and stronger when we concentrate on county-pairs in the lower end of the county income distribution. Furthermore, we show that other observables characteristics such as unemployment, income and house prices, do not correlated with changes in the level of protection within county-pairs across state borders ruling out that differences in credit card balances are driven by differences in these variables.

[9] Within each state, counties are divided into terciles based on total wages and salary levels in 1999.

[10] Homeownership and bank concentration are correlated with income at the county level. Therefore, looking at cross-sectional variation without controlling for income is not informative, as it provides confounding information within all the correlated variables. In order to overcome this limitation of the data, we replicated the specification of interest for each income subgroup; this strategy proved to be useful. For example, under this setup, unemployment heterogeneity within income groups has no cross-sectional implications. However, homeownership and bank concentration still provide meaningful variation within income groups.

[11] This percentage is estimated using the average change in protection in our sample period, approximately 40k dollars, which represents a 54% change with respect to the average exemption level of 70k dollars. This value is a more conservative measure than using one standard deviation of level (70k dollars).

[12] Appendix B2 shows that within low-income areas the effect is differentially stronger for areas with a higher proportion of credit card delinquency (90+).

The aggregate results raise important questions about how credit expands in response to bankruptcy protection, and by whom; and whether it affects the overall composition and default probability of borrowers. We use detailed individual data containing debt levels and specific account information to understand and empirically test household behavior. We find that changes in protection levels increase the number of credit cards per household; this increase is stronger among households that had ex ante credit card accounts and those that had a positive balance. Finally, changes in protection are uncorrelated with entry into the credit card market, defined as the time when a member of a household opens their first account, or as the time when a credit card balance goes from zero to positive. All these results provide evidence that in this sample, the effect is driven by existing debtors expanding their current balance, or their number of accounts, rather than new households entering the credit market.

Focusing on the same sample, we explore their delinquency behavior up to three years after the increase in credit card usage induced by the change in protection. Within this sample there is no measurable average increase in levels of delinquency. If the households which are increasing their level of debt are over-borrowing, or taking on more risky projects, we would expect delinquency rates to increase. Exploring the heterogeneity of this effect we find that the no increase in delinquency is driven by high assets individuals (home owners). In contrast, low assets individual seems to increase the probability of delinquency after increases in debt holding, which is consistent with the ex-ante increase in probability of default being ex-post binding for these individuals. Although we cannot completely rule out over-borrowing or risk shifting behavior, the results described are more consistent with risk-averse borrowers increasing their debt as a result of the increase in downside protection, specially in the case of home owners[13].

Furthermore, using county self-employment information, we show that areas that experienced an increase in the level of credit card debt also experienced an increase in the level of self-employment creation, specifically in industries that use more credit cards as start-up capital[14]. It is important to point out that these outcome variables are only suggestive evidence of the real effect of the increase in the level of unsecured debt, as they represent county aggregates.

The results are also robust to restricting the sample to states which changed the level of protection only once during the sample period, to considering only states with large changes in protection as treated states, and to the use of an indicator instead of the magnitude of the change. Given the nature of our empirical strategy, as we argue before, time-varying changes at state levels may be omitted variables explaining our results; one candidate is the level of unemployment insurance in each state (Hsu et al., 2012). However, the inclusion of this variable has no impact on the estimated coefficient.[15]

[13] Also, at the county level, delinquency rates do not seem to increase, which implies that also at the aggregate level, increases in the level of protection did not lead to an increase in the level of delinquencies.

[14] For example, construction, photography, and other low capital-intensity industries that can be financed with credit card debt. This evidence is consistent with Cohen-Cole et al., 2016

[15] As a case study during our relevant sample period, 1999–2005, one state went from having some level of protection to unlimited protection. When we include this time-varying dummy in the regression, we find that the main effect is unchanged, but the unlimited protection dummy is negative and significant for mortgage and credit card debt. This

Our results suggest that existing borrowers increase their leverage without increasing their ex post delinquency, consistent with risk-averse, constrained borrowers reacting to the increase in insurance. We cannot say anything about the welfare effect of these changes. In a world with complete markets, increases in protection will constrain the contract space and therefore may lead to inefficiencies. Furthermore, in the presence of limited commitment, harsher penalties for defaulting could improve welfare ex ante (Kehoe and Levine 1993, Alvarez and Jermann 2000). However, if state contingent contracts are not available (i.e. incomplete markets), a pro-debtor bankruptcy code could lead to welfare gains (Link 2004). Therefore, theoretically the effect of increased bankruptcy protection on welfare is undetermined, and dependent on modeling choices.

A number of earlier papers have looked at the cross sectional relationship between the level of bankruptcy protection and consumer credit. See for example Gropp et al. (1997), the first paper to examine this relationship. Using household data from the 1983 Survey of Consumer Finances, they found that higher levels of protection were associated with both reduced credit availability for low-asset households and increased debt balances among higher-asset households. Similarly Berger et al. (2010) found that higher protection is associated with lower access to credit for unlimited liability firms; also, Lin and White (2001) found the same relationship for mortgage credit**.** Also, Agarwal et al (2003) found that in the cross-section level of protection are correlated with higher ex-post delinquency. The recent legislative history of staggered introduction of bankruptcy exemptions in combination with household data allows us to identify the effects of changes in bankruptcy protection on the change in the supply and demand of credit for different types of debt. Most importantly, we find that an increase in personal bankruptcy protection leads to an increase in the amount of unsecured debt held by households, leaving secured debt unchanged. Therefore, using an improved empirical strategy, we see that the demand effect of bankruptcy protection, arguably driven by improved risk-sharing, dominates its supply-deterring effects. Furthermore, when we replicated within our sample previous cross-sectional analysis (such as Gropp et al., 1997 among others) that did not control for unobservables characteristics across states; we find, consistent with their estimates, a negative correlation between level of protection and mortgage debt, and not significant correlation with other types of debt. These results allow us to rule out that differences with previous estimates are due to different sample periods, but more importantly highlight the novelty of using changes in the level of protection when evaluating the effect of bankruptcy laws across states. Hence, this paper shows that increased bankruptcy protection increased equilibrium debt reliance consistent with a demand effect dominance, particularly for low-income homeowners between 1999-2005.

Increases in personal bankruptcy protection results in a weakening of creditor rights. There is a vast literature in corporate finance that has examined the effect of changes in creditor protection on debt (La Porta et al. 1998, Levine 1998, Djankov et al. 2007). Most related to this paper is Vig (2013), which looks at increases in the seizability of assets for large firms in India, and how this triggers a drop in the demand for secured debt. Vig (2013) suggests that this demand response is driven by

suggests that the effect of protection is a non-linear function of the level of exemption, and therefore above a certain threshold lenders increase prices to a magnitude which decreases quantities.

an increase in the threat of early liquidation due to the increase in creditor protection. Our paper focuses on a different channel, i.e. changes in the self-selection of households with different risk aversion levels, or their willingness to default strategically.

The rest of the paper proceeds as follows: Section 2 explains the institutional framework of personal bankruptcy laws and related existing literature; Section 3 outlines the empirical hypothesis with a theoretical focus; Section 4 describes the data; Section 5 develops the empirical strategy; and Section 6 shows the results before the conclusion.

2 Bankruptcy Procedure and Related Literature

2.1 Institutional Framework

Personal bankruptcy procedures determine both the total amount that borrowers must repay their creditors and how repayment is shared among individual creditors. An increase in the amount repaid may benefit all individuals who borrow, because higher repayment levels may cause creditors to lend more, and at lower interest rates. However, a larger repayment amount implies that borrowers need to use more of their existing assets and/or post-bankruptcy earnings to repay pre-bankruptcy debt, therefore reducing their willingness to borrow and their incentive to work[16].

US bankruptcy law has two separate personal bankruptcy procedures, which are named as they appear in bankruptcy law, Chapter 7, and Chapter 13. Under both procedures, creditors must immediately terminate all efforts to collect from the borrower (such as letters, wage garnishment, telephone calls, and lawsuits). Most consumer debt is discharged in bankruptcy, however most tax obligations, student loans, allowance and child support obligations, debts acquired by fraud, and some credit card debt used for luxury purchases or cash advances are not.

Mortgages, car loans, and other secured debts are not discharged in bankruptcy, but filing for bankruptcy generally allows debtors to delay creditors from retrieving assets or foreclosure. Prior to the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), debtors were allowed to freely choose between the two.

Bankruptcy Law Before 2005

The most commonly used procedure before 2005 was Chapter 7. Under it, bankrupts must list all their assets. Bankruptcy law makes some of these assets exempt, meaning that they cannot be seized by creditors. Asset exemption amounts are determined by the state in which the borrower lives. Most states will have personal asset protection, which exempts debtors' clothing, furniture, "tools of the trade", and sometimes equity in a vehicle. In addition, nearly all states have some

[16] See Dobbie and Song (2013) for a more detailed description of this issue.

level of homestead protection for equity in owner-occupied homes, but the levels vary from a few thousand dollars, to unlimited amounts in six states, including Texas, Florida, and DC[17]. This exemption level is what we refer to here as the protection level. Under Chapter 7, debtors must use their non-protected assets to repay creditors, but they are not obliged to use any of their future income to make repayments.

Under the alternative procedure in Chapter 13, bankrupts are not obliged to repay from assets, but they must use part of their post-bankruptcy income to make repayments. Before 2005, there was no predetermined income exemption; on the contrary, borrowers who filed under Chapter 13 proposed their own repayment plans. They often proposed to repay an amount equal to the value of their non-protected assets under Chapter 7. Also, borrowers were not allowed to repay less than the value of their non-protected assets and, since they had always the option to file under Chapter 7, they had no incentive to offer any more. Judges did not need the approval of creditors to approve repayment plans.[18]

The cost of filing for bankruptcy before 2005 was low: about 600 dollars under Chapter 7, and 1,600 dollars under Chapter 13, as of 2001 (White 2007). The punishment for bankruptcy included making bankrupts' names public and the appearance of the bankruptcy filing on their credit records for 10 years subsequently. In addition, bankrupts were not allowed to file again under Chapter 7 for another six years, (but they were allowed to file under Chapter 13 as often as every six months)[19].

Overall, these features made US bankruptcy law very pro-debtor. Since debtors could choose between the procedures under Chapters 7 and 13, they would select the procedure which would maximize their gain from filing. Around three quarters of all those filing for bankruptcy used Chapter 7 (Flynn and Bermant, 2002). Most debtors who filed under Chapter 13 did so because their gains were even higher using this procedure than under Chapter 7.

The Bankruptcy Abuse Prevention and Consumer Protection Act

The Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005 made several major changes to bankruptcy law. First, it abolished the right of debtors to choose between Chapters

[17] See Table 2 for summary statistics of the level of protection.

[18] Even when households file under Chapter 13, the amount that they are willing to repay is affected by Chapter 7 bankruptcy protection. For example, suppose that a household that is considering filing for bankruptcy has 40,000 dollars in assets and is located in a state in which the protection level is 20,000 dollars. Since the household would have 20,000 dollars of unprotected assets if filing under Chapter 7, it would be willing to repay no more than 20,000 dollars (in present value) from future income if it were to file under Chapter 13. As a result of this close relationship between Chapter 7 and Chapter 13 bankruptcy filings, we assume that changes in Chapter 7 protection levels will affect household willingness to file for bankruptcy (either under Chapter 7 or 13).

[19] US bankruptcy law allowed additional debt to be discharged under Chapter 13. Debtors' car loans could be discharged to the extent that the loan principal exceeded the market value of the car (negative equity). Also, debts acquired by fraud and cash advances obtained shortly before filing could be discharged under Chapter 13, but not under Chapter 7. These characteristics were known as the Chapter 13 "super-discharge", and some households took advantage of the situation by filing first under Chapter 7, where most of their debts were discharged, and then converting their filings to Chapter 13, where they proposed a plan to repay part of the additional debt covered under Chapter 13. This two-step procedure, known as "Chapter 20", increased borrowers' financial gains from bankruptcy as opposed to filing under either procedure separately.

7 and 13; now debtors must pass a new "means test" to file under Chapter 7. Debtors qualify for Chapter 7 if their monthly family income average over the six months prior to filing is less than the median monthly family income level in the state in which they live, adjusted for family size. In some places households could be allowed to file under Chapter 7, without satisfying the means test, as long as their monthly "disposable income" was lower than 166 dollars per month. Thus, the 2005 law prevents some wealthy debtors from taking advantage of the unlimited income exemption in Chapter 7. The reform also imposed new restrictions on strategies used to protect high value assets in bankruptcy. For example, state of residence home-equity protection is only valid after two years of residency in that state, and within 2.5 years the level is capped at 125,000 dollars. Finally if borrowers convert non-exempt assets into home-equity by making a down payment on their mortgage, they must do so at least 3 and one third years before filing (White, 2007).

The second major change under the BAPCA is a uniform procedure that determines repayment obligations under Chapter 13. Debtors must now use 100 percent of their "disposable income" for five years following their bankruptcy filing to make repayments[20]. Third, BAPCPA greatly raised bankruptcy costs, and households are now required to take a financial management, and also a credit counseling course before their debts are discharged. They must file detailed financial documents, including copies of their tax returns for the previous four years, which may force them to prepare unfilled tax returns. Filing fees have also increased. These new requirements have increased debtors' out-of-pocket costs of filing to around 2,500 dollars to file under Chapter 7 and 3,500 dollars under Chapter 13 (Elias, 2005), not forgetting the cost of the two training courses, and the preparation of tax returns.[21]

BAPCPA among other things also increased the minimum time that must pass between bankruptcy filings from six to eight years for Chapter 7, and from six months to two years for Chapter 13 filings[22]. Therefore, fewer debtors than before are eligible for bankruptcy at any given period.

Overall, the adoption of BACPA increases the cost of bankruptcy, decreases the possible amount of debt discharged in bankruptcy, while implicitly decreasing income protection. Therefore, setting a maximum income level above which debtors can no longer gain from filing, making the US bankruptcy law more pro-creditor.

2.2 Related Literature

Gropp et al. (1997) was the first paper to use household level debt data to look at the difference on credit availability for different levels of protection. Using the Survey of Consumer Finance of 1983, they found that higher protection under personal bankruptcy is associated with a lower probability

[20] BAPCPA defines disposable income as the difference between debtors' average monthly family income during the six months prior to filing, with a new income exemption.

[21] A large proportion of the cost is attributable to the fact that bankruptcy lawyers can be fined if debtors' information is not accurate.

[22] BAPCPA also imposes a four-year minimum period, where no such minimum existed previously, for filing first under Chapter 7 and then under Chapter 13; and it also eliminates the "super-discharge" effect.

of access to credit, and a lower level of debt for low asset households, in states with more generous bankruptcy exemptions. Using detailed bank information, Berger et al. (2010) found that unlimited liability small businesses have lower access to credit in states with more debtor-friendly bankruptcy laws. In addition, these businesses face harsher loan terms: they are more likely to pledge business collateral, have shorter maturities, pay higher rates, and borrow smaller amounts. Also, Lin and White (2001) looked at how the protection levels affect the availability of mortgage credit application granting, finding that accepted applications are negatively correlated with the level of protection. However, all these studies use cross-sectional variation on protection to look at how these levels correlate with credit availability. Hynes et al. (2004) find that state levels of exemptions are correlated with bankruptcy filing rates and state redistributional policies to help the poor, among other variables that can be correlated with the supply of credit, suggesting that the examination of the impact of bankruptcy laws should not treat protection levels as exogenous variables. This paper contributes to this literature using state time variation in bankruptcy protection levels to overcome these endogeneity concerns when looking at relationship between bankruptcy protection and credit markets. Using this empirical strategy we find that increases in bankruptcy protection did not lead to a reduction in the amount of debt held by households.

Our empirical strategy is more closely related to the work of Cerqueiro and Penas (2011), who use state level variation in the level of bankruptcy protection to look at start-up creation, finding that increases in protection decrease start-up performance; and to Cerqueiro et al. (2013), who uses a similar strategy to look at the effect of personal bankruptcy laws on innovation, finding that there is an aggregate decrease in the level of innovative activity among small firms in places in which protection increased. The effect of the use of credit cards in entrepreneurial activity has also been studied by Chatterji and Seamans (2012). Using states' removal of credit card interest rate ceilings in 1978 they show that this deregulation increases the probability of entrepreneurial entry, arguably through an access to finance channel. Finally, Fan and White (2003) find that personal bankruptcy protection motivates entrepreneurial activity using cross-sectional variation in the level of protection. In this paper, we show that increases in bankruptcy protection are correlated with increases in self-employment. Although we cannot rule out a demand channel, it seems that bankruptcy laws could have an expansive impact on self-employment through an increase in the credit channel.

Bankruptcy laws directly affect unsecured debt, given that secured debt cannot be discharged. Therefore this paper is related to the literature on credit card borrowing. Agarwal et al. (2013), analyze the effectiveness of consumer financial regulation in the credit card market, using the 2009 credit card reform. They find that regulatory limits on credit card fees reduce the overall borrowing cost to consumers by 2.8% of average daily balances. Gross and Souleles (2002a) use credit card account data to analyze how people respond to increases in the supply of credit; they find that increases in credit limits generate an immediate response to debt, which implies a big sensitivity of households to credit market changes. Gross and Souleles (2002b) use credit card accounts to analyze credit card delinquency to highlight the importance of time-varying household characteristics on their ex post behavior. Our paper contributes to this literature, showing new evidence of how

bankruptcy protection affects the demand for credit card debt.

This paper also relates to the studies that focus on the effect of personal bankruptcy on filings and delinquency rates. Gross et al. (2013) use tax rebates to find that households have a significant sensitivity of income to probability of filing, which is consistent with the high sensitivity of financially constrained agents to increase leverage as credit availability increases, found by Gross and Souleles (2002b). White (2007) looks at the effect of the interaction between personal bankruptcy filings and credit card growth before the adoption of the new Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCA), arguing that the increase is due to the debtor friendly bankruptcy laws in the pre-2005 period. In a related article, Jagtiani and Li (2013) focus on the ex post effect of filing, and find that after a consumer files for bankruptcy, there are long-lasting effects on their availability of credit. Also, Agarwal et al. (2003) found that in the cross-section levels of protection are correlated with higher delinquency and bankruptcy rates. This paper contributes to this literature providing panel level evidence of how bankruptcy protection affects the mix of borrowing with no impact on population average delinquency behavior[23].

Furthermore, the protection of assets under bankruptcy affects the amount of household collateral, and thus, their access to credit. Since Bernanke and Gertler (1989), or Kiyotaki and Moore (1997), a number of theories have suggested that improvements in collateral values ease credit constraints for borrowers. The collateral lending channel builds on the idea that information asymmetries between lenders and borrowers can be alleviated when collateral values are high (Hart and Moore, 1994).[24] From an empirical point of view, the collateral channel has been explored in its effect on firms, by Benmelech and Bergman (2011), and Chaney et al. (2012); and credit availability for small businesses, by Hurst and Lusardi (2004), and Adelino et al. (2013). The effect of housing collateral on household leverage has also been analyzed, by Mian and Sufi (2011).

Increases in bankruptcy protection can also be seen as decreases in creditor rights, which connects this paper to a large literature tracing the link between creditor rights and financial development, pioneered by La Porta et al. (1998), and including Levine (1998); Djankov et al. (2007); and Haselmann et al. (2010). Overall, this literature reports a positive correlation between increases in creditor rights and the amount of credit.[25] Most relevant to the current paper is Vig (2013), which looks at the increase in creditor protection for secured debtors in the context of large firms in India. The main difference between Vig (2013) and this paper (besides the fact that this paper looks at US households, as opposed to firms in India), is how demand responds to changes in creditor protection. In Vig (2013), the decrease in the amount of secured debt is driven by an increase in the threat of early liquidation, which firms face due to the increase in creditor protection.[26] In the

[23]We found an no significant average treatement effect of increases in protection in deliquency, that is mostly drivwn by high-assets individuals (home owners)

[24] Rampini and Viswanathan (2010) in the context of a firm's access to credit.

[25]Most recently, there are other papers which have looked at the same relationship but using cross-country settings: Gianetti (2003); Qian and Strahan (2007); Acharya et al. (2011); and Davydenko and Franks (2008).

[26]This is consistent with the corporate literature on bankruptcy reorganization which suggested that excessive creditor rights can lead to ex post inefficiencies in the form of a liquidation bias (Aghion et al. (1992); Hart et al. (1997); Stromberg (2000); Pulvino (1998); and Povel (1999).

current paper, the demand response (increases in the demand for credit card debt), is based on an insurance channel which relies on household risk aversion, and/or an increase in the number of strategic borrowers.[27]

This paper is also related to previous studies that have looked at the effect of bankruptcy laws design in the context of corporate bankruptcy (Baird and Rasmussen, 2002; Bolton and Scharfstein 1996) and contemporaneous studies looking theoretically at the optimal design of personal bankruptcy laws (Davila, 2015). In this context there is a large literature that describes the tension between ex ante and ex post efficiency in any bankruptcy design. For instance, Gertner and Scharfstein (1991), and Hart (2000), show the incentives of the debtor and creditors under corporate resolution in a theoretical framework, and demonstrate how debt contracts can lead to inefficient liquidation and underinvestment. This framework is also relevant when thinking about the incentives for households to file for bankruptcy. Empirically, Chang and Schoar (2013) look at the judge-specific fixed effect, showing that pro-debtor judges have worse firm outcomes after Chapter 11, suggesting that this is a result of managers and shareholders' incentives misalignment, highlighting how bankruptcy codes can have a significant impact on ex post outcomes. Furthermore, Iverson (2013) looks at the effect of bankruptcy courts' reduction in court caseloads due to the consumer bankruptcy reform in 2005, finding that firms in more pro-debtor courts allow more firms to reorganize and liquidate fewer firms.

Finally, this paper is complementary to studies looking at the effect of personal bankruptcy laws on labor markets. Dobbie and Song (2013) find that filing for bankruptcy under Chapter 13 has a significant effect on increasing earnings and employment, and also decreases mortality, suggesting that consumer bankruptcy benefits are an order of magnitude larger than previously estimated, and the role that bankruptcy laws played during the last recession (Dobbie and Goldsmith-Pinkham, 2015)[28].

3 Data and Summary Statistics

3.1 Data Description

In order to address the impact of changes in bankruptcy protection on household debt, we collect and combine different data sources. The three main data sources include time series of state levels of protection under bankruptcy, and geographical distribution of household debt and interest rates information. In this section we describe this datasets in detail.

The level of protection or exemptions represents the dollar amount of equity that the debtor is entitled to protect in the event of bankruptcy; it represents the amount of home equity and other

[27] Examples of papers showing the costs of increases in creditor rights include: Acharya et al. (2011); Acharya and Subramanian (2009); and Lilienfeld-Toal et al. (2012).

[28] See White (2005) for a complete review of the literature.

personal assets that are protected. This information was manually extracted and compiled from many sources, from state bankruptcy codes to bankruptcy filing manual books[29].

We obtain level debt balances from the Federal Reserve Bank of New York Consumer Credit Panel/Equifax (CCP). This quarterly panel dataset is a 5% random sample of individuals in the US who have a credit history with Equifax and a social security number associated with their credit file. Debt data reported includes mortgage balances, home equity installment loans, and home equity lines of credit; auto loans, including loans from banks, savings and loan associations, credit unions, auto dealers and auto financing companies; and credit card debt: revolving accounts from banks, national credit companies, credit unions, and bankcard companies. The county level data is an aggregate of this information from 1999 to 2005 where, for privacy reasons, reporting is done only for counties with an estimated population of at least 10,000. This information is available for all debt types and the fraction of household with delinquency status of 90 days late is provided as well. The micro level data includes household level data of the debt variables described above, plus detailed information on credit card accounts and individual level delinquency status: current, 30 days late, 60 days late, 90 days late, 120 or more days late, and severely derogatory. The individual level data permits a unique insight into the ex post behavior of households, as we are able to track the delinquency behavior of consumers before they are affected by the change in protection[30].

We obtain interest rates from Rate-Watch. It provides historical rate and fee data from banks and credit unions across the country for a wide variety of banking products, such as CDs, checking, savings, money markets, promotional specials, auto loans, unsecured loans, and credit cards. They collect information at the branch-setters level by survey, and archive the information on a regular basis. For our purpose, interest rates for unsecured loans, credit cards, and mortgage loans are aggregate at the county level using branch-setter rate levels for the last quarter of each year to be consistent with the aggregate debt balances measure. We then use this detailed geographically dispersed measure of interest rates from 1999 to 2005 to analyze the supply response of changes in personal bankruptcy protection.

County level income is measured as total wages and salary in a county according to the IRS; this data is available from 1999 to 2005. The house prices used in the regressions are obtained from the Federal Housing Finance Agency (FHFA) House Price Index (HPI) data at a state level. The FHFA house price index is a weighted, repeat-sales index and it measures average price changes in repeat sales or refinancing on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. We use data on the state level index between 1999 and 2005.

County based unemployment levels and unemployment rates are obtained using the Bureau of Labor Statistics Local Area estimates. Local Area Unemployment Statistics (LAUS) are available between 1976 and 2012 for approximately 7,300 areas that range from census regions and divisions

[29] How to file for Chapter 7 Bankruptcy, Elias Renauer and Leonard Michon. Nolo editorial (1999-2009)
[30] See Lee and van der Klaauw (2010) for details on the sample design.

to counties and county equivalent. We match the county equivalent data to the CCP data using Federal Information Processing Standard (FIPS) county unique identifiers.

To look at the determinants of change in exemptions, we use four additional data sources: changes in state total medical expenses extracted from the National Health Expenditure Data, Centers for Medicare and Medicaid Services; state level changes in GDP and Personal Income from Bureau of Economic Analysis (BEA); bankruptcy filing statistics at the state level from the Statistics Division of the Administrative Office of the United States Courts[31]; and measures of political climates using the share of votes for the Democratic Party in the last House of Representatives election obtained from the Clerk of the House of Representatives (CHR).

The net creation of sole proprietorships at a county level is obtained from Census non-employer statistics; we obtain the number of establishments for the period of 1999 to 2009 at the 2-digit NAICS level. In order to construct a measure of industries that use credit card as a source of capital, we look at the Survey of Business Owners (SBO) Public Use Micro data Sample (PUMS). The SBO PUMS was created using responses from the 2007 SBO and provides access to survey data at a more detailed level than that of the previously published SBO results. The SBO PUMS is designed to study entrepreneurial activity by surveying a random sample of businesses selected from a list of all firms operating during 2007 with receipts of $1,000 or more provided by the IRS. The survey provides business characteristics such as firm size, employer-paid benefits, minority- and women-ownership, access to capital, and firm age. For the purposes of this paper, we classified industries based on the "use of credit card as a start-up capital" for each firm and we group the answers to this question at the 2-digit NAICS industry level (the finest level available in the data) for firms established in 2007, and then focus specifically in 1-4 employee firms only.

3.2 Summary Statistics

Table 1 shows a description of our main variables; the sample spans from 1999 to 2005. The total debt balance in a county is 2.91 billion dollars. The level of credit card balance is 0.29 billion dollars. When looking at states that "eventually" change their level of protection during our sample period and compare them to states that never change their level of protection, the former holds 0.36 billion dollars on average, and the latter 0.22; however the difference is not statistically significant.

The average debt growth in a county was 12.2%, and credit card debt growth during the same period experienced the same pattern, with a 7.6% average annual growth, with no significant difference between the "eventually" treated and the never treated group. The summary statistics seem to show that credit card balances are a small proportion of the average household balance sheet, as mortgage debt accounts for most of consumers' debt claim. However, it is important to point out that when compared in terms of monthly payments, this difference is much smaller, and arguably credit card debt is an important part of household budget and a relevant medium to relax budget constraint, allowing households to shift inter-temporal consumption (White 2007).

[31] See http://www.uscourts.gov/Statistics/BankruptcyStatistics.aspx

The only strong significant difference between the two groups is seen in average house price growth. States which were never treated experienced a house price growth of 6.2% on average annually, and states which were eventually treated increased their house price growth by 8.8%. This difference is consistent with the fact that house prices are argued to be determinants of the changes in bankruptcy protection. However, we find in Table 4 that they have no predictive power in the changes in protection.

Table 2 shows the description of the exemption levels and changes from 1999 to 2005. First, it is important to notice that bankruptcy exemption changes are quite common within our sample period; over the whole time there are 37 changes within 26 states. The average level of protection is around 73,000 dollars, and a median of 55,800 dollars, with most of the value coming from the homestead exemption (protection over homeowners' equity). The average change in protection is close to 40,000 dollars, with a median of 15,400 dollars, with some changes being very small and associated to inflation adjustments, and others being very substantial. Figure 2 shows the geographical dispersion of these changes.

4 Empirical Hypothesis

Changes in the level of asset protection in bankruptcy affects credit markets' equilibrium through demand and supply. In order to guide our empirical analysis we review the differences dimension through which increases in asset protection can affect the supply and demand of credit, and review the implications for our empirical exercise.

Collateral channel. If markets are incomplete, the possibility of collateral pledging enhances agents' debt capacity, as it gives the lender the option to repossess assets ex post, reducing the risk of borrowers, and easing borrowers' access to finance ex ante (Hart and Moore, 1994). In our case, the increase in protection diminishes the collateral value of assets, as it decreases the availability of assets to be seized by lenders, making the supply of credit less attractive; therefore reducing borrowers' access to credit.

Insurance channel. In the presence of incomplete markets, increased protection also makes borrowing more attractive for risk-averse agents by improving risk-sharing. Effectively, the higher protection on the bad state of the world will incentivize risk-averse agents to take on leverage, increasing the demand for credit.

Moral hazard channel. An increase in the level of protection might also foster borrowers' incentives to undertake riskier projects or over-borrowing, increasing the demand for credit, and the ability of lenders to distinguish the type of borrower that are they facing will define the supply response. Furthermore, according to Stiglitz and Weiss (1981), lenders' profit functions could set an upper limit to the increase in interest rates, leading to a decrease in the quantities due to the increase in borrower risk. In summary, moral hazard increases the demand for credit, and in most cases, will reduce the supply of credit.

Adverse selection channel. If the level of protection increases, more strategic defaulters with private information about their future income or propensity to default could participate in the markets, aiming to profit from the new borrowing conditions, increasing the riskiness of the pool of borrowers and also the demand for credit. Again the equilibrium response will be driven by lenders' ability to screen new borrowers.

Therefore, the theoretical prediction is unclear, given that the net effect will depend on the relative magnitudes of the supply and demand response[32]. Interest must weakly rise in equilibrium, independent of the prevailing force. If the supply demand dominates, quantities should go down, but if the demand effect dominates, quantities should go up. We attempt to distinguish between these channels empirically.

It is plausible to imagine that in the presence of agency problems, a demand driven equilibrium takes place. In an extreme case, if the lender overestimates the quality of the pool of borrowers, the increase in protection would lead to an increase in quantities. However, in Appendix A we show that given very simple conditions, and without asymmetric information, we can observe a demand driven equilibrium where quantities and prices increase. This model of the credit market considers a risk-averse borrower who is financially constrained and a risk-neutral lender. The borrower has a stochastic income, and exogenous home equity that is realized in period 2. Only debt contracts are available. In case of default, the lender can seize the borrower's assets up to the exemption level dictated by law. The agents need to borrow in order to consume in period 1, while the interest rate is set such that the bank breaks even (zero profit). For a given interest rate, a risk-averse borrower will consume until a point where the marginal utility of consumption today is equal to the expected marginal utility in the future. Increased bankruptcy protection makes defaulting attractive to the borrower in more states of the world, and forces lenders to charge a higher interest rate to break even.

The model shows that for a certain region with a given level of protection in bankruptcy, when the level of protection is increased, the agent will be willing to take on more debt despite the increase in interest rates. This happens when the marginal benefit from the increase in consumption at period 1 is greater than the loss of utility in the good state in period 2, due to the repayment of their debt claim; as in the bad state they are indifferent due to the protection level. Furthermore, if the marginal benefit is not enough to overcome the loss of consumption during the good state, we should see a decrease in quantities and increase in prices. Using exogenous variation on the level of protection, we aim to identify the type of equilibrium that rises after an increase in the level of consumer protection under bankruptcy. These results, which are highlighted by the model, are relevant as they show that the insurance channel in itself could lead to a demand driven credit market equilibrium shift, without the presence of moral hazard or adverse selection.

Empirical Predictions

The exposed theoretical framework allows us to sharpen our empirical exploration. Based on the arguments above we have the following predictions.

[32] Figure 3 shows the possible outcomes in a simple demand and supply graph.

First, **if the demand effect dominates**, we should see an increase in quantities and prices. Furthermore, the increase in prices should be stronger for low-income borrowers, as the increase in risk-sharing (insurance channel) is more important for these borrowers, and they are also more likely to be under financial constraints.

The effect should be stronger for homeowners, as the change in asset protection affects home-equity holding predominantly (see Table 2). The increase in bankruptcy protection does not directly affect secured debt, as the bankruptcy code only discharges unsecured debt. Therefore, we should see weaker or no effect on secured debt.

Finally, if agency problems are an important driver of the increase in demand, we would expect to see a significant effect on ex post default, arguably driven by individuals who over-borrowed ex ante or invested in riskier projects.

Second, **if the supply effect dominates**, we should see an increase in prices and a decrease in quantities. The rise in prices should be higher in places where the riskiness of the pool of borrowers, or the ex ante probability of defaults, increases more. The effect should also be stronger where the fundamental value of the ability to pledge assets is higher, and court enforcement of bankruptcy contracts is lower.

Further, the effect should be stronger in areas where lenders have less information about their borrowers, as the dominance of the supply effect suggests that lenders are reducing the supply of credit more intensively.

In the next section we show the empirical strategy we used to identify the equilibrium change: we find that the quantities and price effect is consistent with a stronger demand effect, and we describe the set of tests that we used to assure this finding, and the empirical test that attempts to distinguish between the different channels.

5 Empirical Strategy

Empirically identifying the actual effect of bankruptcy protection levels on household leverage is challenging, as these levels are correlated with unobservable borrower and lender characteristics, which might simultaneously affect credit availability and the level of protection. For example, on the one hand, states with a higher protection level may be states where households are less financially savvy and, as a result, are more willing to take on more debt; this in turn will lead to a positive correlation between debt and protection. On the other hand, if the level of protection correlates with better local economic conditions, people will be less financially constrained, potentially taking on less debt, and thus leading to a negative correlation between debt and protection levels.

In this paper, we exploit exogenous variation in state level bankruptcy protection dollar amounts to identify the effect of this protection on household debt. We use different timing in the changes to

exemption levels by state to identify how exemptions affect household leverage (there were a total of 37 changes in exemptions between 1999 and 2005)

The proposed baseline specification is the following,

$$\Delta Debt_{it} = \alpha_i + \alpha_t + \beta_P \Delta Protection_{st} + \Gamma \Delta X_{it} + \varepsilon_{it} \quad (1)$$

Where $\Delta Debt_{it}$ is the log change in either credit card debt, mortgage debt, auto loan debt, in a county i and year t .$\Delta Protection_{st}$ represents the log change in the level of Chapter 7 protection (homestead plus personal) in a state s and year t .α_i is a county fixed effect, and α_t are year fixed effect.ΔX_{it} represents a vector of county controls changes, such as county unemployment rate, log of house prices, and log of income in a county.

We use the same specification in (1) to measure the effect of changes in protection on interest rates. To do so we replace the log change in debt, by changes in interest rates in percentage for mortgages, personal unsecured loans and credit cards.

Since changes in protection vary at the state level, but debt balances and interest rates are observed at the county or individual level, the error term in equation (1) has a potentially time-varying state component. Following Bertrand et. al (2004), the residuals are clustered by state. This allows for maximum flexibility in the variance-covariance matrix of residuals. It is also more general than state-year clustering, which would leave intact the possibility of serial correlation in the error term.

If the measure of debt and the controls all display heterogeneous trends across counties, the most parsimonious treatment of these trends is to take first-differences, as in the equation above[33], with variables in differences; the presence of county fixed effects guarantees that differential county specific trends are controlled for in all variables. A first-differences specification is suitable in our case as it accommodates the repeated treatment present in our sample (in our sample period some states did change their level of protection more than once). The regressor β_P captures the changes in debt within the year as the level of protection increases. Additionally, the use of the amount of protection, i.e., intensity of treatment, guarantees that the main estimate is driven by big changes in the level of protection. Furthermore, we will conduct alternative specifications to show that our results are robust to the use of level specification, and to the use of alternative measures of the treatment effect.

Effectively, we compare the change in the amount of debt between a county belonging to a state which increased the level of protection between t and t+1, with the amount of debt of a county belonging to a state in which the level of protection did not change during the same period. The two identifying assumptions are first, that the timing of the changes in the levels of protection are uncorrelated with determinants of household leverage; and second, that after controlling for observed

[33] Paravisini (2008).

time-varying characteristics, linear county trends, and time-invariant county characteristics, changes in the state level of protection will only affect the state which adopted the change, thus the only determinant of the difference in household debt across states is the exogenous change in the level of protection.

We assess the first identifying assumption by looking at the correlation between suspected determinants in the level of protection and changes in the levels of protection. Conventional wisdom attributes changes in the levels of bankruptcy protection to the gap between house prices and homestead exemption levels, as well as the cost of medical expenses. If our identification strategy is valid, changes in the measurable variables should be uncorrelated with changes in the level of protection, suggesting that the actual timing of the change is an exogenous shock to the credit demand and supply of credit in the affected regions.

To assess the second identifying assumption, we need to rule out alternative hypotheses that could explain our results. First, changes in the level of protection could be correlated with state specific pre-existing trends that survive our controls, and thus our results are a reflection of this differential pre-trend rather than a result arising from changes in the levels of protection. For example, states which increase their protection levels are states where economic conditions are booming in the period prior to the increase. We should expect that looking at the dynamic of the change, the inclusion of lags of the changes should have no effect on the coefficients and have no significant correlation with the levels of debt.

A second alternative hypothesis is that there are state specific credit market trends that are correlated with the changes in protection that would explain our findings. For example, the areas where the level of protection increased were areas where all credit availability for all types was expanded. To meaningfully differentiate the impact of the change in the level of protection from these alternative hypotheses, we use the fact that personal bankruptcy laws allow households to renege only on unsecured debt, which implies that changes in personal bankruptcy laws will only directly affect unsecured debt.

A third alternative hypothesis is that the observed increase in quantities is due to a contemporaneous decrease in prices that is correlated with the timing of the changes in bankruptcy protection. In other words, areas that increased the level of protection were areas where credit became cheaper. Using novel bank branch level data on credit rates for different types of credit, we can explore the effect of bankruptcy protection changes on interest rates; if interest rates are positively affected by the increase in the level of protection, it is less likely that our effect is driven by a relaxation of lending standards in credit markets.

Local economic conditions could produce spurious effects due to geographical heterogeneity that is uncorrelated to changes in the levels of protection. To overcome this endogeneity we compare neighboring county-pairs across state borders[34], but within the same income categories, using the following empirical specification:

[34] This methodology is similar to Heider and Ljungqvist (2013) and Dube et al. (2010)

$$\Delta Debt_{ipt} = \alpha_i + \alpha_{ipt} + \beta_P \Delta Protection_{st} + \Gamma \Delta X_{it} + \varepsilon_{ipt} \quad (2)$$

Where $\Delta Debt_{ipt}$ is the log change in either credit card debt, mortgage debt, auto loan debt; in a county i, pair p and year t. $\Delta Protection_{st}$ represents the log change in the level of Chapter 7 protection (homestead plus personal) in a state s in year t. α_i is a county fixed effect, and α_{ipt}, is a dummy for each neighboring county pair for each year. Note that variables for county i maybe repeated for all pairs of which they are part. In this setup our estimate β_P only uses debt variation within each neighboring county-pair across state borders. Our additional identifying assumption implies that the changes in protection are uncorrelated with the residual ε_{ipt} after controlling for observable characteristics, county fixed effects and county-pairs year fixed effect. We also assign counties to income buckets, and run the proposed specification only within county-pairs that are in the same income category.

To attempt to identify the channel that is driving the demand effect we use individual level data to look at debt change, entry to the credit card market, and delinquency. We use the same specification (1) as for the county aggregates, but changing the dependent variable, and including in this case the zip code level house prices, income, and county unemployment rates.

The change in debt for each individual is estimated using log changes, and it therefore represents the change in debt for existing debtors. When looking at the number of accounts, our dependent variable is the difference between the number of credit cards in t -1 and t. Entry is defined in two ways as follows: opening the first credit card, which is a dummy equal to one if the household did not have a credit card in t-1, and have one or more credit cards in t. Alternatively, entry is defined as a dummy equal to one if the balance becomes positive between t and t -1. Both measures attempt to capture the entry of new borrowers to the credit card market. Finally, to measure delinquency, this is a dummy equal to one if household i is delinquent at time t, t+1, t+2, and t+3 respectively, and the regressions are estimated separately. Therefore, the estimated coefficient represents an intent-to-treat effect, as the same individual may be affected by the change in the levels of protection more than once during our sample period.

Finally, we look at changes in the levels of self-employment to explore the effect on real outcomes. For this we use specification (1) but in this case, using the change in total county self-employment as a left hand side variable, or the change in self-employment in an industry and county between t and t-1.

6 Results and discussion

6.1 Bankruptcy Protection and Household Leverage and Interest Rates

We find that growth in bankruptcy protection leads to an increase in the level of credit card debt held by households (unsecured debt) between 1999 and 2005 (Table 3 Panel A). Moreover, the increase in protection has no effect on other types of secured debt (auto and mortgage, Table 3 Panels B and C)[35].

A possible concern may be that states which did not change the level of protection within our sample period are not a good control group, as they could be systematically different from the group which did opt to change their level of bankruptcy protection, and this would therefore invalidate our empirical inference. To overcome this concern, we replicated our main specification (Table 3 Panel A column 1), focusing only on the states in which changes in protection levels were implemented in our sample period (i.e. "eventually" treated, Table 3 Panel A column 6). In this case the main effects we estimate are basically unchanged, mitigating the endogeneity concern about the changes.

Table 9 replicates our main specification, but using interest rates changes as a dependent variable for personal unsecured loans, credit cards, and mortgage rates. The results show that the increase in bankruptcy protection leads to an increase in the level of interest rates for unsecured loans, but does not affect mortgage rates. These results suggest a demand driven credit market equilibrium, as we observe increases in quantities, and prices.

Furthermore, in Table 4, columns 1 and 2, we look at the correlation between the levels of protection and contemporaneous and lag levels of determinants, which in a traditional view would be seen as driving the changes in the level of protection. Empirically, levels seems to be correlated with housing price and bankruptcy filing rates, which is consistent with evidence that cross-sectional variation in the level of protection is a state specific characteristic. Furthermore, Table 4, columns 3 to 6, looks at how changes in the levels of exemptions correlates with change in the determinants above, using an OLS estimation clustering standard errors at the state level, or running a linear probability model of the likelihood of change. In both cases, lag change in the candidates' determinants have no predictive power on changes in the level of protection. This is consistent with our identification assumption, that the timing of the changes is exogenous to characteristics which define the supply and demand of credit.

While our results support the empirical strategy, there are alternative hypotheses that we need to rule out as explaining our results. First, changes in the level of protection could be correlated with pre-existing state specific trends that survive our controls, and thus our results are a reflection of

[35] The average effect is only present in the pre-bankruptcy reform period, when filing for bankruptcy was easier and cheaper (Table B8). If the cost of filing for bankruptcy increases enough, the effective protection is smaller, decreasing the ex ante benefit of increasing the amount of debt today. Considering that there is evidence that household bankruptcy filings are highly sensitive to liquidity constraint (Gross et al., 2013), we should expect the effect to be weaker or nonexistent during the post period.

these differential pre-trends rather than changes in the levels of protection. For example, states which increase their protection levels are states in which employment conditions are booming in the period prior to the change in protection levels. Figure 5 shows the estimate pre-trend coefficient for each type of debt, showing that the effect is nonexistent before the change and only increases afterwards. Table 5 looks at the effect of changes in protection when lags and leads of the changes are incorporated into the main specification; the first 4 columns show the specification without fixed effect, the second sets out with state fixed effect, and the last one with county fixed effect. These results show that our estimates are not affected by the inclusion of lag changes in the levels of protection, and that the coefficient in the lags is economically small and statistically insignificant[36]. Furthermore, the coefficients in the leads are increasing and statistically significant, especially for two periods after the change, which suggests that there may be an overreaction of households to the changes in the first year and a long term effect that continues up to year two.

Table 3 shows that the effect is concentrated in credit card debt (unsecured). This allows us to rule out the alternative explanation that our strategy is picking up state specific credit market trends that are correlated with the changes in protection and that can be confounded with our identified effect.

Table 8 shows the effect is stronger in counties that are in the lowest tercile of the within state income distribution, monotonically decreasing as the level of income increases. It is expected that lower-income areas may be more affected by increases in protection, as the impact of the improvement in risk sharing should be more significant.

Homeowner households should be more affected by the changes in the level of protection, as a big proportion of their protection comes from home equity protection. However, county level home-ownership is correlated with income, so in order to gain a meaningful perspective on this variation, we look at the within income group variation on county level homeownership. Table 8 column 3 shows that the differential effect is aligned with the prediction, as the estimated coefficient for these particular areas almost triples with respect to the baseline specification.

Following the same logic, we look at the within income group variation on bank concentration – a measure based on share of deposit holding at the branch level. Online appendix Table B2 column 2 shows that the effect is stronger in areas where markets are more concentrated, which is consistent with the Peterson and Rajan (1995) relationship lending model, where creditors are more likely to finance a credit constrained borrower when credit markets are concentrated because it is easier for these creditors to internalize the benefits of assisting these borrowers.

Another alternative explanation of our finding is that the increase in quantities is due to a contemporaneous decrease in prices, which correlates with the timing of the changes in bankruptcy protection. In other words, areas which increased the level of protection were areas in which credit became cheaper. As mentioned above, Table 9 show that the increase in bankruptcy protection

[36] Considering that our exogenous variation is at the state level, we cannot control for state-time unobserved heterogeneity that is contemporaneous to our effect.

leads to an increase in the level of interest rates for unsecured loans, not affecting mortgage rates. These results support our causal interpretation of the results, alleviating the concern that we are picking up a relaxation in the price of credit leading to an increase in quantities.

Local economic conditions could produce spurious effects due to geographical heterogeneity that is uncorrelated with changes in the levels of protection. To overcome this endogeneity, we compare neighboring county-pairs within the same income bucket. Table 6 Panel A, shows that when focusing on a county-pair in the same income bucket, the estimated results are very similar to the main specification. Moreover the effect is stronger when we concentrate on county-pairs in the lower end of the county income distribution. Furthermore, we repeated the same county-pairs analysis but using real economic variables as dependent variable; Table 6 Panel B, shows that increases in the level of protection are uncorrelated with unemployment, houses prices and income, after we control for time-varying unobservable local economic conditions, which allow us to rule out that our effect is driven by these observables variables.

One important concern is how much of the difference in our findings is due to the improved empirical strategy and how much is explain by the different time period in our sample. In order to answer this we replicated within our sample previous cross-sectional analysis (such as Gropp et al., 1997 among others) that do not control for unobservable characteristics across states in many cases due to data limitations. Table 7 shows that there is a negative correlation between level of protection and mortgage debt, and not significant correlation with other types of debt when the same analysis is run as a pooled cross-sectional regression. These results allow us to rule out that differences with previous estimates are due to different sample periods, but more importantly highlight the novelty of using changes in the levels of protection to identify whether the demand or supply effect dominates in in equilibrium.

Finally, in Table 11 Panel A, we replicated the average treatment effect but using individual level transaction for counties below the median income level. We find that increases in the level of protection significantly affect the credit card debt without affecting mortgage or auto debt, consistent with Table 3 estimates. This replication also shows a coefficient for credit card debt that is statistically different than the point estimate for other types of debt.

6.2 Robustness Test

We choose a first difference specification with county fixed effect to parsimoniously account for county level linear trends, and to account for multiples treatment for the same state across time. However, in Table 3 Panel A, we show that our estimation is the same if we exclude county fixed effect, and change them by state level fixed effect or run debt levels on protection level with county fixed effect. In other words, our effect is invariant to the specific difference in difference specification. Table 1 shows how the effect changes with different measures of the treatment. We choose to use an intensity of treatment measure as our treatment; however, as Table 3 Panel A shows, our results are invariant to the use of only large changes, use of exemption dummies instead of the intensity of

treatment, or if we restrict the analysis to only states which change their level of protection only once.

Given the nature of our empirical strategy, as we argue before, time-varying changes at state levels may be omitted variables explaining our results; one candidate is the level of unemployment insurance in each state (Hsu et al., 2012). Online appendix Table B1 shows that the inclusion of this variable has no impact on the estimated coefficient. The results are also robust to change, the depend variable for changes in debt to income, or percentage changes, or to replace the treatment only by the amount of homestead protection. Finally, all the results exclude DC, because within our sample period, this state changed the protection from a very low level to an unlimited level. If we include a time-varying dummy to account for this extreme change in the level of protection, Table B1 shows that it generates a decrease in the level of debt available to households, consistent with the empirical prediction of our model.

6.3 Magnitude of the effect

In terms of magnitude, we find that the average county in our relevant period (1999-2005) has a credit card balance of 290 million dollars, and the average increase in credit card debt is 7.6%. Our main estimate explains 10% of this balance growth. This magnitude represents the average treatment effect over the entire population. However, we believe that our effect is driven mostly by people close to financial distress, for whom the possibility of filing for bankruptcy is a real one. When we estimate the magnitude of the effect for the particular subgroup of areas, counties in the low-income tercile with higher homeownership percentage, we find that the effect now explains between 34% and 47% of the increases in their credit card balance. This heterogeneity is consistent with our interpretation that there is only one subset of people affected, e.g., homeowners within a county close to distress level on their credit cards. However, there is also the possibility that our estimates are biased downward (attenuation biased), due to measurement errors in our variables

6.4 Borrowers, Delinquency and Self-Employment

Important remaining questions to address, include which households are expanding the amount of credit they hold, how they are doing so, and what their ex post conduct may be. Using individual level data to look at the ex ante and ex post behavior of households, first we replicate the county level results focusing on areas that are below the median county income. Table 11 Panel A and B shows that the effect of changes in protection is similar to those found when we focus on the lower end of the county level distribution or county borders. When we focus on homeowners, defined as an individual for whom we observe home-related debt at some point between 1999 and 2005, the effect is stronger, which again is consistent with the county estimates (Table 11 Panel C).

Furthermore, using detailed account information, we show in Table 11 Panel B columns 2-4, that changes in protection causally increase the number of credit cards per household; this increase is

stronger among households that had ex ante credit card accounts. Even more interestingly, the increase in number of credit cards is stronger for households that also had a positive balance. This finding suggests that the credit expansion is due to existing borrowers acquiring more credit. Finally, Table 11 Panel B columns 5-6, show how changes in protection are uncorrelated with entry into the credit card market, defined as the time when a member of a household opens their first account, or as the time when their credit card balance goes from zero to positive. All these results provide evidence that in this sample, the effect is being driving by existing debtors expanding their current balance or their number of accounts, rather than new households entering the credit market.

Focusing on the same sample, we explore their delinquency behavior up to three years after the increase in credit card usage induced by the change in protection. Three years is a long time frame when considering holdings on a credit card. Table 12 shows that within this sample there is no measurable increase in the level of delinquency. We explore the heterogeneity of this effect by assets holding (home owners and no home owners), we find that low-assets individuals (non-homeowners) increase the probability of being delinquent in the future, but this effect is completely mask on average for the no increase in delinquency of home-owners, consistent with the fact that high asset individual (home owners) are the ones that expanded the most their existing debt balances without defaulting more ex-post . If the households that are increasing their level of debt are over-borrowing or taking on more risky projects, we would expect delinquency rates to increase. Although we cannot completely rule out an over-borrowing behavior, the results described for home owners are more consistent with risk-averse borrowers increasing their debt holding in response to the greater insurance received from the increase in protection.

We show that areas which experienced an increase in the level of credit card debt also experienced an increase in the level of self-employment creation, specifically within industries that make more use of credit cards as start-up capital. Table 13 shows that, on average, the increase in self-employment is only positively correlated with the changes in the level of protection in low-income regions. Also, the estimated effect is stronger when we focus on industries for which credit card debt is an important source of financing (for example, construction or photography). It is important to point out that these outcome variables are only suggestive evidence of the real effect of the increase on the level of unsecured debt.

Taking all this evidence together, the rise in credit card debt induced by the increase in the level of protection could have led to an increase in small business creation, and a decrease (or no increase) in the delinquency rates of unsecured creditors. The individual results seems to suggest that the channel driving the demand effect is consistent with a large impact from the insurance channel on existing borrowers, as we do not observe increases in the entry rates of new borrowers and ex post delinquencies within our micro level sample. Although this evidence is only suggestive, it highlights the important potential benefits of increasing the level of bankruptcy protection, especially for people in areas on the lower end of the wealth distribution, for which the insurance effect is more significant.

7 Conclusion

Overall, the evidence we present in this paper identifies the causal effect of the increase in the level of protection under personal bankruptcy on household leverage. We show that increases in the level of bankruptcy protection within our sample period, leads to an expansion in the levels of credit card debt that is stronger in counties that are in the lowest tercile of the within state income distribution, and monotonically decreasing as the level of income increases. Using micro level data we find that the expansion is concentrated among existing borrowers. This expansion is also correlated with an increase in small business creation, and seems to have no effect on counties' overall delinquency rates.

These findings highlight the importance role that personal bankruptcy laws play as an insurance mechanism, providing down side protection especially for low-income regions. Therefore, the documented credit increase has important implications for our understanding of personal bankruptcy protection as a risk-sharing improving policy.

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Table 1. Summary Statistics Data

	All Sample N=15,519		Eventually Treated N=7,091		Never Treated N=8,428		
Levels	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	
Debt to Income (DTI)	1.23	0.48	1.29	0.52	1.18	0.45	
Mortgage Debt to Income (MTI)	0.90	0.45	0.97	0.49	0.84	0.41	
Credit Card Debt to Income (CCTI)	0.16	0.04	0.16	0.04	0.17	0.05	
Auto Loan Debt to Income (ATI)	0.17	0.06	0.16	0.06	0.17	0.07	
County Total Debt (bil. USD)	2.89	10.51	3.93	13.95	2.01	6.18	
County Mortgage Debt (bil. USD)	2.33	9.01	3.25	12.08	1.57	5.06	
County Credit Card Debt (bil. USD)	0.29	0.83	0.36	1.03	0.22	0.61	
County Auto Debt (bil. USD)	0.26	0.76	0.32	0.92	0.22	0.60	
Personal Unsecured Int. Rate (bp)	12.8	2.2	12.8	2.2	12.9	2.2	
Credit Card Int. Rate (bp)	13.1	2.7	13.4	2.7	12.8	2.7	*
30 yr Fixed Mortgage Int. Rate (bp)	6.6	0.7	6.6	0.7	6.6	0.7	
Mortgage Delinquency (% of pop)	1.5	1.3	1.5	1.2	1.6	1.3	
Credit Card Deliquency (% of pop)	8.2	3.5	7.8	3.1	8.5	3.8	
Auto Delinquency (% of pop)	2.4	1.5	2.3	1.4	2.4	1.5	
County Household Population	100,306	269,477	123,735	331,573	80,594	200,934	
IRS County Income (bil. USD)	1.90	5.56	2.46	6.85	1.43	4.11	*
Unemployment Rate	5.32	1.90	5.35	1.87	5.30	1.93	
No. of Bankruptcy Filing (1998)	604	2051					
% of Owner Occupancy (2000)	73.35	7.84					
	N=13,302		**N=6,078**		**N=7,224**		
Changes	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	
DTI Change	0.099	0.113	0.101	0.109	0.098	0.116	
MTI Change	0.115	0.149	0.115	0.145	0.115	0.151	
CCTI Change	0.051	0.118	0.053	0.112	0.049	0.124	
ATI Change	0.098	0.156	0.096	0.146	0.101	0.165	
Total Debt Growth	0.122	0.091	0.123	0.089	0.122	0.092	
Mortgage Debt Growth	0.133	0.120	0.133	0.119	0.133	0.120	
Credit Card Debt Growth	0.076	0.099	0.078	0.093	0.075	0.104	
Auto Debt Growth	0.117	0.125	0.115	0.118	0.119	0.130	
Personal Unsecured Int. Rate Change (bp)	-0.09	0.94	-0.12	0.93	-0.06	0.95	
Credit Card Int. Rate Change (bp)	-0.75	1.88	-0.65	1.84	-0.84	1.91	
30-yr Fixed Mortgage Int. Rate Change (bp)	-0.34	0.50	-0.34	0.49	-0.33	0.51	
Income Growth	0.033	0.053	0.032	0.054	0.033	0.052	
Unemployment Rate Change	0.111	0.963	0.115	0.931	0.108	0.989	
House Price Growth	0.075	0.046	0.088	0.050	0.062	0.037	***

Note. "All Sample" refers to all counties in the sample period. "Eventually Treated" refers to counties treated during the sample period, that is, states that changed their level of protection during the sample period. "Never Treated" refers to counties not treated during the sample period. County Debt (in bil. USD) for mortgage, credit card and auto loans, is obtained from the FRBNY Consumer Credit Panel/Equifax. IRS County Income (in bil. USD) is measured as total wages and salary in that county. Debt to Income is constructed using the two county measures described above. Personal unsecured, credit card, and 30-year fixed mortgage rates are constructed from branch-setter level rates from Rate-Watch. Delinquency rates for mortgage, credit card, and auto loans are from the FRBNY Consumer Credit Panel/Equifax, and represent the fraction of households that are 90+ days delinquent. County household population is the number of household per county and year in the FRBNY Consumer Credit Panel/Equifax. No. of Filings is the number of non-business filings in a county in 1998 from the American Court System. % of Owner Occupancy is the percentage of home ownership in a county in 2000 from the Census Bureau. For a complete description of the data sources see section 3.1. Data Description. House price growth is extracted from the Federal Housing Finance Agency (FHFA) House Price Index (HPI) data at a state level. The number of observations refers to the number of county-year observations. Almost all variables are available for every county (2,218), with the exception of interest rates, which are only available for (1232, 1323 and 1340 counties respectively). *, **, and *** denotes significance at the 10%, 5%, and 1% level cluster at the state level for the mean differences between "Eventually Treated" and "Never Treated" sample. The sample period is from 1999 to 2005.

Table 2. Summary Statistics Protection Level

All Sample	**Mean**	**Std. Dev.**	**p5**	**p25**	**p50**	**p75**	**p95**
Protection Level	73,627	75,125	13,000	23,200	55,800	166,200	unlimited
Homestead	63,932	73,356	7,500	20,000	40,000	150,000	unlimited
Personal Assets	9,695	5,965	2,900	5,000	8,400	11,000	25,000
Unlimited States	7						
No. of States	50						
Eventually Treated	**Mean**	**Std. Dev.**	**p5**	**p25**	**p50**	**p75**	**p95**
Protection Level	85,655	86,100	11,000	32,300	51,000	110,300	390,000
Homestead	75,243	84,838	0,000	25,000	40,000	100,000	350,000
Personal Assets	10,411	6,061	3,000	7,200	9,100	11,000	25,000
No. of States	26						
Protection Changes	38,841	52,992	2,000	3,250	15,400	50,000	200,000
No. of Changes	37						
Never Treated	**Mean**	**Std. Dev.**	**p5**	**p25**	**p50**	**p75**	**p95**
Protection Level	56,922	52,366	14,400	20,700	57,700	586,000	unlimited
Homestead	48,222	49,678	10,000	13,750	45,000	575,000	unlimited
Personal Assets	8,700	5,705	2,900	4,800	6,300	12,300	42,000
No. of States	24						

Note. "All Sample" refers to all counties in the sample period. "Eventually Treated" refers to counties treated during the sample period, that is states that changed their level of protection during the sample period. "Never Treated" refers to counties not treated during the sample period. Protection Level is the nominal value of household protection under Chapter 7. Homestead is the amount of home-equity protected under Chapter 7. Personal Assets, is the amount of assets protected under Chapter 7, such as, books, furniture, jewelry, etc. The exact description depends on the state. Unlimited States is the number of states with unlimited home-equity protection during our sample period. Protection Changes is constructed based on the yearly changes in the level of protection. Levels of protection and homestead are different at 10% between "Eventually Treated" and "Never Treated". The sample period is from 1999 to 2005.

Table 3. Effect of Bankruptcy Protection on Debt. Panel A. Credit Card Debt

	Changes									Levels	
	County Linear Trend (1)	**State Linear Trend (2)**	**No Linear Trend (3)**	**Level Controls (4)**	**Level Controls + Inc-Year Uep-Year (5)**	**Eventually Treated (6)**	**Changed Once (7)**	**Change $\geq$ 0.15 (8)**	**Dummy Treatment (9)**	**Level on Level County FE (10)**	**Level on Level State FE (11)**
Protection Growth s,t	0.018**	0.019**	0.018**	0.017**	0.017**	0.017**	0.022**	0.018**	0.012***		
	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)	(0.009)	(0.008)	(0.004)		
Protection Level s,t										0.023**	0.027**
										(0.011)	(0.013)
Unemployment Rate Change	0.002	0.003	0.002	0.000	0.003	0.002	0.002	0.002	0.002		
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)		
House Price Index Growth	-0.102	-0.109	-0.139***	-0.203**	-0.183*	-0.118	-0.049	-0.103	-0.105		
	(0.086)	(0.085)	(0.037)	(0.102)	(0.099)	(0.086)	(0.108)	(0.086)	(0.083)		
Income Growth	0.079*	0.134***	0.142***	0.073*	0.088**	0.138*	0.081	0.079*	0.079*		
	(0.047)	(0.041)	(0.040)	(0.041)	(0.041)	(0.077)	(0.051)	(0.047)	(0.047)		
Unemployment Rate				0.005*	0.002					0.003	0.007*
				(0.003)	(0.003)					(0.003)	(0.004)
House Price				0.083***	0.070**					-0.166***	-0.263***
				(0.031)	(0.029)					(0.042)	(0.053)
Income				0.023	0.010					0.251***	0.951***
				(0.021)	(0.020)					(0.047)	(0.006)
No. of Obs.	13,302	13,302	13,302	13,302	13,302	6,078	11,478	13,302	13,302	15,519	15,519
No. of Clusters	50	50	50	50	50	26	39	50	50	50	50
County FE	Y			Y	Y	Y	Y	Y	Y	Y	
State FE		Y									Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.30	0.29	0.28	0.30	0.31	0.29	0.30	0.30	0.30	0.79	0.98

Notes. This table shows the estimated coefficient following specification (1) of log changes to credit card debt on log changes in bankruptcy protection at the county level. Debt county data is from the FRBNY Consumer Credit Panel/Equifax. Protection Growth is the log change in the level of protection in state s at time t. Protection Level is the level of protection in state s at time t. Unemployment rate change is the change in unemployment rate in county i at time t from BLS. House price growth is the log change in the FHFA state level index for state s at time t, and Income growth is the income log change in county i at time t from IRS. Columns 1 and 2 show the result using county and state fixed effects respectively in the first difference specification. Column 3 shows the results if we exclude state or county fixed effect from specification (1). Column 4 shows the estimates including level of the controls. Column 5 shows the estimates including level controls and income and unemployment groups times year fixed effect, to allow for differential trends across states based on these observable characteristics. Column 6 shows the estimates for a regression that only uses states treated during the sample period, that is, states that changed their level of protection during the sample period. Column 7 shows the results if we only consider as treated state that changed once. Column 8 shows the estimates if we replace by zero changes below 0.15. Column 9 shows results if we replace the change with a dummy indicator that is one if the change is greater than zero. Columns 10 and 11 show the results of regression log levels of credit card debt on log levels of protection and including county and state fixed effect respectively. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 3. Effect of Bankruptcy Protection on Debt. Panel B. Mortgage Debt

	Changes									Levels	
	County Linear Trend (1)	**State Linear Trend (2)**	**No Linear Trend (3)**	**Level Controls (4)**	**Level Controls + Inc-Year Uep-Year (5)**	**Eventually Treated (6)**	**Changed Once (7)**	**Change $\geq$ 0.15 (8)**	**Dummy Treatment (9)**	**Level on Level County FE (10)**	**Level on Level State FE (11)**
Protection Growth s,t	0.011	0.011	0.008	0.005	0.007	0.014	0.013	0.012	0.006		
	(0.012)	(0.012)	(0.015)	(0.010)	(0.010)	(0.014)	(0.013)	(0.012)	(0.007)		
Protection Level s,t										0.007	0.006
										(0.031)	(0.026)
Unemployment Rate Change	-0.004	-0.003	-0.003	-0.004	0.000	-0.001	-0.005*	-0.004	-0.004		
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)		
House Price Index Growth	0.086	0.078	0.044	-0.378**	-0.345**	0.128	0.046	0.086	0.084		
	(0.161)	(0.161)	(0.079)	(0.170)	(0.174)	(0.256)	(0.209)	(0.161)	(0.161)		
Income Growth	0.114	0.185**	0.191**	0.039	0.060	0.208	0.125	0.114	0.114		
	(0.107)	(0.091)	(0.091)	(0.079)	(0.081)	(0.181)	(0.114)	(0.107)	(0.107)		
Unemployment Rate				0.000	-0.004					0.001	-0.055***
				(0.004)	(0.004)					(0.004)	(0.007)
House Price				0.278***	0.265***					0.013	-0.223**
				(0.041)	(0.041)					(0.069)	(0.089)
Income				0.133***	0.105***					0.319***	1.123***
				(0.039)	(0.036)					(0.067)	(0.012)
No. of Obs.	13,302	13,302	13,302	13,302	13,302	6,078	11,478	13,302	13,302	15,519	15,519
No. of Clusters	50	50	50	50	50	26	39	50	50	50	50
County FE	Y			Y	Y	Y	Y	Y	Y	Y	
State FE		Y									Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.09	0.10	0.08	0.11	0.13	0.11	0.09	0.09	0.09	0.86	0.97

Notes. This table shows the estimated coefficient following specification (1) of log changes to mortgage debt on log changes in bankruptcy protection at the county level. Debt county data is from the FRBNY Consumer Credit Panel/Equifax. Protection Growth is the log change in the level of protection in state s at time t. Protection Level is the level of protection in state s at time t. Unemployment rate change is the change in unemployment rate in county i at time t from BLS. House price growth is the log change in the FHFA state level index for state s at time t, and Income growth, is the income log change in county i at time t from IRS. Columns 1 and 2 show the result using county and state fixed effects respectively in the first difference specification. Column 3 shows the results if we exclude state or county fixed effect from specification 1. Column 4 shows the estimates including level of the controls. Column 5 shows the estimates including level controls and income and unemployment groups times year fixed effect, to allow for differential trends across states based on these observable characteristics. Column 6 shows the estimates for a regression that only uses states treated during the sample period, that is, states that changed their level of protection during the sample period. Column 7 shows the results if we only consider as treated state that changed once. Column 8 shows the estimates if we replace by zero changes below 0.15. Column 9 shows results if we replace the change with a dummy indicator that is one if the change is greater than zero. Column 10 and 11, show the results of regression log levels of mortgage debt on log levels of protection and including county and state fixed effect respectively. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively

Table 3. Effect of Bankruptcy Protection on Debt. Panel C. Auto Debt

	Changes									Levels	
	County Linear Trend (1)	**State Linear Trend (2)**	**No Linear Trend (3)**	**Level Controls (4)**	**Level Controls + Inc-Year Uep-Year (5)**	**Eventually Treated (6)**	**Changed Once (7)**	**Change $\geq$ 0.15 (8)**	**Dummy Treatment (9)**	**Level on Level County FE (10)**	**Level on Level State FE (11)**
Protection Growth s,t	0.009	0.009	0.009	0.009	0.013	0.009	0.009	0.010	0.002		
	(0.013)	(0.013)	(0.014)	(0.012)	(0.013)	(0.012)	(0.015)	(0.013)	(0.008)		
Protection Level s,t										0.000	0.007
										(0.024)	(0.027)
Unemployment Rate Change	-0.005*	-0.004	-0.005*	-0.002	-0.005	-0.011***	-0.004	-0.005*	-0.005*		
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)		
House Price Index Growth	-0.005	-0.013	0.107**	-0.104	-0.134	-0.230*	0.049	-0.005	-0.007		
	(0.113)	(0.113)	(0.054)	(0.124)	(0.125)	(0.118)	(0.150)	(0.113)	(0.112)		
Income Growth	0.059	0.124***	0.127***	0.031	0.020	0.121***	0.054	0.059	0.059		
	(0.038)	(0.032)	(0.030)	(0.032)	(0.032)	(0.043)	(0.041)	(0.038)	(0.038)		
Unemployment Rate				-0.011**	-0.009*					-0.005	0.024***
				(0.005)	(0.005)					(0.004)	(0.005)
House Price				0.009	0.033					0.107*	0.061
				(0.043)	(0.045)					(0.055)	(0.069)
Income				0.026	0.029					0.249***	0.928***
				(0.029)	(0.030)					(0.038)	(0.008)
No. of Obs.	13,302	13,302	13,302	13,302	13,302	6,078	11,478	13,302	13,302	15,519	15,519
No. of Clusters	50	50	50	50	50	26	39	50	50	50	50
County FE	Y			Y	Y	Y	Y	Y	Y	Y	
State FE		Y									Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.18	0.19	0.17	0.19	0.19	0.20	0.18	0.18	0.18	0.85	0.97

Notes. This table shows the estimated coefficient following specification (1) of log changes to auto debt on log changes in bankruptcy protection at the county level. Debt county data is from the FRBNY Consumer Credit Panel/Equifax. Protection Growth is the log change in the level of protection in state s at time t. Protection Level is the level of protection in state s at time t. Unemployment rate change is the change in unemployment rate in county i at time t from BLS. House price growth is the log change in the FHFA state level index for state s at time t, and Income growth is the income log change in county i at time t from IRS. Columns 1 and 2 show the result using county and state fixed effects respectively in the first difference specification. Column 3 shows the results if we exclude state or county fixed effect from specification 1. Column 4 shows the estimates including level of the controls. Column 5 shows the estimates including level controls and income and unemployment groups times year fixed effect, to allow for differential trends across states based on these observable characteristics. Column 6 shows the estimates for a regression that only uses states treated during the sample period, that is, states that changed their level of protection during the sample period. Column 7 shows the results if we only consider as treated state that changed once. Column 8 shows the estimates if we replace by zero changes below 0.15. Column 9 shows results if we replace the change with a dummy indicator that is one if the change is greater than zero. Column 10 and 11 show the results of regression log levels of auto debt on log levels of protection and including county and state fixed effect respectively. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 4. Determinants of Bankruptcy Protection Levels and Changes

	Protection Level s,t		Protection Growth s,t		Protection Dummy s,t	
	(1)	(2)	(3)	(4)	(5)	(6)
House Price/Growth s,t	-3.900	-1.837***	-0.809**	-0.537	-0.697	-0.858
	(4.616)	(0.671)	(0.354)	(0.572)	(0.701)	(0.789)
House Price/Growth s,t-1	5.287	2.983***	1.691***	0.970	2.700***	1.806*
	(4.503)	(0.770)	(0.619)	(0.762)	(0.776)	(0.994)
Medical Exp./Growth s,t	-3.332	0.836	-0.316	-1.150	-1.101	-2.380
	(5.359)	(1.001)	(0.644)	(0.821)	(1.270)	(1.834)
Medical Exp./Growth s,t-1	4.635	0.348	-0.537	-1.805*	-1.020	-2.274*
	(5.238)	(1.106)	(0.763)	(1.001)	(1.115)	(1.287)
Unemp. Rate/Change s,t	-0.023	0.028	0.005	0.002	0.027	0.026
	(0.190)	(0.036)	(0.027)	(0.033)	(0.042)	(0.048)
Unemp. Rate/Change s,t-1	0.033	-0.081*	-0.016	-0.008	-0.056	-0.058
	(0.148)	(0.042)	(0.028)	(0.032)	(0.050)	(0.065)
State Real GDP/Growth s,t	3.703	0.504	0.474	1.028	-1.665	-0.911
	(4.464)	(0.871)	(0.668)	(1.018)	(1.034)	(1.343)
State Real GDP/Growth s,t-1	-6.950	-1.448	-0.277	0.425	-1.429	-0.547
	(3.916)	(0.742)	(0.282)	(0.457)	(0.789)	(0.802)
No. Filings/Growth s,t	-0.299*	0.125*	0.030	-0.123	0.060*	-0.114
	(0.250)	(0.039)	(0.045)	(0.098)	(0.069)	(0.098)
No. Filings/Growth s,t-1	-0.482	0.194***	0.053	-0.045	0.026	-0.080
	(0.245)	(0.072)	(0.047)	(0.071)	(0.064)	(0.090)
Political Climate s,t-1	0.045**	-0.289***	0.010	0.400	0.151	0.608
	(1.509)	(0.171)	(0.161)	(0.234)	(0.151)	(0.458)
Personal Income/Growth s,t	15.885*	1.077	1.554	0.996	3.264	3.190
	(8.597)	(1.257)	(1.299)	(1.928)	(2.009)	(2.399)
Personal Income/Growth s,t-1	-13.235*	-0.219*	-0.720	-1.159	-0.525*	-0.893
	(9.202)	(1.206)	(0.929)	(1.477)	(1.849)	(2.200)
No. of Obs.	350	350	300	300	300	300
State FE		Y		Y		Y
Year FE	Y	Y	Y	Y	Y	Y
R2	0.13	0.12	0.07	0.22	0.13	0.25

Note. This table shows the estimated coefficient of regression of bankruptcy protection on contemporaneous and lag values of variables that could determinate the changes in protection levels. House Price s,t is the level or growth of house prices in state s at time t, from FHFA. Medical expenses is the level of growth in state's annual total medical expenses from the National Health Statistic. No. of Filings, is the number or change in the number of filings for non-business bankruptcies in a state. Political Climate s,t is defined as the share of democratic votes in the closer House of Representative election. State GDP and Personal Income are from BEA, and Unemployment Rate from BLS. Columns 1 and 2 show the coefficient of regressions of the protection level on levels of the explanatory variables using only year, and year and state fixed effect. Columns 3 and 4 show the coefficient of regressions of the growth in protection on growth of the explanatory variables using only year, and year and state fixed effect. Columns 5 and 6 show the coefficient of regressions of a dummy that is one if the growth in protection is greater than zero on the explanatory variables growth using only year, and year and state fixed effect. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level.

Table 5. Dynamics of the Change in Protection Levels on Credit Card Debt

	1 Period			2 Periods		
	No Linear Trend (1)	**County Linear Trend (2)**	**County Linear Trend (3)**	**No Linear Trend (4)**	**County Linear Trend (5)**	**County Linear Trend (6)**
Protection Growth s,t-2				0.001	-0.004	-0.005
				(0.019)	(0.026)	(0.025)
Protection Growth s,t-1	-0.008	-0.010	-0.012	-0.007	-0.007	-0.010
	(0.008)	(0.010)	(0.009)	(0.009)	(0.015)	(0.015)
Protection Growth s,t	0.018**	0.019**	0.016**	0.018**	0.022**	0.020**
	(0.007)	(0.008)	(0.007)	(0.007)	(0.009)	(0.008)
Protection Growth s,t+1	0.002	0.006	0.006	0.003	0.010	0.010
	(0.006)	(0.008)	(0.009)	(0.006)	(0.010)	(0.011)
Protection Growth s,t+2				0.010**	0.016***	0.016***
				(0.005)	(0.005)	(0.005)
Unemployment Rate Change	0.002	0.002	0.000	0.002	0.002	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
House Price Index Growth	-0.139***	-0.108	-0.212**	-0.142***	-0.120	-0.229**
	(0.037)	(0.085)	(0.101)	(0.037)	(0.085)	(0.100)
Income Growth	0.143***	0.080*	0.073*	0.143***	0.080*	0.072*
	(0.040)	(0.047)	(0.042)	(0.040)	(0.047)	(0.041)
Unemployment Rate			0.005*			0.004
			(0.003)			(0.003)
House Price			0.085			0.086
			(0.030)			(0.029)
Income			0.024			0.025
			(0.021)			(0.021)
No. of Obs	13,302	13,302	13,302	13,302	13,302	13,302
No. of Clusters	50	50	50	50	50	50
County FE		Y	Y		Y	Y
Year FE	Y	Y	Y	Y	Y	Y
R-Squared	0.28	0.30	0.30	0.28	0.30	0.31

Note. This table shows the estimated coefficient following specification (1) of log changes to credit card debt on log changes in bankruptcy protection at the county level. Debt county data is from the FRBNY Consumer Credit Panel/Equifax. Protection Growth is the log change in the level of protection in state s at time t. Unemployment rate change is the change in unemployment rate in county i at time t from BLS. House price growth is the log change in the FHFA state level index for state s at time t, and Income growth is the log change in income in county i at time t from IRS. Columns 1 and 4 show the without the inclusion of county fixed effects, including one lag and lead, and two lags and two leads. Columns 2 and 5 show the results with the inclusion of county fixed effect for including one lag and lead, and two lags and two leads, Columns 3 and 6 are the same than before but including level controls. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 6. Local Business Conditions. Neighboring County-pairs across State Borders

Panel A. Credit Card Debt

	All County-Pairs		Equal Income County-Pairs		Low Income County-Pairs	
	State Linear Trend (1)	County Liner Trend (2)	State Linear Trend (3)	County Liner Trend (4)	State Linear Trend (5)	County Liner Trend (6)
Protection	-0.006	-0.005	0.015	0.015*	0.099**	0.098**
Growth s,t	(0.011)	(0.011)	(0.010)	(0.009)	(0.046)	(0.044)
Unemployment	0.003**	0.003**	0.002	0.001	0.002*	0.001**
Rate Change	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)	(0.005)
House Price	-0.322**	-0.317**	-0.266	-0.261	-1.040*	-1.037**
Index Growth	(0.157)	(0.154)	(0.178)	(0.171)	(0.550)	(0.526)
Income	0.095***	0.043	0.122*	0.066	0.121	0.102
Growth	(0.024)	(0.027)	(0.071)	(0.075)	(0.125)	(0.122)
No. of Obs	9,168	9,168	3,984	3,984	1,188	1,188
No. of Clusters	48	48	46	46	33	33
County FE		Y		Y		Y
State FE	Y		Y		Y	
County-Pair-Year FE	Y	Y	Y	Y	Y	Y
R-Squared	0.70	0.70	0.67	0.67	0.63	0.62

Panel B. Unemployment, House Prices and Income

	Unemployment		House Prices		Income	
	Equal Income County-Pairs		Equal Income County-Pairs		Equal Income County-Pairs	
	State Linear Trend (1)	County Liner Trend (2)	State Linear Trend (3)	County Liner Trend (4)	State Linear Trend (5)	County Liner Trend (6)
Protection	-0.172	-0.170	0.000	0.005	0.003	0.003
Growth s,t	(0.119)	(0.128)	(0.006)	(0.008)	(0.003)	(0.003)
No. of Obs	3,984	3,984	1,998	1,998	3,984	3,984
No. of States	46	46	41	41	46	46
County FE		Y		Y		Y
State FE	Y		Y		Y	
County-Pair-Year FE/Controls	Y	Y	Y	Y	Y	Y
R-Squared	0.77	0.78	0.91	0.92	0.64	0.70

Note. Panel A shows the estimated coefficient following specification (2) of log changes in credit card debt on log changes in bankruptcy protection at the county level. Debt county data is from the FRBNY Consumer Credit Panel/Equifax. Protection Growth is the log change in the level of protection in state s at time t. Unemployment rate change is the change in unemployment rate in county i at time t from BLS. House price growth is the log change in the FHFA state level index for state s at time t, and Income growth is the log change in income in county i at time t from IRS. Columns 1 and 2, show the estimates for state and county fixed effect for all neighboring county-pairs sample. Columns 3 and 4 show the results including state and county fixed effect for the sub-sample of neighboring county-pairs for which both counties are in the same income bucket. Columns 5 and 6 show estimates with state and county fixed effect for only the neighboring county-pairs in the same income bucket and in the lowest tercile of the income distribution. Panel B shows similar estimates than Panel A, but for change in unemployment rate, columns 1 and 2; log changes in county level house prices from zillow, columns 3 and 4; and log changes in IRS income in columns 5 and 6. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% two cluster at the state and county-pair level respectively.

Table 7. Effect of Bankruptcy Protection on Debt: Cross-sectional Regression

	Total Debt	**Credit Card Debt**	**Mortgage Debt**	**Auto Debt**
	(1)	**(2)**	**(3)**	**(4)**
Protection	-0.018	0.020	-0.046**	0.035
Level s,t	(0.014)	(0.015)	(0.019)	(0.033)
Unemployment	-0.013	0.020***	-0.035**	0.041***
Rate	(0.013)	(0.007)	(0.017)	(0.010)
House Price	0.556***	-0.045	0.854***	-0.396
Index	(0.195)	(0.154)	(0.231)	(0.254)
Income	1.095***	0.969***	1.152***	0.930***
	(0.014)	(0.008)	(0.017)	(0.013)
N of Obs	15,519	15,519	15,519	15,519
N of Clusters	50	50	50	50
Year FE	Y	Y	Y	Y
R-Squared	0.96	0.97	0.95	0.94

Note. This table shows the estimated coefficient of regressing level of debt at the county on level of bankruptcy protection in that county state. Debt county data is from the FRBNY Consumer Credit Panel/Equifax. Protection Level is the level of protection in state s at time t. Unemployment rate is measure in county i at time t from BLS. House price index is the FHFA state level index for state s at time t, and Income in county i at time t is from IRS. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 8. Heterogeneous Treatment of Bankruptcy Protection on Credit Card Debt:

Income and Home ownership

		Low Income		Med Income		High Income	
	Income		Home Ownership		Home Ownership		Home Ownership
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Protection Growth s,t	0.007	0.028**	0.063***	0.020**	0.029	0.006	0.014
	(0.007)	(0.011)	(0.018)	(0.010)	(0.019)	(0.006)	(0.009)
Protection Growth s,t x Low Income	0.022***						
	(0.007)						
Protection Growth s,t x Low Home Ownership			-0.050***		-0.012		-0.011
			(0.018)		(0.025)		(0.009)
Protection Growth s,t x Med Income	0.013**						
	(0.006)						
Protection Growth s,t x Med Home Ownership			-0.049***		-0.014		-0.013
			(0.016)		(0.019)		(0.012)
Unemployment Rate Change	0.003	0.005*	0.005*	0.002	0.002	0.002	0.002
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
House Price Index Growth	-0.109	-0.015	-0.012	-0.099	-0.099	-0.208**	-0.206**
	(0.086)	(0.094)	(0.095)	(0.098)	(0.098)	(0.092)	(0.093)
Income Growth	0.137***	0.059**	0.057*	0.090***	0.088***	0.240***	0.227***
	(0.040)	(0.030)	(0.031)	(0.032)	(0.028)	(0.062)	(0.064)
No. of Obs	13,302	4,536	4,536	4,422	4,422	4,344	4,344
No. of Clusters	50	50	50	50	50	50	50
State and Year FE	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.29	0.24	0.24	0.29	0.30	0.46	0.48

Note. This table shows the estimated coefficient following a variation of specification (1) that incorporates interactions. Low/Med Income represents counties in the lowest/middle tercile of the within state income distribution. Low/Med Ownership represents counties in the lowest/middle tercile of the within income bucket distribution. Column 1 shows the result for the whole sample when interacted with income heterogeneity. Column 2 shows the result of specification (1) restricted to the low income counties. Column 3 shows the within low income heterogeneity in homeownership. Columns 4 to 7 replicates columns 2 and 3 for medium and high income levels. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 9. Effect of Bankruptcy Protection on Interest Rates: Personal Unsecured Loans and Credit Cards

	Personal Unsecured Loan						Credit Card Debt					
			Eventually		County-Pairs				Eventually		County-Pairs	
	St Linear Trend (1)	Cty Linear Trend (2)	Cty Linear Trend (3)	Cty Linear Trend (4)	St Linear Trend (5)	Cty Linear Trend (6)	St Linear Trend (7)	Cty Linear Trend (8)	Cty Linear Trend (9)	Cty Linear Trend (10)	St Linear Trend (11)	Cty Linear Trend (12)
Protection Growth s,t-2				-0.260						0.584		
				(0.395)						(0.464)		
Protection Growth s,t-1				-0.022						0.083		
				(0.274)						(0.677)		
Protection Growth s,t	0.389***	0.415***	0.373**	0.296*	0.755***	0.820***	0.007	0.147	-0.004	0.317	0.875*	0.775
	(0.147)	(0.144)	(0.147)	(0.170)	(0.177)	(0.157)	(0.217)	(0.183)	(0.232)	(0.229)	(0.515)	(0.573)
Protection Growth s,t+1				-0.132						0.308*		
				(0.106)						(0.166)		
Protection Growth s,t+2				-0.286						0.256		
				(0.205)						(0.273)		
Unemployment Rate Change	0.003	0.001	-0.020	-0.009	0.106	0.084	-0.118	-0.103	-0.100	-0.086	-0.038	-0.059
	(0.046)	(0.050)	(0.073)	(0.048)	(0.103)	(0.107)	(0.089)	(0.090)	(0.096)	(0.095)	(0.151)	(0.160)
House Price Index Growth	4.938***	4.812***	4.363**	5.154***	-0.112	1.072	5.179	3.691	2.606	3.625	-5.857	-5.049
	(1.629)	(1.623)	(2.159)	(1.607)	(3.153)	(3.315)	(3.984)	(3.895)	(4.532)	(4.014)	(7.780)	(8.608)
Income Growth	0.198	0.182	0.551	0.203	2.299*	2.904	1.734***	1.886***	1.440	1.864***	-0.224	-0.868
	(0.268)	(0.385)	(0.622)	(0.383)	(1.255)	(1.936)	(0.558)	(0.600)	(0.973)	(0.605)	(4.195)	(4.905)
No. of Obs	4,693	4,693	2,338	4,693	1,621	1,621	5,371	5,371	2,430	5,371	1,621	1,621
No. of Clusters	49	49	25	49	44	44	50	50	26	50	45	45
Cty and Year FE		Y	Y	Y		Y		Y	Y	Y		Y
State and Year FE	Y				Y		Y				Y	
R-Squared	0.17	0.13	0.15	0.14	0.79	0.80	0.29	0.21	0.23	0.21	0.82	0.82

Note. This table shows the estimated coefficient following a variation of specification (1) of changes in interest rates (%) on changes in the level of protection. Personal Unsecured Loan and Credit Card Debt are county averages of the interest rates in a county for each type of credit. Columns 1 and 7 show the result using state fixed effect. Columns 2 and 8 show the estimates using county fixed effect. Columns 3 and 9 show the result restricting the sample to only the "eventually" treated sample. Columns 4 and 10 show the estimates looking at the dynamic effect of changes in protection on interest rates. Colums 5, 6, 11, and 12 show the results including state and county fixed effect for the sub-sample of neighboring county-pairs for which both counties are in the same income bucket. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level or two way cluster at the state and county-pair level respectively.

Table 10. Effect of Bankruptcy Protection on Interest Rates: Mortagage Credit

	3 Yr-ARM			15 Yr-Fixed			30 Yr-Fixed		
	St Linear Trend (1)	**Cty Linear Trend (2)**	**Eventually Cty Linear Trend (3)**	**St Linear Trend (4)**	**Cty Linear Trend (5)**	**Eventually Cty Linear Trend (6)**	**St Linear Trend (7)**	**Cty Linear Trend (8)**	**Eventually Cty Linear Trend (9)**
Protection	0.037	0.053	0.041	0.014	0.019	0.005	0.026	0.029	0.027
Growth s,t	(0.051)	(0.062)	(0.057)	(0.041)	(0.042)	(0.035)	(0.029)	(0.030)	(0.034)
Unemployment	-0.066***	-0.100***	-0.048**	-0.001	-0.002	-0.022	0.001	0.004	-0.040
Rate Change	(0.031)	(0.041)	(0.026)	(0.009)	(0.011)	(0.017)	(0.019)	(0.022)	(0.017)
House Price	2.244***	2.332***	2.690**	0.009	0.045	0.637	-0.039	0.017	0.234
Index Growth	(0.648)	(0.677)	(1.094)	(0.319)	(0.332)	(0.403)	(0.246)	(0.252)	(0.261)
Income	-0.093	-0.191	-0.485	-0.003	-0.005	-0.136	-0.029	-0.034	-0.317***
Growth	(0.228)	(0.290)	(0.374)	(0.085)	(0.118)	(0.111)	(0.107)	(0.139)	(0.115)
No. of Obs	3,919	3,919	1,945	5,723	5,723	2,802	5,533	5,533	2,732
No. of Clusters	47	47	24	50	50	26	49	49	25
Cty and Year FE		Y	Y		Y	Y		Y	Y
State and Year FE	Y			Y			Y		
R-Squared	0.85	0.85	0.85	0.87	0.86	0.87	0.86	0.85	0.87

Note. This table shows the estimated coefficient following a variation of specification (1) of changes in interest rates (%) in the level of protection. 3 Yr-ARM, 15 Yr-Fixed, 30 Yr-Fixed, are county averages of the interest rates in a county for each type of credit. Columns 1, 4, and 7 show the result using state fixed effect. Columns 2, 5 and 8, show the estimates using county fixed effect. Columns 3, 6 and 9, show the result restricting the sample to only the "eventually" treated sample. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 11. Effect of Bankruptcy Protection on Debt, Number of Credit Cards and Entry

Panel A. All individuals all types of debt

	Credit Card Debt	Home Debt	Auto Debt
	Δ in Debt Balance (1)	Δ in Debt Balance (2)	Δ in Debt Balance (3)
Protection	0.076***	0.011	0.019
Growth s,t	(0.009)	(0.011)	(0.016)
N of Obs	366,362	166,792	132,834
N of Clusters	40	38	39
County & Year FE / Controls	Y	Y	Y
R-Squared	0.00	0.01	0.01

Panel B. All individuals credit card debt

		Number of Credit Cards			Entry	
	Δ in Debt Balance (1)	Δ in N Credit Cards (2)	Δ in N Credit Cards Conditional on n>0 (3)	Δ in N Credit Cards Conditional on n>0 & Balance >0 (4)	Open First Credit Card (5)	Credit Card Balance Becomes >0 (6)
Protection	0.076***	0.054***	0.082***	0.093***	0.001	-0.002
Growth s,t	(0.009)	(0.019)	(0.026)	(0.029)	(0.003)	(0.006)
N of Obs	366,362	619,726	454,688	359,235	555,007	221,849
N of Clusters	40	40	40	40	40	39
Cty and Year FE/ Controls	Y	Y	Y	Y	Y	Y
R-Squared	0.00	0.02	0.02	0.02	0.01	0.01

Panel B. Home owners

		Number of Credit Cards			Entry	
	Δ in Debt Balance (1)	Δ in N Credit Cards (2)	Δ in N Credit Cards Conditional on n>0 (3)	Δ in N Credit Cards Conditional on n>0 & Balance >0 (4)	Open First Credit Card (5)	Credit Card Balance Becomes >0 (6)
Protection	0.102***	0.081***	0.103***	0.115***	-0.002	-0.006
Growth s,t	(0.014)	(0.020)	(0.024)	(0.032)	(0.003)	(0.006)
N of Obs	210,863	304,005	248,955	205,458	291,353	103,854
N of Clusters	39	39	39	39	39	37
Cty and Year FE/ Controls	Y	Y	Y	Y	Y	Y
R-Squared	0.00	0.02	0.02	0.02	0.01	0.01

Note. This table shows the estimated coefficient following a variation of specification (1). Panel A, replicates results from Table 3, but using indivuals in counties below the median income, the dependet variable is changes in individual debt holdings. Credit card estimates in column 1 is statistically different from estimates for home debt and auto debt, column 2 and 3. Panel B uses all individuals in counties below the median income. Panel B restricts the sample to homeowners, defined as individuals for whom some home debt is observed during the sample period. Column 1 shows the estimated of log changes in individuals' credit card balance on log changes in the levels of bankruptcy protection. Column 2 shows the estimates of the effect of personal bankruptcy protection on the number of credit cards changes. Column 3 restricted the previous specification to borrowers with more than 0 credit card. Column 4 shows the estimates for individual with more than 0 credit cards and a positive balance. Column 5 shows the estimates for a linear probability model on the timing of opening the first card, in this case the dependent variable is one if the individual did not have a credit card at t-1, but has one at t. Column 6 shows the same linear probability model estimates, but defining entry based on the timing of going to a positive balance, in other words the variable is one if the individual did not have a positive balance at t-1 but has one at t. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Table 12. Effect of Bankruptcy Protection on Credit Card Delinquency

Panel A. All individuals

	90+ days				120+ days				Severe			
	t	t+1	t+2	t+3	t	t+1	t+2	t+3	t	t+1	t+2	t+3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Protection	-0.001	-0.008**	0.000	0.004	-0.002	-0.009**	-0.001	0.003	-0.003	-0.008**	0.001	0.002
Growth s,t	(0.004)	(0.004)	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.002)	(0.002)
N of Obs	366,362	363,498	361,444	359,783	366,362	363,498	361,444	359,783	366,362	363,498	361,444	359,783
N of Clusters	40	40	40	40	40	40	40	40	40	40	40	40
Cty and Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Uep/Income/HP Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01

Panel B. Interaction Home owners and Non-Home owners

	90+ days				120+ days				Severe			
	t	t+1	t+2	t+3	t	t+1	t+2	t+3	t	t+1	t+2	t+3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Protection	0.017*	0.013	0.022***	0.019**	0.014	0.012*	0.019***	0.017*	0.005	0.011*	0.020***	0.013
Growth s,t	(0.010)	(0.008)	(0.006)	(0.008)	(0.010)	(0.007)	(0.007)	(0.010)	(0.007)	(0.006)	(0.006)	(0.008)
Protection	-0.029**	-0.035***	-0.035***	-0.023**	-0.026**	-0.033***	-0.032**	-0.022*	-0.013	-0.029***	-0.031***	-0.018
Growth s,t x Home Ownership	(0.013)	(0.012)	(0.012)	(0.010)	(0.012)	(0.011)	(0.013)	(0.012)	(0.010)	(0.011)	(0.011)	(0.011)
N of Obs	366,362	363,498	361,444	359,783	366,362	363,498	361,444	359,783	366,362	363,498	361,444	359,783
N of Clusters	40	40	40	40	40	40	40	40	40	40	40	40
Cty and Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Uep/Income/HP Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.03	0.02	0.02	0.01	0.03	0.03	0.02	0.01	0.03	0.03	0.02	0.02

Note. This table shows the estimated coefficient following a variation of specification (1), where we replace the dependent variable for a dummy indicator that is equal to 1 if the person is delinquent at the specified time. Panel A uses all individuals in counties below the median income with a positive balance. Panel B interacts the treatment effect with a dummy that is one if the individual is a homeowners, defined as individuals for whom some home debt is observed during the sample period. Columns 1 to 4 show the estimates where delinquency is defined as being delinquent 90 days or more. Column 5 to 8 show the estimates where delinquency is defined as being delinquent 120 days or more. Columns 9 to 12 show the estimates where delinquency is defined as being severely delinquent. All regressions include controls. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively

Table 13. Effect of Bankruptcy Protection on Self-Employment

	Self Employment			Credit Card Startup > p50		Credit Card Startup < p50	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Protection Gowth s,t	0.000	-0.003	-0.010**	-0.002	-0.014	-0.003	-0.007
	(0.002)	(0.003)	(0.004)	(0.007)	(0.009)	(0.002)	(0.003)
Protection Gowth s,t		0.006**	0.012***		0.024***		0.005
x Low Income		(0.003)	(0.004)		(0.007)		(0.004)
Protection Gowth s,t		0.003	0.008***		0.012**		0.006
x Med Income		(0.002)	(0.003)		(0.005)		(0.003)
Unemployment	0.001***	0.001***	0.001***	0.001	0.001	0.001	0.001
Rate Change	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
House Price	0.096***	0.097***	0.058**	0.057	0.056	0.059*	0.059
Index Growth	(0.023)	(0.022)	(0.028)	(0.035)	(0.035)	(0.033)	(0.033)
Income	0.063***	0.063***	0.101***	0.126***	0.127***	0.085***	0.085
Growth	(0.010)	(0.009)	(0.028)	(0.037)	(0.037)	(0.025)	(0.025)
Number of Observations	12,738	12,738	194,011	73,081	73,081	120,930	120,930
Number of Clusters	50	50	50	50	50	50	50
State FE	Y	Y					
State x 2-digit industry			Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.21	0.23	0.01	0.02	0.02	0.02	0.02

This table shows the estimated coefficient following a variation of specification (1) of log changes in self-employment measures on log changes in the levels of protection. Column 1 shows the estimates for county self-employment aggregates. Column 2 shows the results for the effect interacted with income heterogeneity for aggregate self-employment. Column 3 shows the estimates interacted with low income using self-employment changes by industry and county. Column 4 and 5 show the estimates for industries that used the level of credit card debt as a start-up capital and Column 6 and 7 for industries that do not. The sample period is from 1999 to 2005. *, **, and *** denotes significance at the 10%, 5%, and 1% cluster at the state level respectively.

Figure 1. Debt Growth and Bankruptcy Filings

This figure plots the yearly number of non-business filings in the US from 1994 until 2012 extracted from the Statistics Division of the Administrative Office of the United States Courts, and the adjusted total revolving debt in the US extracted from the Federal Reserve Board of Governors Consumer Credit Report.

Figure 2. States that Changed their Level of Bankruptcy Protection

This figure shows in dark the counties that were at some point treated between 1999 and 2005; "eventually" treated, in other words the level of bankruptcy protection changed at some point during that period. Lightly colored counties are the counties in which the level never changed, "never" treated. Counties in gray represent counties for which FRBNY Consumer Credit Panel/Equifax did not provide information because their population was below 10,000 households during our sample period.

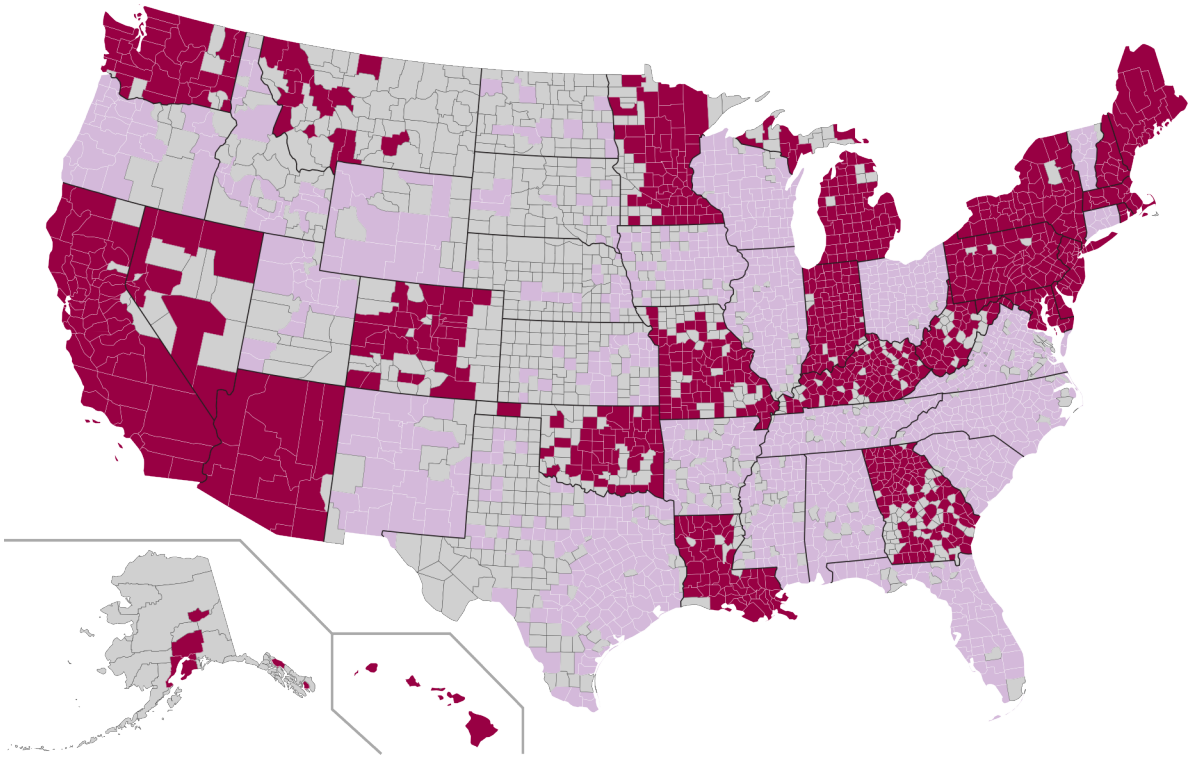


Figure 3. Ilustration of Different Demand and Supply Responses

This figure uses supply and demand curves to illustrate possible net effects. Baseline Equilibrium is the initial equilibrium before the change. Increase in Price, No Increase in Q, show the effect when the supply response totally and perfectly upsets the demand increase. Increase in Price, Decrease in Q, show the effect when the supply response is stronger than the demand increase. Increase in Price, Increase in Q, show the effect when the demand effect dominates.

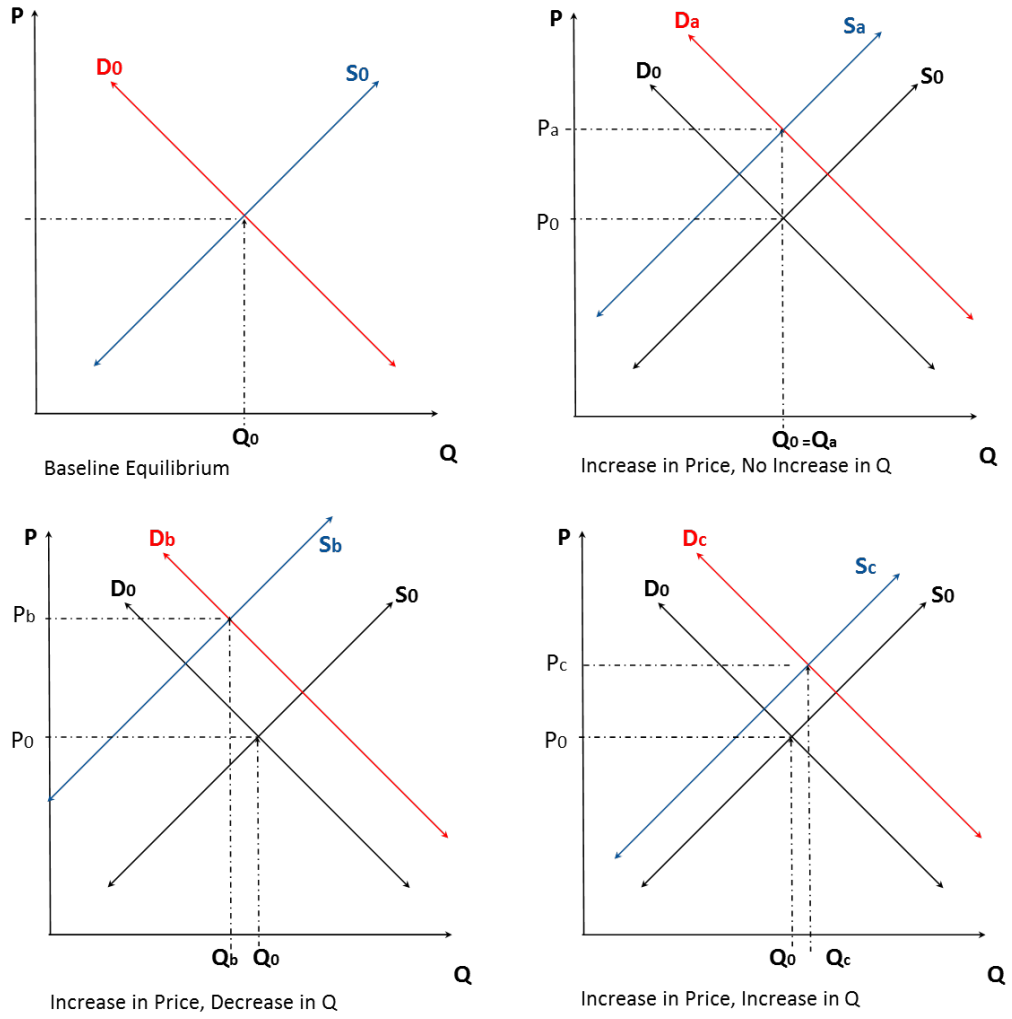
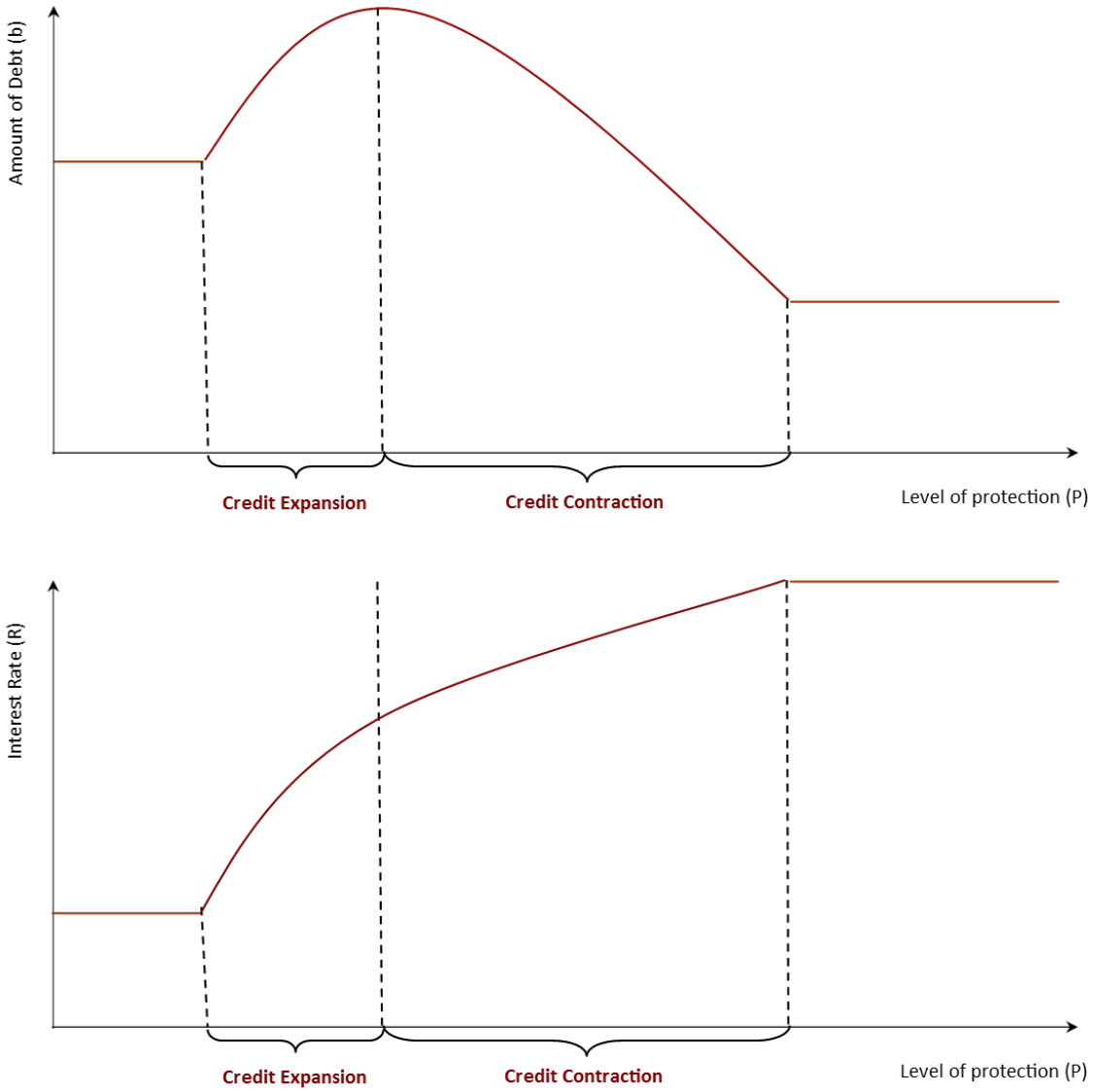


Figure 4. Ilustration of a solution of the model

This figure shows a stylized, schematic solution of the path obtained by solving numerically the model in Appendix A; the top figure shows the relationship between the debt amount and protection levels. The bottom figure shows the relationship between price and protection levels.



Appendix A. Model of Effect of Bankruptcy Protection on Household Borrowing

To explore the previous explanation, gain further insights into the effects of changes in the bankruptcy reforms on the supply of credit, and to guide the empirical analysis, we provide a simple model of the credit market where we abstract from considering the moral hazard and adverse selection behavior of borrowers. In our model, we highlight the effect of the increase of partial insurance provided by bankruptcy protection in the credit market equilibrium outcome, and how even in the absence of asymmetric information we could observe a demand effect.

We do this using a two period model, where the agent needs to borrow in order to consume at period 1. Formally, the agent will consume c_o at t=0 and $c_1(s)$ at t=1, where $s \in \{B, G\}$ (good and bad states in t=1), with the correspondent probability $\{p, 1-p\}$

The agent is endowed with a wealth only at t=1, his wealth is a combination of home equity H (exogenous), and income y. For simplicity, assume that income follows a binomial distribution given by $y(G) = W > 0$ and $y(B) = 0$. Exists a level of protection P (exogenously determinate)

The agent's consumption will be given by

$$c_0 = b$$

$$c_1 = y + H - Min\{(1+R)b, y + Max(H-P, 0)\}$$

where R is endogenously determined

Agent's Maximization Problem

Given this setup, the agent will solve the following problem

$$V(b) \quad = \quad Max \;\; u(c_0) + \beta E[u(c_1)]$$

Subject to the consumption above. Therefore, the agent's consumption in period 2 will be given by:

- No default, total repayment: $c_1 = y + H - (1+R)b$
- Default and home-equity is not fully protected $(H-P) > 0$: $c_1 = P$
- Default and home-equity is fully protected $(H-P) < 0$: $c_1 = H$

Bank's break even condition

It is given by

$$(1+r)b = E[Min\{(1+R)b, y + Max(H-P, 0)\}]$$

where r is the risk free rate (exogenous). The payoff for the bank are given by:

- No default, total repayment: $b(1+R)$
- Default and home-equity is not fully protected: $y + H - P$
- Default and home-equity is fully protected: y

Consider a risk-averse agent, $u(x) = ln(x)$, the solution of the problem above defines three regions as a function of the level of protection. Figure 4 illustrate the shape of the numerical solution using the following set of parameters $r = 0.05$, $\beta = 0.925$, $p = 0.5$, $W = 5k$.

Fixed borrowing (between $0, \underline{P}$): There is no default; banks lend at a risk-free rate and the borrower demands a fixed quantity not related to the level of protection.

Increase in borrowing (between $\underline{P}, P^*$): There is a probability of default greater than zero, interest rates go up, but quantities go up too. The agent's marginal utility of consumption at t = 0 is greater than the marginal cost in the good state, conditional on the level of protection on the bad state, that ensure a given level of consumption.

Decrease in borrowing (between $P^*, \overline{P}$): The probability of default increases, and interest rates go up even more. Agents will decrease the equilibrium amount of debt with respect to the previous region, and the marginal cost in the good state overcomes the benefit of consumption today, given the level of protection in the bad state.