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The Credit Card Act and Consumer Finance Company Lending

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Federal Reserve Board

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Abstract

The Credit Card Accountability and Disclosure Act (CARD Act) of 2009 restricted several risk management practices of credit card issuers. Using a quasi-experimental design with credit bureau data on consumer lending, we find evidence consistent with the hypothesis that the act's restrictions on risk management practices contributed to a large decline in bank card holding by higher risk, nonprime consumers but had little effect on prime consumers. Looking at consumer finance loans, historically a source of credit for higher risk consumers, we find greater reliance on such loans by nonprime consumers in states with high consumer finance rate ceilings following the CARD Act than by nonprime consumers in states with low rate ceilings or by prime consumers. That nonprime consumers in states with high consumer finance rate ceilings relied more heavily on consumer finance loans suggests that consumer finance loans were a substitute for subprime credit cards for risky consumers when rate ceilings permit such loans to be profitable. Consumer finance loans would not be available to many higher risk, nonprime consumers in low rate states because such loans would be unprofitable, and prime consumers would not need consumer finance loans because other, less expensive types of credit would generally be available to them.

Keywords: credit supply, credit cards, CARD Act, subprime credit, consumer credit, personal loans, household finance

JEL categories: G21, G23, G28

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I. Introduction

In the years following their introduction, bank credit cards expanded from a niche product held mostly by higher income individuals to the most widely used credit product in the United States. By the beginning of the 21st century, bank credit cards were available to even many of the riskiest of individuals.[2] About seven in ten individuals in the bottom quartile of credit bureau scores held bank credit cards in 2001 (Canner and Elliehausen 2013). Contributing to this development was credit card companies' adoption of risk-based pricing, which enabled companies to discourage risky behavior and raise additional revenue or limit losses when customers engaged in risky behavior (Furletti 2003).[3]

In this environment, new Federal Reserve regulations and the Credit Card Accountability, Responsibility and Disclosure Act (the CARD Act) of 2009 mandated significant disclosure and substantive requirements for credit cards. Among the substantive requirements were restrictions on practices that credit card companies used to manage risk. These restrictions prompted credit card companies to raise prices, reduce credit limits, and limit availability of credit card loans to riskier individuals (Canner and Elliehausen 2013). Reductions in the availability of credit card loans may have stimulated demand for finance company loans, historically an important source for small amounts of unsecured credit for riskier consumers (National Commission on Consumer Finance 1972). This paper examines some material consequences of the regulatory and legislative actions on the quantity and sources of credit used by different types of households. Specifically, we focus on identifying changes in availability of credit card credit and possible substitution of consumer finance company loans for bank credit card debt by risky borrowers following implementation of the CARD Act.

The CARD Act's restrictions on risk-based penalty pricing, late payment fees, over-the-limit fees, and initial and periodic fees weakened tools that helped credit card companies extend

[2] Overall, bank card holding increased from 16 percent of households in 1970 to 70 percent of households in 2007. A large share of lower income households also became bank card holders. Among households in the lowest income quintile, bank card holding increased from 2 percent in 1970 to 38 percent in 2007. Source: Survey of Consumer Finances, authors' calculations.

[3] Also, Brito and Hartley (1995) observed that relatively high fixed costs of origination and servicing loan provided lenders an incentive to use open-end credit rather than closed-end credit for making small loans. This incentive led over time to an increase in credit card lending and a decline in small closed-end finance company loans (Durkin et al. 2014, chapters 5 and 7).

credit to riskier consumers. As a result of these changes, the act appears to have reduced availability of bank card credit to risky consumers. By 2010, after the CARD Act had become effective, bank credit card holding by risky consumers had fallen from seven in ten to a little more than one-half of consumers in the bottom quartile of the credit bureau scores (Canner and Elliehausen 2013).[4]

Using credit bureau data, we examine consumers' holding of bank card accounts and non-auto, non-student closed-end finance company loans (hereafter referred to simply as "consumer finance loans") of prime and nonprime consumers for states with low and high rate ceilings for the consumer finance company loans. We compare use of these types of credit for each of the credit risk/rate ceiling groups before passage of the act, during the implementation period (which included the 2007-2009 recession), and after the regulation implementing the act became effective. Consideration of credit risk and state rate ceilings for consumer finance loans helps distinguish between changes in bank card accounts due to the CARD Act and those due to other factors. We expect that the act's effect on nonprime consumers is greater than that on prime consumers and that consumer finance loans are more readily available to higher risk nonprime consumers in states with high rate ceilings than states with low rate ceilings.

Our findings suggest first that the CARD Act reduced credit availability for higher risk consumers and that some higher risk consumers used consumer finance loans as a substitute for credit card debt. First, we observed that the number of credit card accounts declined substantially in the implementation period for both nonprime and prime consumers. The number of credit card accounts declined further for nonprime but not prime consumers after the CARD Act became effective. While some part of the declines may be attributed to deleveraging due to the recession, larger further declines for nonprime customers in the post-law period suggests that the CARD Act's restrictions on risk management practices may have adversely affected availability of credit card debt for higher risk consumers more than others.

Second, nonprime consumers in states with high rate ceilings for consumer finance loans used relatively more consumer finance loans than either prime consumers or nonprime consumers

[4] Financial difficulties caused by the severe 2007-2009 recession undoubtedly contributed to the decline in card holding. However, the decline in the percentage of card holders in lowest credit bureau score quartile continued after the recession ended and in spite of sharply falling post-recession bank card delinquency rates (Canner and Elliehausen 2013).

in low-rate states. Prime consumers had fewer consumer finance loans than nonprime consumers because prime consumers' low risk made prime consumers more likely to have lower rate alternatives to consumer finance loans, including bank credit cards. Nonprime consumers in low-rate states had fewer consumer finance loans because low rate ceilings made such loans unavailable to riskier nonprime consumer finance loans.

The remainder of this paper is organized as follows: Section II discusses risk management practices of card issuers, provisions of the CARD Act affecting these practices, and evidence on effects of the act. Section III presents the research design and our hypotheses. Section IV presents results of the empirical analysis. Section V summarizes our findings.

II. Risk Management Practices and the CARD Act

Retail credit cards offering financing for a short-period of time (commonly, a month) have existed since the early 20th century, and the travel and entertainment card that could be used at more than one place first appeared in 1950 (Mandell 1972). However, it was the bank card, introduced in 1958, that became the most successful type of credit card.[5] The bank card's innovation was a revolving credit feature, which allowed consumers to pay balances over time and charged interest on unpaid balances. Credit standards for bank cards were stringent throughout the 1960s, and high inflation and high interest rates in the 1970s caused state interest rate ceilings for credit cards to be restrictive. Restricted in most states by interest rate ceilings, bank credit cards were limited to a small percentage of mostly low-risk, high-income consumers (Ellis 1998; Durkin et al. 2014, chapter 11).

The Supreme Court's *Marquette* decision in 1978, which allowed national banks to charge any price in compliance with the laws of the state in which the bank is located regardless of where the customer is located, enabled credit card companies to expand their offerings to higher risk consumers (Ellis 1998; Durkin et al., chapter 11). Credit card companies moved to states with high or no credit card rate ceilings. Not only were credit card companies able to assess consumers' credit risk and initially charge them a premium for that risk on initial offerings, companies were also able after card issuance to increase premiums or charge fees when consumers' risk increased.

[5] For a historical account of the introduction of bank credit cards, see Nocera (1994).

This development facilitated an expansion of credit card debt to higher risk consumers (Furletti 2003).[6]

Risk Management Practices

The CARD Act restricted several practices that credit card companies used to manage risk, including risk-based penalty pricing, charging substantial late and over-the-limit fees, and high initial and recurring fees on deep subprime accounts.[7]

Risk-Based Penalty Pricing. Risk-based penalty pricing is a practice that raises the interest rate on an account when the consumer's behavior on the account suggests that credit risk has increased. Triggers for raising the interest rate included late payments, exceeding the credit limit, returned checks on payments, or a combination of such actions. For example, risk-based penalty pricing might be triggered by either two payments 5 days late within a period of time (such as a year) or a returned check on a payment.

Triggers invoked risk-based penalty pricing far sooner than 30 days past due. According to industry sources, such triggers generated greater interest income but also resulted in lower default losses. The higher interest rate apparently provided a stimulus to the consumer to take actions to avoid default, specifically by reducing new charges and pay down balances more quickly, thereby reducing default risk. That the higher interest rate stimulated faster repayment is consistent with research on credit card customers' sensitivity to interest rates. Analyzing a large panel of monthly activity of individual credit card accounts of several large companies, Gross and Souleles (2002) found that account holders responded to interest rate increases by reducing new charges and paying down balances on the account. Their database also contained information from

[6] A widespread adoption of risk-based pricing is reflected in the growth in late fees in the late 1990s. Average late fees doubled (from $13 to $27) between 1996 and 2001, but annual late fee revenue quadrupled (from $1.7 to $7.3 billion) during this period (Furletti 2003). The much greater than proportionate increase in late fee revenue suggests a substantial increase in late fee incidence. As the economy was in an expansion for all but the last year of this period, much of the growth in late fee revenue can be attributed to an increase in availability of credit cards to higher risk consumers.

[7] The CARD Act included additional requirements not related to risk management including rules for standardizing the calculation of interest charges, notification of changes in account terms, issuance of accounts to persons under 21 years of age, disclosures on certain effects of making only minimum payments, and time to make payments. See Koppel, Ibbotson, and Lee (2009) for a summary of the act's requirements.

credit bureau files showing that customers reduced balances on all accounts, not just the one receiving a rate increase. Credit card companies' experience on the effects of risk-based penalty are consistent with Gross and Souleles's findings.

Late and Over-the-Limit Fees. Credit card companies typically also charged steep late and over-the-limit fees. Evidence indicates that these penalty fees are positively related to the riskiness of banks' credit card portfolios (Massoud, Saunders, and Scholnick 2011). Late fees help compensate for additional collection costs on risky loans. High rates of utilization of credit limits and especially exceeding credit limits are associated with elevated default risk. Credit limits set ceilings on potential default losses, and over-the-limit fees provide additional revenue to offset losses associated with risky behavior. In addition to covering lenders' costs, steep fees discourage risky behavior by making such behavior costly to the consumer. Evidence supporting an incentive effect from penalty fees is a finding is that consumers who become aware of late and over-the-limit fees by incurring them substantially reduce payments of these fees in subsequent years (Agarwal, Driscoll, Gabiax, and Laibson 2008). In other words, awareness of late and over-the-limit fees stimulates consumers' efforts to avoid risky behavior in the future.

Initial and Periodic Fees on Subprime Credit Cards. Subprime credit cards have been marketed to consumers with low credit bureau scores or no credit history. Some subprime card programs have targeted deep subprime consumers. Experience of several subprime credit card companies indicates that about a third of deep subprime credit card customers defaulted within two years of account opening, and all or a large percentage of balances were charged off on these accounts (Turner and Walker 2008). Another third were chronically delinquent and required considerable and frequent collection efforts. Many of the remaining customers substantially improved their credit scores by an economically significant amount over a two-year period. Customers who improved their credit scores often obtained prime credit cards and closed their subprime accounts to avoid the annual and monthly fees charged for subprime accounts.

Deep subprime credit cards had initial low credit limits, commonly in the range of $300 to $500. Low limits help limit default losses. Losses often were further limited by a large, one-time initial fee, which provided revenue to cover origination expenses and losses of accounts that defaulted. In addition, high monthly and annual fees compensated for high collection costs on chronically delinquent accounts. Deep subprime accounts did not rely on particularly high interest

rates to compensate for risk. The amount of interest income generated on low-balance accounts was insufficient to cover the costs of default and delinquency. Sharply higher rates than the rates actually charged would still have been insufficient to cover these costs.

The CARD Act

The Credit Card Accountability, Responsibility, and Disclosure Act (CARD Act) was enacted in May 2009, shortly after the Federal Reserve Board approved new disclosure rules and restrictions on practices for credit card accounts in December of the previous year. The act codified the Federal Reserve's actions and added additional restrictions. The CARD Act was implemented in stages and went into full effect in August 2010. Congress intended the CARD Act to improve disclosure of account terms and conditions to consumers. Congress also restricted card issuer practices that it deemed to be unfair, deceptive, or not sufficiently transparent. Among the provisions of the act were restrictions on certain risk-management practices by card issuers. One provision limited card issuers' ability to raise the interest rate on an outstanding balance unless the account payments were significantly in arrears or the interest rate on the account is a variable rate tied to an index.[8] This provision restricted risk-based penalty pricing. Other provisions affecting risk management practices limited penalty fees for making late payments or exceeding credit limits and restricted the initial and periodic fees to a percentage of the credit limit. The latter provision affected deep subprime credit card programs, which charged relatively large fees and had low credit limits.

Each of these provisions of the act can be expected to lower revenues or reduce the effectiveness of measures intended to prevent expenses arising from risky behavior. In response, card issuers could alter the prices and terms offered on credit cards, the size of credit lines made available to cardholders, and the availability of their products. These issuer responses likely would affect nonprime consumers' credit card accounts more than prime consumers' accounts. Reduced availability of credit cards may have caused riskier consumers to substitute other types of credit

[8] The act requires issuers to notify customers of any increase in the interest rate or changes in other account terms at least 45 days before the change becomes effective. The act prohibits increases in interest rates for existing balances (except as mentioned, increases based on changes in an index for a variable rate or increases arising from expiry of a promotional period). The latter provision limits risk based penalty pricing to new balances. In such cases, customers have the right to pay existing balances at the old rate and close the account. For a summary of CARD Act requirements, see http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR00627:@@@R.

for credit cards, in particular consumer finance loans for subprime credit cards restricted by the CARD Act. Such substitution is especially likely for consumers in states with high consumer finance rate ceilings, which allow consumer finance companies to lend profitably to higher risk consumers.

Effects of the CARD Act

Previous evidence on effects of the CARD Act is mixed. Jambulati and Stavins (2014) investigated effects of the act using credit bureau and consumer survey data. They found an acceleration in account closures after the Federal Reserve Board adopted its credit card amendments and a tightening in terms of credit card accounts between the date on which the CARD Act was signed and the effective date of the rules implementing the act. The findings suggest that issuers began to adjust their card programs in anticipation of the rules taking effect.[9] Jambulati and Stavins noted that the adoption of the Federal Reserve's amendments and the passage of the CARD Act occurred during a recession, making it difficult to identify whether effects were due to the recession or the act.

Agarwal et al. (2015) examined account level data collected by the Office of the Comptroller of the Currency from the nine largest bank card issuers. Their difference in differences analysis used small business accounts for the comparison group. The prelaw period ran from April 2008 through January 2010, a period that included the recession (December 2007 through June 2009) and adoption of the Federal Reserve Board's credit card amendments (December 2008). Their post-law period then reflects three phases in implementation: (1) an anticipation phase from passage of the CARD Act in May 2009 to the phase two implementation date in February 2010; (2), a partial implementation period from March 2010 to the final implementation date in August 2010; and (3) a full compliance period beginning in September 2010, when issuers must comply with all provisions of the act. They did not find that nonprime consumer accounts incurred lower fees relative to small business accounts in the partial

[9] Issuers may have taken actions in anticipation of restriction even before adoption of the Federal Reserve Board's credit card amendments. Chairman Bernanke testified before Congress in February 2008 that the Board would propose amendments, and the Board issued the proposed amendments in May 2008. The Board approved the amendments in December that year.

implementation and full compliance periods than in the two prior periods. They also found little evidence that interest charges increased or that credit limits or average daily balances declined on consumer accounts in any of the post-law periods relative to small business accounts.

That the recession and the Federal Reserve's amendments occurred during the pre-law period also complicates attribution of Agarwal et al.'s estimated effects to the CARD Act. Issuer actions in the pre-law period may have been in response to the recession or to regulation. Card issuers likely would increase interest rates or reduce credit limits as soon the restrictions were known (in this case at least when the Federal Reserve adopted its credit card amendments). Further, the comparison group is intended to help identify the separate effects, but the effectiveness of their small business account comparison group in separating the act's effects from other effects depends on the extent to which small business and consumer accounts are similar except for being subject to the act. A Federal Reserve Board report to Congress on small business credit cards found both similarities and differences in consumer and small business accounts, which raises concern about the effectiveness of the comparison group (Federal Reserve Board 2010).[10]

Han, Keys, and Li (2015) examined credit card solicitations, which are commonly regarded as an indicator of credit supply, over three periods: (1) pre-recession; (2) post-recession and pre-CARD Act, which included the recession; and (2) post-CARD Act. In the pre-recession period, the likelihood of receiving an offer was high, for both prime and subprime consumers. The likelihood of receiving an offer declined for all consumers in the post-recession and pre-CARD Act period, but the decline was larger for higher risk consumers than for lower risk consumers. Eight months into the recovery and after the CARD Act became effective, solicitations of lower risk consumers had recovered to nearly pre-recession levels. However, for higher risk consumers, the likelihood of receiving an offer remained at recession levels in the post-CARD Act period. They concluded: "The recent credit cycle had an enormous impact on the volume of credit offers,

[10] The Federal Reserve report indicates that small business card programs require specialized management and underwriting techniques to manage the particular risks that small businesses present. Small business programs have higher credit limits than consumer accounts to facilitate the higher spending needs of small businesses and offer various ancillary business services. Issuing and servicing costs are higher and loss rates are 20 to 30 percent higher for small business accounts than for consumer accounts. Despite these differences, some issuers run their small business plans within the same business unit as their consumer accounts because the fee and price structures and many other terms are similar for both types of accounts. The report states that some issuers have elected to comply voluntarily with certain substantive restrictions of the Truth in Lending Act as amended by the CARD Act but that other issuers are not required and did not choose to comply with the act.

which peaked at nearly 2 billion per quarter in 2007 and fell by a factor of four by mid-2008. We find that subprime offers were prevalent during the peak years of credit expansion, but that this segment of the market contracted most sharply during the recession. The CARD Act appears to have only further exacerbated market tightening for risky households (Han, Keys, and Li 2015, p. 34)."

III. Research Design, Data, and Hypotheses

We use a quasi-experimental design involving pre-law, implementation, and post-law effective period observations of bank credit card debt and closed-end debt held by finance companies. Our treatment group consists of nonprime consumers (credit bureau scores less than 680), and our comparison group consists of prime consumers (credit bureau scores 680 or higher).[11] The substantive restrictions on risk management practices likely would have a significantly larger negative effect on risky nonprime consumers than less risky prime consumers. Nonprime consumers' payment history and credit utilization are associated with elevated levels of default risk. In contrast, prime consumers generally do not make late payments or engage in other types of risky behavior and would therefore be largely unaffected by card issuers risk management practices.[12] As such, prime consumers provide a good comparison group for identifying effects of the CARD Act's restrictions on risk management practices.

Dependent variables are number of bank card accounts and number of consumer finance loans outstanding. Bankcards consist of revolving accounts at banks, credit card companies, savings institutions, and credit unions. Consumer finance loans consist in large part of closed-end cash loans from finance companies but also includes some sales finance credit.[13] For purposes

[11] Credit bureau scores are derived from statistical models that predict the risk of default (serious delinquency, bankruptcy, or other major derogatory events) over the next two years based on information in credit bureau reports (Avery, Calem, and Canner 2004). Credit bureau scores, which range from 280 to 850 for the Equifax score used for this paper, rank order consumers on the basis of predicted risk, with higher scores indicating lower risk. Scoring models are updated regularly and redeveloped periodically to ensure that they remain robust predictors of risk.

[12] Nonprime consumers, especially those with subprime scores (less than 620), expose lenders to high levels of default risk. According to one credit score developer, more than half of consumers with subprime scores are likely to default in the next two years (reported in Avery, Calem, and Canner 2004). In contrast, prime consumers pose little risk to lenders. Fewer than five percent of consumers with prime scores are likely default on a debt payment in the next two years.

[13] Sales finance credit consists of instalment purchase contracts originated with retailers and purchased by lenders. Historically sales finance consisted of closed-end credit to finance acquisition of automobiles, appliances, furniture,

here, finance companies are non-depository firms that report to a credit bureau and whose primary is providing credit or lease financing.[14]

A further factor that helps identify effects of the CARD Act is the height of the state rate ceiling for consumer finance loans. State small loan laws typically specify interest rate ceilings and regulate non-rate terms of closed-end cash loans originated by consumer finance companies operating in the state.[15] The rate ceilings vary from state to state. Consumer finance companies in states with higher rate ceilings can profitably offer small loans to risky consumers, whereas consumer finance companies in states with lower rate ceilings often cannot (National Commission on Consumer Finances 1972; Durkin et al. 2014, chapters 5 and 11). Consumer finance companies in states with low rate ceilings make relatively few but larger loans to low-risk consumers. Thus, substitution of closed-end finance company debt for credit card debt by risky nonprime consumers is more likely to be possible in states with high rate ceilings than states with low rate ceilings. Prime consumers likely would not use large amounts of closed-end finance company debt; and because of their low risk, prime consumers' use of such credit likely would not be affected by the height of the state rate ceiling.

States with high rate ceilings are South Carolina, Georgia, Texas, Oklahoma, Louisiana, Tennessee, Missouri, Illinois, New Mexico, Kentucky, Alabama, Wisconsin, Indiana, Mississippi, and Idaho. Survey evidence shows that finance companies operating in these states have large loan volumes and offer small loans to riskier consumers (see Durkin, Elliehausen, and Hwang 2016).

Following the timing of the Federal Reserve amendments and the CARD Act, we focus our analysis on three periods—prelaw, rule and law implementation, and law fully effective (table 1). As mentioned, the Federal Reserve Board approved credit card amendments to Regulation Z

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or home improvements. Today, sales finance is still a major source of auto credit, but bank cards finance the acquisition of many non-auto consumer durables. For discussion, see Durkin et al. (2014), chapter 1.

[14] Non-depository lenders that do not report to credit bureaus include payday loan companies, auto title lenders, and pawn shops.

[15] Most states have enacted small loan laws to enable provision of small cash loans to consumers. These laws authorize higher rates for small cash loans to consumers (in the range of 24 to 42 percent, for example) than rates allowed by state usury ceilings (mostly less than 10 percent). Small loan laws require lenders to obtain licenses from the states and include provisions for enforcement. Higher rate ceilings generally allow lenders to offer smaller loans and make credit available to higher risk consumers than lower rate ceilings. For discussion, see Durkin et al. (2014, chapter 11).

(which implements Truth in Lending) and Regulation AA (which implements the Unfair or Deceptive Acts or Practices Rule) that restricted credit card companies' risk management practices on December 18, 2008. The amendments contained the exact restrictions and requirements with which card issuers would have to comply. The CARD Act, signed into law on May 22, 2009 codified Federal Reserve's amendments and added further restrictions but with a deferred effective date. The provisions of the CARD Act were then implemented in three phases, with a final implementation date of August 22, 2010. Accordingly, the prelaw period ends with the fourth quarter of 2008 when the Federal Reserve Board approved the credit card amendments, and the effective period begins with the fourth quarter of 2010 when all provisions of the CARD Act were in effect. Prelaw, implementation, and effective periods are each seven quarters in length.

Table 1: Analysis time periods

Period	Beginning quarter	Ending quarter
Prelaw	Second quarter 2007	Fourth quarter 2008
Implementation	First quarter 2009	Third quarter 2010
Effective	Fourth quarter 2010	Second quarter 2012

The before/after comparison group research design provides considerable protection against rival explanations for results in quasi-experimental analyses (Phillips and Calder 1979, Philips and Calder 1980). Nevertheless, we considered the possibility that prelaw trends in account holding differed due to nonrandom assignment of consumers to treatment and comparison groups, which could bias our analysis. Prelaw trends in account holding for prime and nonprime consumers were similar in both low and high-rate states (see appendix charts). We also considered the possibility that the severity of the recession differed between low and high-rate states. We found differences in unemployment rates between low and high-rate states during the recession to be negligible and not statistically significant. These results do not support rival explanations based on prelaw trends or differences in the severity of the recession.

Data

Data are from the Federal Reserve Bank of New York's quarterly Consumer Credit Panel (CCP), a database on individuals' credit use and payment performance drawn from Equifax credit bureau records. The sample is representative of the target population of credit users in each quarter.[16] The dataset contains individual-level data on virtually every debt owed by each individual, including the type of credit, type of lender, origination date, account balance, scheduled monthly payments, and delinquencies, and adverse events associated with credit accounts. The dataset also contains limited information on individual characteristics, notably year of birth and credit bureau score.

At the end of the fourth quarter of 2008, the quarter in which the Federal Reserve approved the credit card rules, the CCP totaled about 215 million individuals, holding about $871 billion in credit card debt and $128 billion in consumer finance loans.[17] By numbers of accounts, 137 million individuals held 468 million credit card accounts, and 43 million individuals had 128 million consumer finance accounts. Prime consumers held more than 70 percent of the credit card accounts and owed over 60 percent of credit card balances. Prime consumers had 52 percent of consumer finance accounts but owed just 32 percent of consumer finance balances.

Hypotheses

As mentioned, we expect that prime consumers' holding of bank cards would be little affected by the restrictions on risk-management practices in the CARD Act. In contrast card issuers would respond to the act by reducing their exposure to risk from nonprime accounts. Because of their low risk, prime consumers would be less likely to have a consumer finance account than nonprime consumers. Nonprime consumers in low-rate states would be less likely to have consumer finance

[16] The sampling procedure ensures that the same individuals remain in the sample in each quarter and allows for entry and exit into the sample, so that the sample is representative of the target population in each quarter. Seven percent of individuals in the CCP sample did not have a credit score during our analysis period because they had little or no history of credit use, 78.5 percent had credit scores and were present in all periods, and the remaining 11.6 percent had credit scores and either entered or left the sample sometime during the analysis period. See Lee and van der Klaauw (2010) for a description of the design and content of the CCP. See also https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/data_dictionary_HHDC.pdf.

[17] Individual observations are adjusted to eliminate double counting of joint accounts and ensure consistent reporting of open accounts. The data used for this analysis are a one-percent sample of the population of individuals in Equifax's credit reporting files.

loans than nonprime consumers in high-rate states because low-rate ceilings make such loans to riskier consumers unprofitable.

These considerations suggest several specific hypotheses:

1. Nonprime bank card accounts in the effective period would not differ between low and high-rate states for consumer finance company loans.
2. Prime bank card accounts in the effective period would not differ between low and high-rate states for consumer finance company loans.
3. In the prelaw and effective periods, the difference between nonprime bank card accounts in prelaw and effective periods would be greater than the difference between prime bank accounts in both low and high-rate states.
4. In the prelaw and effective periods, nonprime consumer finance loans would be less frequent in low-rate states than in high-rate states.
5. Prime consumer finance loans would not differ between low and high-rate states.

IV. Empirical Analysis and Results

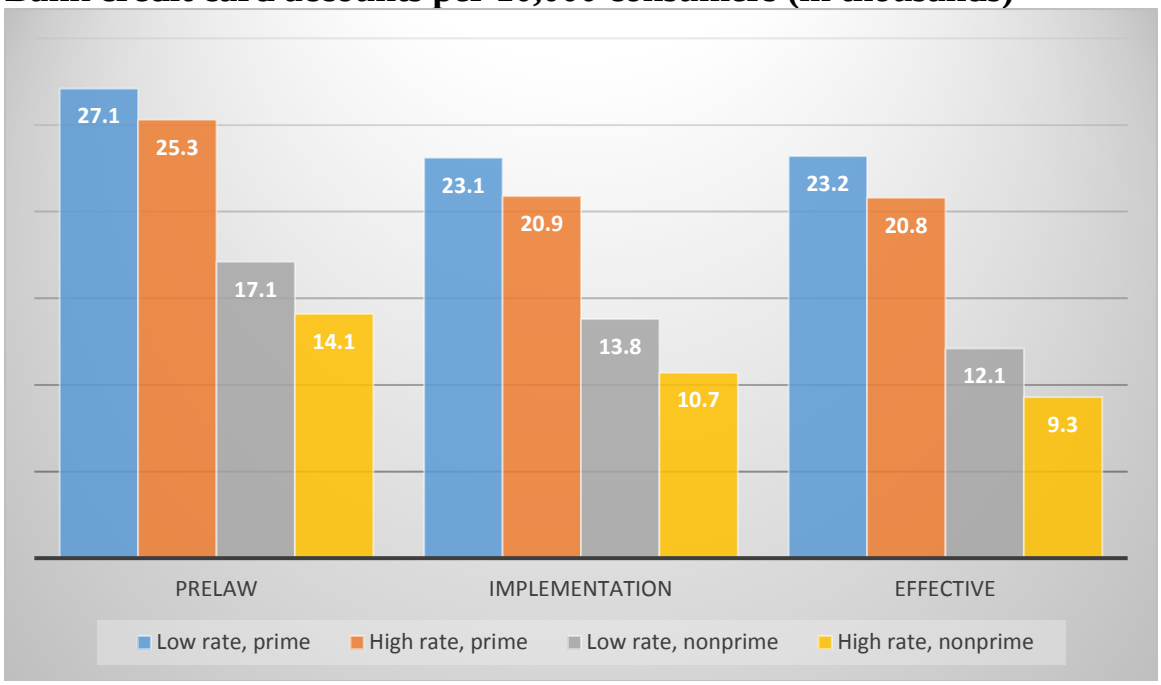
To identify possible effects of the CARD Act, we compare the average aggregate number of consumer finance loans and bank card accounts per 10,000 consumers by credit score category (prime and nonprime) and height of the state consumer finance rate ceiling (with high and low) in the each of the three time periods (prelaw, implementation, and effective).[18] In addition, we use a regression analysis to estimate differences in individuals' bank card holding and consumer finance loan use in prelaw, implementation, and effective periods. Again, we consider differences for creditworthiness and state consumer rate ceilings and also account for income and life cycle stage, characteristics that influence demand for consumer credit.

Aggregate Number of Bank Card and Consumer Finance Accounts

[18] By far most individuals did not experience a change in average credit score over the three periods of analysis. Of individuals with credit histories, 72 percent were present in all three periods and experienced no change in average score, and 7 percent were present in two periods and experienced no change. Sixty percent of individuals present in three periods and 44 percent of individuals present in two periods were prime consumers.

Looking at the number of bank cards per 10,000 consumers (figure 1), we find that prime consumers had more bank card accounts per 10,000 consumers in the prelaw period (25.3 and 27.1 thousand) in both high and low-rate states than nonprime consumers (14.1 and 17.1 thousand). The difference in bank card holding by prime and nonprime consumers likely is attributable to credit risk. Prime consumers generally receive more offers of credit at more attractive terms than subprime consumers.

Figure 1
Bank credit card accounts per 10,000 consumers (in thousands)

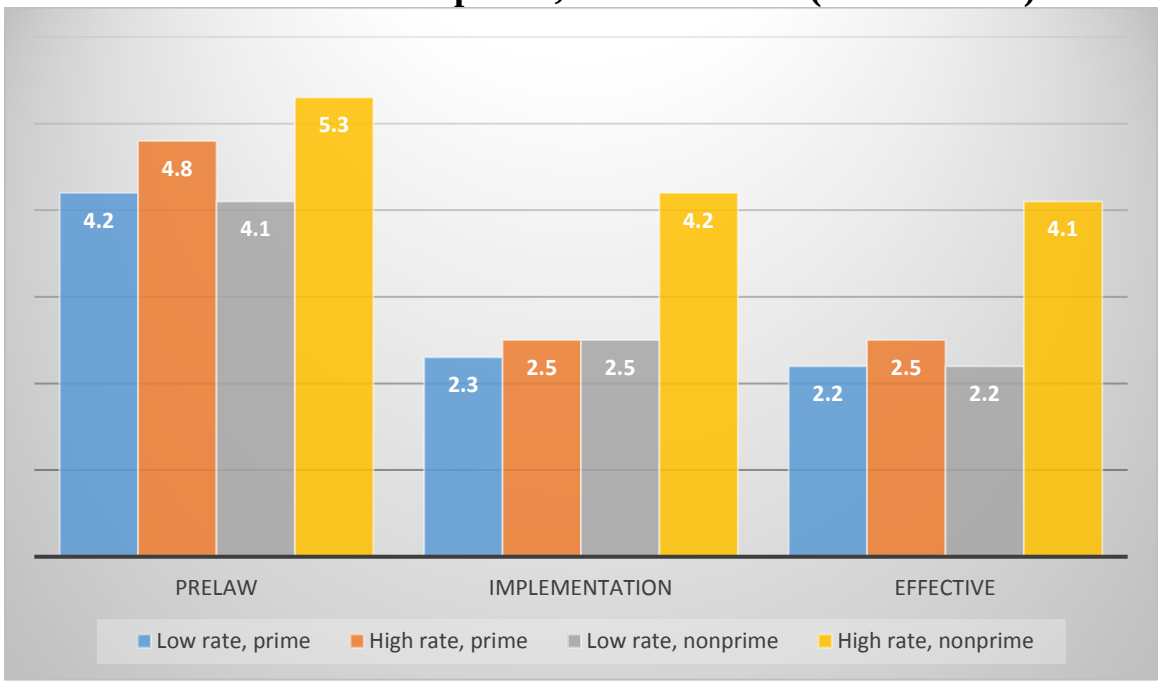


The number of bank cards per 10,000 consumers declined significantly in all groups during the implementation period. The number of prime accounts fell by about four thousand per 10,000 consumers during the implementation period, while the number of nonprime accounts fell by about three thousand per 10,000 consumers. The declines during the implementation period can reasonably be attributed to both the recession and implementation of the Credit Card Act. The recession actually began during the prelaw period and continued into the implementation period (December 2007 through June 2009). As suggested by Jambulapati and Stavins (2014), lenders were unlikely to wait until the effective date to make changes, especially when the changes involved re-pricing or reducing exposure to risk on risky accounts during a recessionary period.

Bank card holding did not recover to prelaw levels in the effective period despite the recovery from the recession that began in the third quarter of 2009, five quarters before the beginning of the effective period. Prime card holding held steady at the implementation period level into the effective period, and nonprime card holding fell a bit further from the implementation period into the effective period.

Next, we consider the number of consumer finance accounts per 10,000 consumers (figure 2). In the prelaw period, nonprime consumers in high consumer finance rate states had the largest number of consumer finance accounts in the prelaw period (5,300 per 10,000 consumers). Nonprime consumers in low-rate states had about 4,100 accounts per 10,000. As discussed above, this difference likely is a consequence of reduced availability of consumer finance loans in these states due to low rate ceilings. Prime consumers had about 4,200 per 10,000 people in low-rate states and 4,800 per 10,000 people in high-rate states. This result likely reflects lower demand, as consumer finance loans are relatively expensive and lower cost alternatives are generally available to prime consumers.

Figure 2
Consumer finance accounts per 10,000 consumers (in thousands)



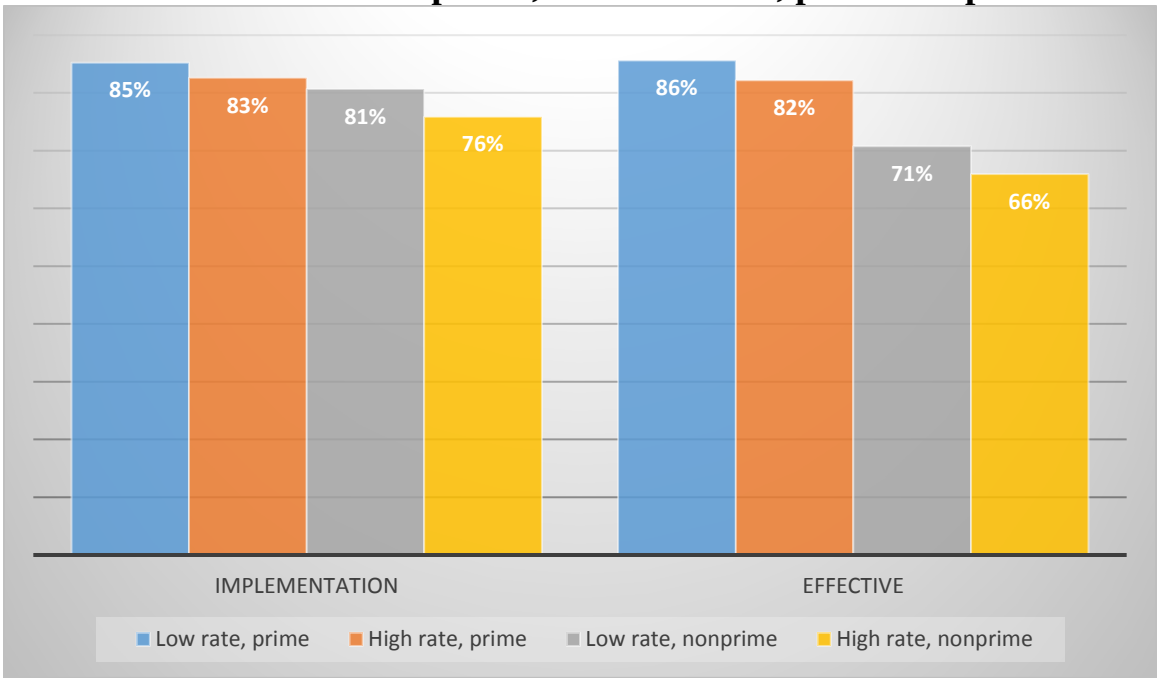
All groups had fewer consumer finance accounts in the implementation and effective periods, in large part reflecting household deleveraging that began during the recession and

continued into the recovery. Notably nonprime consumers in high-rate states had more consumer finance accounts than nonprime consumers in low-rate states. This difference can be attributed to greater availability of consumer finance loans in high-rate states than in low-rate states.

By accounting for differences in initial account holding, the number of accounts relative to the prelaw period provides further perspective on effects of the recession and the Credit Card Act. First, declines in the relative number of bank card accounts during the implementation period were substantial for both nonprime and prime groups. Bank card holding in the implementation period was 76 and 81 percent of prelaw levels for nonprime consumers in high and low-rate states, respectively, and 83 or 85 percent of prelaw levels for prime consumers in high and low-rate states (figure 3). That the difference between nonprime and prime groups in this period, which included the recession, was so small suggests that much of the decline can be attributed to the recession.

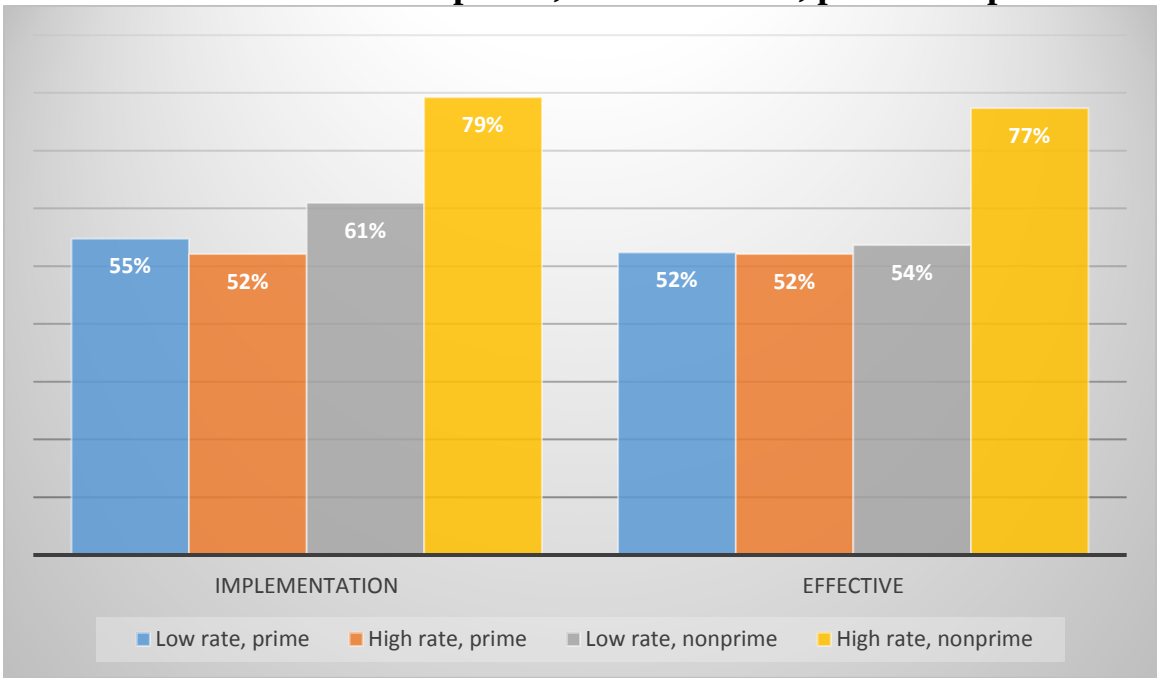
But, the relative number of bank card accounts for nonprime consumers declined further in the effective period to 66 or 71 percent of prelaw levels. In contrast, bank card accounts for prime consumers remained nearly the same in the effective period (82 or 86 percent of prelaw levels) as the implementation period. As the Credit Card Act restricted risk management practices, the post-law decline in nonprime but not prime accounts may be at least in part due to the act.

Figure 3
Bank credit card accounts per 10,000 consumers, percent of prelaw average



The number of consumer finance accounts of prime consumers declined to about half of prelaw levels in the implementation period and remained at that level in the post-law period. This change can be attributed to deleveraging prompted by the recession. Rate ceilings did not matter because prime consumers' lower risk made them unlikely to be rationed.

Figure 4
Consumer finance accounts per 10,000 consumers, percent of prelaw average



The relative number of consumer finance accounts of nonprime consumers also declined during the implementation period, again likely due to the recession. The decline was smaller for nonprime consumers in high-rate states (79 percent of the prelaw level) than in low-rate states (61 percent), consistent with low rate ceilings restricting availability of credit to higher risk consumers. Despite further small declines in nonprime consumers' consumer finance accounts in the post-law period, nonprime consumers continued to rely more heavily on consumer finance credit than prime consumers. That nonprime consumers relied more heavily on consumer finance loans—particularly nonprime consumers in high-rate states—suggests that higher risk consumers may have substituted consumer finance loans for subprime credit cards in the wake of the Credit Card Act.

Accounts per Consumer

In this analysis, we further estimate effects of the CARD Act on the number of bank card accounts (BC) or consumer finance loans (CF) of individual consumers, holding other variables constant (table 2). As in our analysis of aggregate accounts, we compare number of accounts by risk category (nonprime [N] or prime [P]) and state consumer finance rate ceiling category (low rate

[L] and high rate [H]) in prelaw (P), implementation (I), and effective (E) periods. Risk category, rate ceiling category, and time period are indicated by dummy variables. Comparisons are relative to prime consumers in high consumer finance rate ceiling states in the prelaw period (PHP). We account also for effects of income and age on the number of accounts the consumer holds. Consumer credit use generally increases with income and decreases with age, reflecting the ability to service debt and life-cycle considerations (Durkin et al. 2014, chapter 2). Consumers' age is from the credit bureau database. Other than age, credit bureau files do not contain non-credit related information on consumers. We use per capita personal income for the state in which the consumer resides. We also include the unemployment rate for the metropolitan area in which the individual resides (or state for individuals not living in a metropolitan area). Income and unemployment reflects broad influences on consumers' immediate economic circumstances.

Because the number of bank card accounts and number of consumer finance loans are counts (that is, non-negative integers), we assume that the dependent variable has a negative binomial distribution.[19] We estimate negative binomial regressions and include fixed effects for each quarter to account for macroeconomic conditions (table 3). All estimated coefficients are statistically significantly different from zero. We convert the dummy variables estimating effects of the CARD Act on nonprime and prime consumers in high and low-rate states to percentage differences relative to prelaw prime accounts in high consumer finance rate ceiling states. The percentage difference in the dependent variable due to a dummy variable equaling one rather than zero is $\exp(\beta) - 1$, where β is the coefficient of the dummy variable (see Cameron et al. 1988).

[19] Negative binomial models were used by Hausman, Hall, and Griliches (1984) for investigating the effect of research and development expenditures determinants of the number of patents filed by firms; and by Cameron et al. (1988) for investigating the influence of health insurance choice on the use of specific medical services. The negative binomial model is less restrictive than the Poisson model, which assumes independence of events over time and equality of the conditional mean and variance of the dependent variable.

Table 2
Variable definitions and descriptive statistics

		Mean	Standard deviation
Dependent variables			
BC	Number of bank card accounts	1.95	2.14
CF	Number of consumer finance loans	0.321	0.711
Explanatory variables			
NLE	Nonprime, low rate, effective period	0.089	0.285
NHE	Nonprime, high rate, effective period	0.049	0.215
PLE	Prime, low rate, effective period	0.138	0.345
PHE	Prime, high rate, effective period	0.057	0.231
NLI	Nonprime, low rate, implementation period	0.090	0.286
NHI	Nonprime, high rate, implementation period	0.049	0.215
PLI	Prime, low rate, implementation period	0.139	0.346
PHI	Prime, high rate, implementation period	0.057	0.231
NLP	Nonprime, low rate, prelaw period	0.089	0.285
NHP	Nonprime, high rate, prelaw period	0.049	0.216
PLP	Prime, low rate, prelaw period	0.139	0.346
PHP	Prime, high rate, prelaw period (omitted)	0.056	0.229
INC	Income (logarithm)	10.6	0.260
INC2	Income squared	112	5.550
AGE<25	Age less than 25 years, dummy variable	0.077	0.266
AGE25-39	Age 25 to 39 years, dummy variable	0.259	0.438
AGE40-54	Age 45 to 54 years, dummy variable (omitted)	0.294	0.456
AGE≥55	Age 55 years or older, dummy variable	0.370	0.483
UNEMP	Unemployment rate	0.078	0.027

Table 3
Regression results

		Bank card accounts	Consumer finance loans
NLE	Nonprime, low rate, effective period	-0.841	-1.17
		(0.016)	(0.045)
NHE	Nonprime, low rate, effective period	-0.961	-0.347
		(0.007)	(0.012)
PLE	Prime, low rate, effective period	-0.265	-1.14
		(0.015)	(0.045)
PHE	Prime, high rate, effective period	-0.238	-0.825
		(0.006)	(0.013)
NLI	Nonprime, low rate, implementation period	-0.729	-1.11
		(0.016)	(0.045)
NHI	Nonprime, high rate, implementation period	-0.837	-0.395
		(0.008)	(0.013)
PLI	Prime, low rate, implementation period	-0.295	-1.22
		(0.016)	(0.045)
PHI	Prime, high rate, implementation period	-0.253	-0.89
		(0.007)	(0.013)
NLP	Nonprime, low rate, prelaw period	-0.44	-0.388
		(0.015)	(0.044)
NHP	Nonprime, high rate, prelaw period	-0.496	0.0987
		(0.005)	(0.008)
PLP	Prime, low rate, prelaw period	-0.0756	-0.375
		(0.015)	(0.044)
UNEMP	Unemployment rate	0.189	0.969
		(0.065)	(0.126)
INC	Income (logarithm)	4.71	3.17
		(0.132)	(0.278)
INC2	Income squared	-0.208	-0.161
		(0.006)	(0.013)
AGE<25	Age less than 25 years	-0.757	-1.12
		(0.003)	(0.008)
AGE25-39	Age 25 to 39 years	-0.231	-0.265
		(0.002)	(0.004)
AGE>=55	Age 55 years or older	-0.0823	-0.3
		(0.002)	(0.004)
Constant		-25.5	-16.2
		(0.709)	(1.485)

Log L	-3,993,977.7	-1,549,720.4
Chi-square	237,963	94,374
Observations	2,190,044	2,190,044

Bank card accounts. The regression results show that nonprime consumers had fewer bank card accounts (-39 percent in high-rate and -36 percent in low rate states) in the prelaw period than prime consumers in high-rate states (table 4). The difference between prime consumers' holdings in low and high-rate states bank card holding was much smaller (7 percent).

Table 4
Percentage difference in number of bank card accounts and consumer finance loans relative to number of prelaw prime accounts in high consumer finance rate ceiling states

		Bank card accounts	Consumer finance loans
NLE	Nonprime, low rate, effective period	-57	-69
NHE	Nonprime, high rate, effective period	-62	-29
PLE	Prime, low rate, effective period	-23	-68
PHE	Prime, high rate, effective period	-21	-56
NLI	Nonprime, low rate, implementation period	-52	-67
NHI	Nonprime, high rate, implementation period	-57	-33
PLI	Prime, low rate, implementation period	-26	-70
PHI	Prime, high rate, implementation period	-22	-59
NLP	Nonprime, low rate, prelaw period	-36	-32
NHP	Nonprime, high rate, prelaw period	-39	10
PLP	Prime, low rate, prelaw period	-7	-31

Declines in the number of bank card accounts during the implementation period were substantial for both nonprime and prime consumers. Declines were greater for nonprime consumers (-57 percent and -52 percent in high- and low-rate states, respectively) than for prime consumers (-22 percent and -26 percent in high- and low-rate states, respectively).

Nonprime consumers' bank card holding declined further in the effective period (5 percentage points from -57 to -62 in high-rate states and from -52 to -57 in low-rate states). Prime consumers' bank card holding in the effective period was very little changed from the implementation period. That nonprime consumers' holdings declined further despite the

recovery from the recession suggests that the CARD Act's restrictions on risk management practices continued to dampen bank card availability to riskier consumers.

Consumer finance loans. Results for consumer finance loans reflect the negative effect of low rate ceilings on credit availability. Nonprime consumers in high-rate states had 10 percent more consumer finance accounts than prime consumers in high-rate states. The number of consumer finance loans for nonprime consumers in low-rate states differed by 32 percent from that for prime consumers in high-rate states. The difference in consumer finance lending to nonprime borrowers in high and low-rate states can be attributed to lenders rationing credit to higher risk consumers when low rate ceilings make loans to risky loans unprofitable. Prime borrowers had fewer (-31 percent) consumer finance loans in low-rate states than consumers in high-rate states. Apparently low rate ceilings also constrain lending to prime consumers in some states.

The number of consumer finance loans owed by prime consumers fell to more than half that of in the implementation period, which included the recession, and the number of consumer finance loans owed by nonprime consumers fell by 67 percent relative to that of prime consumers in the prelaw period. In contrast, the number of consumer finance loans owed by nonprime consumers in high-rate states changed less (-33 percent) in the implementation period. Estimated effects for the effective period are similar to those for the implementation period. That nonprime consumers in low-rate states experienced large declines in the number of both bank card accounts and consumer finance loans following the CARD Act but nonprime borrowers experienced large declines in bank card accounts but not consumer finance loans suggests that higher risk consumers may have been able to substitute consumer finance credit for reduced access to bank card credit when consumer finance rate ceilings did not restrict availability of such credit.

V. Conclusion

The CARD Act of 2009 mandated significant disclosure and substantive requirements for credit cards. Among the substantive requirements were restrictions on practices that credit card companies used to manage risk. These restrictions prompted credit card companies to raise prices, reduce credit limits, and limit availability of credit cards to riskier individuals. Reductions in the availability of credit card debt likely stimulated demand for closed-end finance company loans, historically an important source for small amounts of unsecured credit for riskier consumers.

Using Equifax credit bureau data, we found that the CARD Act likely reduced availability of bank card credit for higher risk consumers and that some higher risk consumers appear to have used closed-end finance company loans as a substitute. Substitution of consumer finance loans for subprime credit cards is not without cost, however. Credit cards are generally less expensive than closed-end loans for small amounts of credit (Brito, and Hartley 1995). Consumer finance loans typically have higher interest rates than bank cards, especially in high rate ceiling states (Durkin, Elliehausen and Hwang 2016).

Specifically, we found that the number of credit card accounts declined significantly during the CARD Act implementation period for both nonprime and prime consumers, but that the decline for nonprime consumers was more than that for prime consumers. We then showed that credit card accounts declined further for nonprime but not prime consumers after the CARD Act became effective. Part of the declines observed can be attributed to deleveraging related to the recession, but the larger further declines for nonprime customers likely were caused by the CARD Act's restrictions on risk management practices, which adversely affected higher risk consumers.

Second, we found that nonprime consumers in states with high consumer finance rate ceilings used relatively more consumer finance loans than either prime consumers or nonprime consumers in low-rate states. Prime consumers had fewer consumer finance loans than nonprime consumers because prime consumers' low risk made them less likely to be constrained by regulation. Nonprime consumers in low-rate states had fewer consumer finance loans because low rate ceilings made such loans unprofitable. These results suggest that the reduction in bank card availability may have prompted consumers to substitute consumer finance credit for bank card credit in states in which consumer finance credit is available.

While interest and fees paid by consumers exhibiting risky behavior are restricted by the CARD Act, the reduction in credit availability implied by the large decline in bank accounts of nonprime consumers and the limited use of consumer finance accounts by nonprime consumers in low-rate states have negative consequences for many consumers. Using the investment/intertemporal consumption model developed by Fisher (1930) and Hirschleifer (1958), Juster and Shay (1964) demonstrated that availability of additional (unsecured) credit at higher rates may enable consumers to achieve greater levels of utility-increasing household investment. Consumers who might benefit from additional credit are young, have growing families, and whose

relatively low discretionary income and liquid assets constrain their ability to finance household investment. As Juster and Shay explained, "… the restraints on consumer ability to incur debt and the rate at which debt must be liquidated have the practical consequences that many—perhaps most—credit-using households would prefer a higher (average) debt level than they actually have, given the finance rate on their outstanding debt. … It should be recognized that, in principle, consumers can maintain debt at a higher average level than permitted by the customary repayment period if they are willing to borrow supplementary funds from lenders requiring no collateral; in this way the net repayment schedule can be adjusted to any desired rate (p. 12)." Bank credit cards and consumer finance loans are major sources for unsecured credit. Thus, the reduction in credit card accounts for nonprime consumers attributable to the CARD Act would reduce these consumers' ability to finance household investment, which may be utility increasing.[20] And as mentioned, nonprime consumers in high-rate states that use consumer finance loans would pay higher interest rates for supplemental credit than they otherwise might have paid when using bank cards.

Furthermore, the reduction in credit availability does not imply that the incidence or severity of financial distress is any less. Addressing the relationship between credit availability and financial distress, the National Commission on Consumer Finance (1972) concluded: "In spite of growth in consumer credit, … [data do not] indicate a dangerous situation in overindebtedness. Although a small portion of consumers resort to bankruptcy each year, most consumers appear to be able and willing to meet their obligations (p. 21)." This conclusion appears to be still valid. Recent evidence indicates that households generally have adequate resources to service their debts and does not support a conclusion that growth in debt increases bankruptcy filings (Maki 2002; Durkin et al. 2014, chapters 2 and 13).

[20] The high positive correlation between growth in consumer expenditures on durables and consumer credit supports a conclusion that consumer credit is primarily used to finance acquisition of durables. If consumer credit were used mostly to maintain spending in difficult times, then one would expect consumer credit growth to be strong when the economy slows. For discussion, see Maki (2002).

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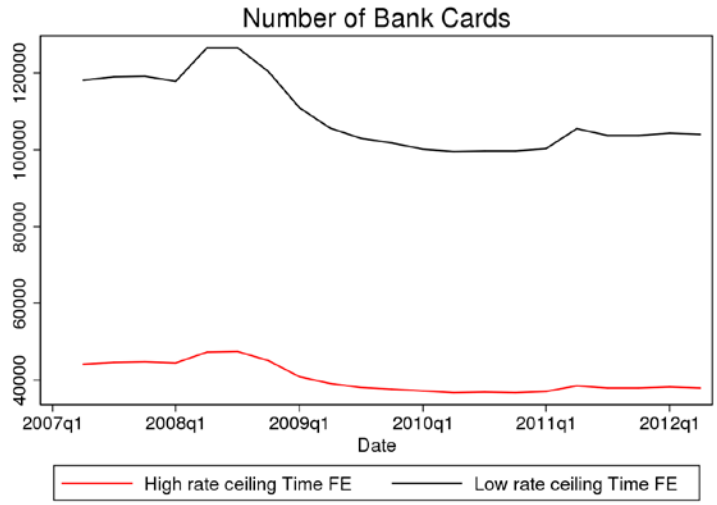
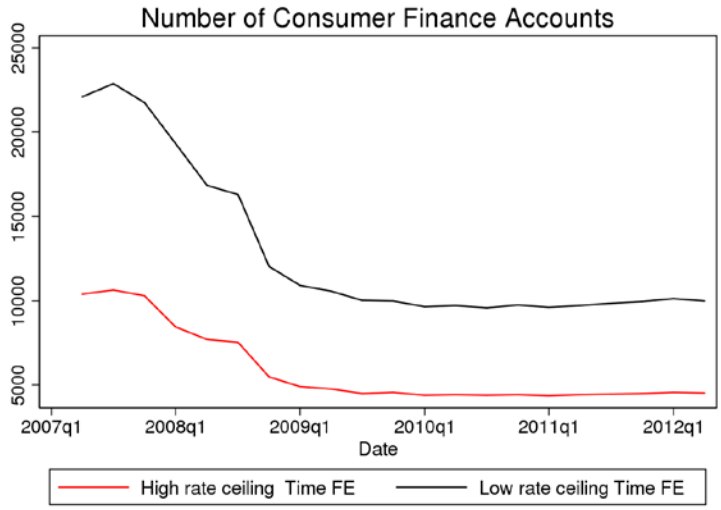
Appendix
Trends in account holding: By credit score category and height of state consumer finance rate ceiling

Prime consumers





Nonprime consumers