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Abstract

Young borrowers are the least experienced financially and, conventionally, thought to be most prone to financial mistakes. We study the relationship between age and financial problems related to credit cards. Our results challenge the notion that young borrowers are bad borrowers. We show that young borrowers are among the least likely to experience a serious credit card default. We then exploit the 2009 CARD Act to identify which individuals self-select into obtaining a credit card early in life. We find that individuals who choose early credit card use default less and are more likely to get a mortgage while young.

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1 Introduction

Access to credit serves as an important means for consumption smoothing throughout the life cycle. Young individuals are particularly likely to be liquidity constrained because the beginning of the life cycle is a period of intensive investment in human capital and little wealth to self-insure against transitory income shocks. Credit cards serve as a valuable source of credit to such individuals, given the individuals' limited exposure to other means of credit. The literature on financial literacy, on the other hand, has raised concerns about whether the benefits of early access to credit outweigh the costs. Temptation preferences (Gul and Pesendorfer [2004]), lack of adequate financial literacy (Lusardi, Mitchell, and Curto [2010]), and cognitive biases in financial decision-making (Stango and Zinman [2009, 2011]) provide reasons to limit early access to credit. In part motivated by these considerations, the Credit Card Accountability and Responsibility and Disclosure Act of 2009 (hereafter, CARD Act) made it illegal to issue a credit card to individuals under the age of 21 unless the individual has a cosigner or submits financial information "indicating an independent means of repaying any obligation arising from the proposed extension of credit."

Little to no empirical research exists, however, on credit card default of young individuals. The analysis of whether young borrowers are bad borrowers is complicated by self-selection of individuals into early credit card market entry. That is, early entrants may be better or worse credit risks than average debtors. In addition to the selection effect, early entry has at least two other effects on default behavior. An individual who obtains a credit card early has more time to accumulate debt and thus is more likely to experience a delinquency. On the other hand, an early entrant has more time to learn about servicing debt and thus become a lower risk debtor compared to individuals of similar age who enter later. The selection effect might mitigate either of these effects.

In this paper, we use the New York Federal Reserve Bank Consumer Credit Panel/Equifax (CCP) to analyze whether young borrowers are worse credit risks and to estimate the selection effect of early entry into the credit card market. To identify the selection effect, we use the CARD Act as a quasi-natural experiment. To our knowledge, ours is the first paper to estimate the relationship between age and default as well as to address this selection effect.

We first study whether young credit card holders are more likely than older credit card holders to experience credit card delinquency. Using data from the period prior to the Act, we find that individuals under the age of 21 are substantially less likely to experience serious delinquency (90 days past due and longer). In general, the incidence of serious delinquency has an inverse U-shaped relation with age. In particular, an individual aged 40 to 44 is 12 percentage points more likely to experience a serious delinquency than an individual aged 19. These differences are economically large considering that the share of serious delinquency in the population is less than 7 percent. There is some evidence that young credit card holders are more likely to experience minor delinquencies (30 or 60 days past due) than older card holders; however, the magnitudes of the differences in minor delinquency across ages are much smaller than those we find for serious delinquency.

We next estimate the type of individuals who are most likely to self-select into early credit card use. To identify the selection effect, we exploit Title 3 of the CARD Act, which restricts credit cards for individuals under the age of 21. In particular, we compare the default behavior of two groups of individuals of the same age who also enter the credit card market at the same age. The first group consists of individuals who get their first credit card at age 21 after the CARD Act. Some of these individuals enter at age 21 by choice while others would have chosen to enter the credit card market earlier in the absence of the Act. The second group consists of individuals who get their first credit card at age 21 but before the CARD Act passes. These individuals do not enter before age 21 by choice. We then use a difference-in-difference approach to identify self-selection into early credit card use.

We show that the CARD Act indeed altered the credit available to individuals under the age of 21 making Title 3 a suitable instrument to identify selection into early credit card use. In particular, we find the following changes to credit card availability following the passage of the Act. First, individuals under the age of 21 are 8 percentage points (18 percent) less likely to have a credit card following the passage of the Act. Second, conditional on having a credit card, an individual under 21 has fewer credit cards. Third, conditional on having a credit card, an individual under 21 is 3 percentage points (44 percent) more likely to have a cosigned card. We view these estimates as a lower bound of the effect of the Act because the passage of the CARD Act also likely reduced the representation of youth in the credit

bureau data used in the analysis.

Using the passage of the Act to identify the selection effect, we find that individuals who would have chosen to enter the credit card market early in the absence of the Act are less likely to experience serious delinquency or default than the individuals who enter the credit card market later. Furthermore, these individuals are more likely to be homeowners early in life. We interpret these results as indicating that some young individuals choose to enter the credit card market to establish a credit record and thus facilitate the transition to homeownership. Our findings contrast with the view that young individuals get credit cards early primarily as a response to aggressive advertising to this demographic group.[1]

Finally, we examine whether early use of credit cards raises the risk of default in the future. We find that, conditional on the length of the credit history, individuals who enter the credit card market early have a lower probability of experiencing serious delinquency later in life. In summary, we find no compelling evidence that young borrowers are bad borrowers.

This paper contributes to the literature that studies the effect of access to unsecured credit throughout the life cycle. Sullivan [2008] finds that households use unsecured debt, such as credit cards, to buffer employment shocks. Karlan and Zinman [2010] find that access to high cost credit provides clear net benefits to borrowers across a range of outcomes. Similarly, Morse [2011] finds that access to payday lenders, who charge even higher interest rates than credit card lenders, mitigates the impact of economic shocks on households. Our results do not speak to the desirability of high cost credit across the entire population or the consequences of other provisions of the CARD Act. We leave these questions for future research.[2]

[1] Concerns about marketing credit cards to individuals under 21 have featured prominently in the sociology literature (for example, Manning [2001], Roberts and Jones [2001], Compton and Pfau [2004], and Borden, Lee, Serido, and Collins [2008]).

[2] Since Ausubel's [1991] seminal study of the credit card industry, researchers have uncovered numerous facts about credit card borrowing that are difficult to reconcile with a traditional life cycle view of informed consumer borrowing. Meier and Sprenger [2010] document a correlation between present-biased preferences and credit card borrowing. Laibson, Repetto, and Tobacman [2007] add credit card borrowing to an otherwise standard life cycle model and find substantial evidence of present-biased preferences. Gross and Souleles [2002] note that a large fraction of households that pay interest on their credit cards simultaneously hold significant liquid assets. Melzer [2011] and Bhutta [2012a] do not find evidence that payday lending improves financial outcomes for borrowers.

Jiang and Dunn [2013] study credit card debt accumulation by young borrowers. Using survey data, they find that young borrowers accumulate credit card debt at higher rates than other age groups. Our results suggest that, despite this more rapid debt accumulation, young borrowers are not bad borrowers. Rather, Jiang and Dunn's findings are consistent with a life cycle view of credit in which young individuals borrow against higher anticipated future income. Because many individuals under 21 are students, they may have especially steeply sloped income profiles leading them to acquire debt at higher rates than the rest of the population.

The reminder of the paper is structured as follows. Section 2 describes Title 3 of the CARD Act and the data. In section 3, we document the relationship between the incidence of credit card default and age using data from the period prior to the CARD Act. In section 4, we show that Title 3 of the CARD Act significantly reduced the availability of credit cards to its intended population. We then exploit the discrete cutoff age to identify differences between borrowers that enter the credit card market early and those that choose to enter later. In section 5, we examine whether early entry into credit card markets increases the risk of serious delinquency later in life. Section 6 concludes.

2 Background on the CARD Act and Data

2.1 The CARD Act

The CARD Act restricts many aspects of the credit card business, such as when lenders can change the interest rate on a credit card, the fees lenders may charge on credit cards, and credit card disclosures. The timeline of the Act is as follows: on April 30, 2009, the bill passed the House of Representatives; on May 19, 2009, the Act passed the Senate; President Obama signed the Act into law on May 22, 2009. Full compliance with Title 3 of the CARD Act was required by February 22, 2010.[3]

[3] The House of Representatives approved a version of the law, known as the Credit Cardholder's Bill of Rights Act of 2008 on September 23, 2008. That version of the law was never acted on by the Senate and, as such, never became law. The Credit Cardholder's Bill of Rights Act passed by the House of Representatives in 2008 merely prohibited extending credit cards to individuals under the age of 18 (see HR 5244).

2.2 Data

The data in the analysis are from the New York Federal Reserve Bank Consumer Credit Panel/Equifax. The CCP is an individual-level panel dataset that contains detailed records of individual debt and borrowing on a quarterly basis from the first quarter of 1999 to the most recent quarter. The CCP is a 5 percent random sample of all U.S. consumers with a credit record and a social security number. These individuals constitute the primary sample. In addition, the CCP sample contains information about individuals who reside at the same address as individuals in the primary sample. Some of these individuals may have very limited experience in credit markets and thus have so-called "thin" credit records. The individuals in the primary sample along with the individuals who reside at the same address as individuals in the primary sample constitute the full sample.

In the analysis, we focus on the full sample because many of the young individuals whom we are interested in studying have thin credit records and are thus likely to be present in the full sample but not in the primary sample. Our main results hold in the primary sample as well.[4] Lee and van der Klaauw [2010] provide an excellent description of the CCP data and we refer the reader to their paper for additional details on the CCP.

Given the age cutoffs imposed by the CARD Act, knowing the exact age of an individual is important for our empirical strategy. For each individual, the CCP provides the individual's year of birth rather than their exact date of birth. We therefore focus on the data from the fourth quarter of each year such that we know the age of the individual with a high probability.

Table 1 presents the number of individuals in our sample by age (18 – 25) and year (2005 – 2012).[5] Individuals aged 18 never comprise more than 6 percent of the total number of 18-25-year-olds in the sample. Because we have relatively few 18-year-olds, we verify the robustness of all our main results to excluding 18-year-olds. As can be seen from the table, after the CARD Act passes in 2009, 18-20-year-olds comprise a smaller portion of the total sample of young individuals. The shares of 18-20-year-olds in the 18-25 age category in the fourth quarter of 2008, 2010, and 2012 are 27.5, 24.5, and 23.2, percent respectively.

[4] The results using only individuals in the primary sample are in an appendix available from the authors.

[5] We exclude individuals residing in U.S. territories and protectorates (e.g., Palau).

One of the exercises in the paper involves a difference-in-difference approach to quantify the effect of the CARD Act on the probability that a young individual has a credit card. Since the data in the analysis represent a sample of the individuals with some credit history, our estimates represent a lower bound of the effect of the Act on the young individuals' use of credit cards.

3 Default Patterns by Age

In this section, we document the empirical relationship between borrower age and credit card default. We study the period from 2005Q4 to 2008Q4 so that the analysis captures both an expansionary and a recessionary period before the CARD Act passed in 2009. In the analysis, we focus on 18-to-23-year-old individuals. We do this because at the time of the analysis the latest data available are from the fourth quarter of 2012, when the oldest individuals affected by the provisions of the Act are 23 years old.

We estimate default behavior by age for all individuals with at least one credit card. We exclude individuals who have a cosigned card from the sample. This restriction allows us to isolate individual card holders' behavior from the influence of parental or guardian supervision. All individuals who have a cosigned card at any date within 1999 – 2008 are excluded from the estimation.[6,7]

We estimate

$$DEF_{i,t} = \Phi(\alpha_0 + \sum_{k=1}^{5} \beta_k^{AGE} \mathbf{1}_{\{age_{i,t}=18+k\}} + \sum_{k=1}^{3} \beta_k^{YEAR} \mathbf{1}_{\{Year_{i,t}=2005+k\}} + \boldsymbol{\gamma}' \mathbf{X}_{i,t}), \qquad (1)$$

where $DEF_{i,t}$ is the binary variable that denotes default, $\mathbf{X}_{i,t}$ is the vector of dummies for the

[6] This procedure also excludes individuals who have individual cards in addition to cosigned cards. For robustness, we also estimate default patterns by age using a less restricted sample. In this alternative sample, we exclude all individuals for whom total credit limit on cosigned cards is not smaller than the total credit limit on all cards at any date during 1999 - 2008. Thus, we exclude those individuals who have only cosigned cards but include those individuals who have both individual and cosigned cards. The results from this alternative sample are similar to the results from the benchmark sample and are available upon request.

[7] We consider an individual as having a credit card if he has a positive value for the variable that indicates the number of credit cards, or a positive value for the variable that indicates the highest amount of credit available on credit cards. If an individual has a positive value for the credit available through joint credit card accounts, we consider that person as having a cosigned card.

individual's state of residence in period t, and $\Phi(\cdot)$ is the cumulative standard normal distribution function. We consider three different types of default ($DEF_{i,t}$): $30DPD_{i,t}$, $60DPD_{i,t}$, and $SERIOUS_{i,t}$. $30DPD_{i,t}$ and $60DPD_{i,t}$ take the value 1 if individual i has a flag for a 30-day delinquency or a 60-day delinquency on a credit card in period t, respectively. $SERIOUS_{i,t}$ takes the value 1 if the individual has a flag for a 90-day or greater delinquency, a 120-day or greater delinquency, a severe derogatory event, a credit card account in collections, or a bankruptcy in period t.

Table 2 presents the results for 18-to-23-year-old individuals. Because there are relatively few 18 year old individuals in the sample, we also estimate the relationship between age and default excluding 18-year-olds. These results are contained in the appendix, Table A.1.

The results in Table 2 indicate that the risk of serious default increases with age (column 3). To facilitate interpretation of the magnitudes, columns 4 – 6 present the results from the estimation using OLS. The OLS results indicate that a 23-year-old individual is 16 percentage points more likely than an 18-year-old individual and 7 percentage points more likely than a 19-year-old individual to experience a serious default (column 6).

The relationship between minor delinquency and age appears to be hump-shaped. The results in Table 2 show that 18-year-old individuals are less likely than older individuals to experience a minor delinquency event on a credit card (columns 1, 2, 4, and 5). Starting from age 19, the probability of experiencing a minor delinquency event on a credit card decreases with age (see also Table A.1). However, the economic magnitude of the difference in minor delinquencies never exceeds 1 percentage point.

To obtain a complete picture of the correlation between age and credit card default, we estimate a specification similar to the one in equation (1) for individuals of all ages:

$$\begin{aligned} DEF_{i,t} \;=\; & \Phi(\alpha_0 + \sum_{k=1}^{11} \beta_k^{AGE} \mathbf{1}_{\{age_{i,t}=18+k\}} + \beta^{30-34} \mathbf{1}_{\{age_{i,t}>29 \& age_{i,t}<35\}} \\ & + \beta^{35-39} \mathbf{1}_{\{age_{i,t}>34 \& age_{i,t}<40\}} + \beta^{40-44} \mathbf{1}_{\{age_{i,t}>39 \& age_{i,t}<45\}} \\ & + \beta^{45-54} \mathbf{1}_{\{age_{i,t}>44 \& age_{i,t}<55\}} + \beta^{55-64} \mathbf{1}_{\{age_{i,t}>54 \& age_{i,t}<65\}} \\ & + \beta^{65+} \mathbf{1}_{\{age_{i,t}>64\}} + \sum_{k=1}^{3} \beta_k^{YEAR} \mathbf{1}_{\{Year_{i,t}=2005+k\}} + \boldsymbol{\gamma}' \mathbf{X}_{i,t}). \end{aligned} \tag{2}$$

The sample for estimating (2) consists of a random 10 percent sample of the individuals in the CCP data.

Table 3 presents the results from estimating equation (2) across the full age distribution. The coefficients are also shown in Figure 1. The table shows that serious default peaks at middle age and is lowest among the young and elderly. The differences in the propensity to experience a serious default across age groups are economically large. For example, an individual aged $40 - 44$ is 12 percentage points more likely to experience a serious default than a 19-year-old and 13 percentage points more likely than an individual 65 or older. The results show that 18-year-olds are particularly unlikely to experience a serious delinquency. We note, however, that there are few of them in our sample.

The relation between minor delinquency and age is less robust than the one between serious default and age. The economic differences in the delinquency propensities from one age category to the next are much smaller than the differences in the serious default propensities and generally do not exceed one percentage point. The greatest magnitude of the difference across ages in the likelihood of minor delinquency is for those ages 65 or above, who have a 1.17 percentage point lower chance of a 30-day delinquency than individuals aged 18. Table A.2 in the appendix shows the results from estimating equation (2) on the sample without 18-year-old individuals. Qualitatively, the results from Table 3 carry through.

Our finding that young individuals are more likely to experience minor delinquencies than older individuals is consistent with the view that young individuals are prone to financial mistakes due to, for example, poor financial literacy (Agarwal, Driscoll, Gabaix, and Laibson [2009] and Lusardi, Mitchell, and Curto [2010]). As young individuals learn from their experience of servicing credit card debt, minor delinquencies fall. Learning might include such simple techniques as automating bank payments of credit card bills, consolidating credit cards, better organization of financial documents, or learning to set aside time for paying bills. However, financial literacy does not seem to be the main driver of serious delinquency because, as the results show, the probability of serious delinquency increases with age up to the middle age.

4 The Selection into Early Credit Card Use

We next turn to the question of what types of individuals choose to get a credit card early. There is a concern that the individuals who obtain credit cards early in life are particularly prone to financial problems related to credit card use, and this concern serves as a motivation for restricting early entry into the credit card market.

We use data from the passage of the CARD Act to estimate the risk profile of individuals who self-select into entering the credit card market early. Our identification strategy relies on the CARD Act delaying entry into the credit card market for some young individuals. We thus first assess whether the Act restricted access to credit cards for individuals under the age of 21.

4.1 The Effect of the Act on Credit Card Availability

We use Title 3 of the Act as a quasi-natural experiment. The treated group in the experiment consists of individuals who are aged 18 – 20 at the time the Act is enacted, i.e., in 2010Q1. Since we do not have the exact age of an individual, we consider everyone who is 18 – 20 in 2010Q4 as a treated group. These are individuals born in 1990 – 1992. The control group consists of the individuals who were very close in age to the treated group but old enough not to be affected by the provision of the Act.

To learn whether the Act in fact altered credit availability, we focus on the set of individuals for whom our data contain (1) a credit record in 2008Q4 (the last quarter before potential anticipation of the Act), and (2) a credit record at the time the individual was 18 years of age. The credit record refers to any credit record (student loan, auto loan, cosigned card, etc.), not necessarily a record associated with having an individual credit card.

The CCP contains data on individuals who have a credit record. The credit record is not necessarily associated with a credit card. The CARD Act likely altered the entry rate of young individuals into the credit market and thus the number of young individuals captured by the CCP data. The first restriction ensures that in the analysis we focus on the individuals who were already in the credit market (i.e., had a credit record which was not necessarily associated with a credit card) prior to the period when the Act was enacted

(2008Q4). Removing this restriction would introduce a selection bias into our estimation results as the treated and control groups would likely be dissimilar individuals.

The second restriction ensures that the individuals in the control group and the ones in the treated group first enter credit markets when they are at most 18 years old. We impose this restriction because individuals who first enter the formal credit market later in life may systematically differ from individuals who enter the credit market at age 18, who are the focus of our analysis in the next section.

4.1.1 Anticipatory Effects

In this section, we examine whether there is evidence of anticipatory effects of the Act prior to 2010Q1, i.e., whether the individuals who were 21 by the end of 2009Q4 were unaffected by the Act. This will allow us to establish the latest date at which we can assume that individuals were unaffected by the provision of the Act.

Although full compliance with the provisions of the Act was required by February 2010, borrowers and lenders might have altered their behavior in anticipation of the Act coming into full effect. On the borrowers' side, it is possible that the individuals who would be affected by the Act changed their behavior between the time the Act was first anticipated and when the Act came into effect by, for example, obtaining an additional credit card that they would not have obtained otherwise. It is also possible that credit card issuers changed their behavior in anticipation of the law. Credit card issuers may have tried to increase their supply of credit to young individuals immediately prior to the Act to mitigate the effect of the Act on their profits. Alternatively, credit card lenders may have altered their systems and procedures in the months prior to the Act coming into effect to ensure that they were in compliance with the Act's provisions when it came into effect. A priori, it is not obvious which effect dominates.

We assume that the first anticipated date of the law was 2009Q1, i.e., we take 2008Q4 as the last quarter prior to the period when the Act can be anticipated either by credit card borrowers or lenders. This is because the restriction on individuals below the age of 21 was not in the version of the bill that passed the House in September of 2008.[8] We then study

[8] A Google news search for 2008Q4 reveals no news of the ban on credit cards to individuals below the

changes in the indicators of the availability of credit via credit cards from 2008Q4 (the period before Title 3 can be anticipated) to 2009Q4 (the last period before Title 3 takes effect). Our focus on only these two end quarters allows us to avoid the inference problems that arise from serially correlated disturbance terms (see Bertrand, Duflo, and Mullainathan [2004]).

To identify the anticipatory effects of the Act, we compare the behavior of the individuals who would be affected by Title 3 of the Act (i.e., individuals aged 19 or 20 years old at the time the law came into full effect (2010Q1)) with the behavior of individuals of a very similar age but who would not be affected by Title 3 (i.e., individuals aged 21 or 22 when the law came into effect). Thus, in the former group, we consider the individuals who turn 20 or 21 at some point in 2010, i.e., those born in 1990 or 1989. In the latter group, we consider the individuals who turn 22 or 23 at some point in 2010, i.e., those born in 1988 or 1987. The inclusion of the latter group enables us to control for the change in macroeconomic factors and changes in other aspects of the consumer credit business affected by the Act that occurred between 2008Q4 and 2009Q4.

We study the effects of the Act on the following indicators of credit available via credit cards: (1) the probability of having a credit card, (2) the number of credit cards, and (3) the probability of having a cosigned card. Using data from 2008Q4 and 2009Q4, we estimate the following specification for individuals born between 1987 and 1990

$$\begin{aligned} I^i_{i,t} &= \Phi(\alpha_0^{ANTIC} + \alpha_{20}^{ANTIC}\mathbf{1}_{\{2009Q4\}}\mathbf{1}_{\{age_{i.t}=19\}} \\ &\quad +\alpha_{21}^{ANTIC}\mathbf{1}_{\{2009Q4\}}\mathbf{1}_{\{age_{i.t}=20\}} + \delta^{ANTIC}\mathbf{1}_{\{2009Q4\}} \\ &\quad + \sum_{k=1}^{4}\beta_k^{ANTIC}\mathbf{1}_{\{age_{i,t}=18+k\}} + \boldsymbol{\gamma}'^{ANTIC}\mathbf{X}_{i,t}), \end{aligned} \tag{3}$$

where $I^i_{i,t}$ is one of the three indicators of the credit available via credit cards. In particular, $I^i_{i,t}$ stands for the following variables: (1) $HASCARD_{i,t}$, where $HASCARD_{i,t}$ equals 1 if the individual has at least one credit card in quarter t (including cosigned cards) and 0 otherwise; (2) $NCARDS_{i,t}|_{HASCARD_{i,t}=1}$, where $NCARDS_{i,t}|_{HASCARD_{i,t}=1}$ is the number of credit cards that the individual has in quarter t (including cosigned cards), conditional

age of 21, providing additional evidence for a lack of anticipation of Title 3 in 2008Q4.

on having at least one credit card in quarter t; and (3) $COSIGNCARD_{i,t}|_{HASCARD_{i,t}=1}$, where $COSIGNCARD_{i,t}|_{HASCARD_{i,t}=1}$ equals 1 if, conditional on having a credit card, at least one credit card is a joint account. If the equation is estimated for $HASCARD_{i,t}$ or $COSIGNCARD_{i,t}|_{HASCARD_{i,t}=1}$, then $\Phi(\cdot)$ is the cumulative standard normal distribution function. If the equation is estimated for $NCARDS_{i,t}|_{HASCARD_{i,t}=1}$, then $\Phi(Z) = Z + \varepsilon_{i,t}$ where $\varepsilon_{i,t}$ is the error term.

In equation (3), $1_{\{2009Q4\}}$ is an indicator that equals 1 if t is 2009Q4 and 0 otherwise, $1_{\{age_{i.t}=j\}}$ is an indicator that equals 1 if the individual is aged j at the end of year t, and $X_{i,t}$ is the vector of dummies for the individual's state of residence in period t. When estimating equation (3) with the dependent variable $NCARDS_{i,t}|_{HASCARD_{i,t}=1}$ or $COSIGNCARD_{i,t}|_{HASCARD_{i,t}=1}$, we restrict the sample to individuals who have at least one credit card.

The sample for estimating (3) with the dependent variable $HASCARD_{i,t}$ consists of two observations for individuals born in 1990 (one observation for 2008 and one observation for 2009), two observations for individuals born in 1989, two observations for individuals born in 1988, and two observations for individuals born in 1987. The sample for estimating (3) with the dependent variable $NCARDS_{i,t}|_{HASCARD_{i,t}=1}$ or $COSIGNCARD_{i,t}|_{HASCARD_{i,t}=1}$ consists of up to two observations for each individual and exactly two for each individual who has at least one credit card in each period. Consequently, the individuals in the sample are of five different ages: 18 years old in 2008, 19 years old in 2008 and 2009, 20 years old in 2008 and 2009, 21 years old in 2008 and 2009, and 22 years old in 2009. Thus, observing the individuals from the four birth years in two time periods allows us to identify seven coefficients in equation (3): the 2009-year effects, four age effects, and two age-year interaction effects.

The coefficients α_{20}^{ANTIC} and α_{21}^{ANTIC} capture any differential impacts the Act had on individuals that turned 20 and 21 by the end of 2010, respectively. As such, we anticipate the magnitude of α_{21}^{ANTIC} to be smaller than the magnitude of α_{20}^{ANTIC} because an average individual who is 21 in 2010Q4 would experience only limited effects of the Act.

Table 4 contains the estimation results. The first two columns present the results from the probit estimation of whether an individual in the sample has a credit card and whether,

conditional on having a card, the individual has a cosigned card. The last three columns present the OLS estimates of whether the individual has a card, the number of cards an individual has conditional on having a card, and whether, conditional on having a card, the individual has a cosigned card.

When HASCARD and NCARDS are the dependent variables, the estimated coefficients $\hat{\alpha}_{20}^{ANTIC}$ and $\hat{\alpha}_{21}^{ANTIC}$ are negative and strongly statistically significant, indicating that the individuals targeted by the Act are less likely to have a credit card after the Act passed and, conditional on having at least one card, have fewer cards. When COSIGNCARD is the dependent variable, $\hat{\alpha}_{20}^{ANTIC}$ and $\hat{\alpha}_{21}^{ANTIC}$ are positive and statistically significant at the 1 percent level, indicating that individuals who have at least one card are more likely to have a cosigned card as a result of the Act. In particular, individuals aged 19 in 2009 are 6 percentage points less likely to have a credit card and, conditional on having a card, 3 percentage points more likely to have a cosigned card. The effects are somewhat less pronounced for 20-year-olds in 2009: 20-year-olds are 2 percentage points less likely to have a card and, conditional on having at least one card, 2 percentage points more likely to have a cosigned card.

The results indicate that there is evidence of anticipatory effects of the CARD Act. We thus treat 2009 as part of the period affected by the provision of Title 3 of the Act.

4.1.2 Cumulative Change in Credit Availability from the Act

To identify the effect of Title 3, we would like to compare credit available via credit cards before the Act and immediately after the Act took effect. As the above results suggest, the period immediately before full compliance with the Act was required but after the bill had passed shows evidence of anticipatory effects of the Act. Thus, to identify the total effect of the Act on credit, we compare the difference in credit card indicators between 2008Q4 and 2010Q4. Full compliance with the Act was required in 2010Q1. Using 2010Q4 allows us to identify the age of an individual from his birth year with a high degree of certainty.

Using the data from the two periods, 2008Q4 and 2010Q4, we estimate the following

equation for individuals born between 1986 and 1990

$$
\begin{aligned}
I_{i,t}^{i} &= \Phi(\alpha_0^{SHORT} + \alpha_{20}^{SHORT}\mathbf{1}_{\{2010Q4\}}\mathbf{1}_{\{age_{i.t}=20\}} \\
&\quad + \alpha_{21}^{SHORT}\mathbf{1}_{\{2010Q4\}}\mathbf{1}_{\{age_{i.t}=21\}} + \delta^{SHORT}\mathbf{1}_{\{2010Q4\}} \\
&\quad + \sum_{k=1}^{6}\beta_k^{SHORT}\mathbf{1}_{\{age_{i,t}=18+k\}} + \boldsymbol{\gamma}'^{SHORT}\mathbf{X}_{i,t}), \qquad (4)
\end{aligned}
$$

where the dependent variable $I_{i,t}^{i}$ is one of the three indicators described after equation (3), and $\Phi(\cdot)$ is the function described after equation (3).

The sample for estimating equation (4) with $HASCARD_{i,t}$ as the dependent variable consists of two observations for individuals born in 1990 (one observation for 2008 and one observation for 2010), two observations for individuals born in 1989, two observations for individuals born in 1988, two observations for individuals born in 1987, and two observations for individuals born in 1986. Consequently, the individuals in the sample are of seven different ages: 18 years old in 2008, 19 years old in 2008, 20 years old in 2008 and 2010, 21 years old in 2008 and 2010, 22 years old in 2008 and 2010, 23 years old in 2010, and 24 years old in 2010. Relative to the sample that we use to identify the anticipatory effects, we add the individuals born in 1986 because we cannot identify both the treatment effect and the age fixed effects with only individuals born in 1987 – 1990 when individuals have aged another year relative to the time before the Act became effective. The sample for estimating equation (4) with dependent variable $NCARDS_{i,t}|_{HASCARD_{i,t}=1}$ or $COSIGNCARD_{i,t}|_{HASCARD_{i,t}=1}$ consists of up to two observations for each individual and two for each individual that has at least one credit card in each period from the 1986 – 1990 cohorts.

Table 5 presents the results from estimating (4). Individuals aged 20 in 2010Q4, who received the largest dose of treatment from Title 3, are 8 percentage points less likely to have a credit card and, if they have a credit card at all, 3 percentage points more likely to have a cosigned card. Conditional on having at least one credit card, they are likely to have a smaller number of cards, although the magnitude of this last effect is small: The reduction in the number of credit cards for individuals aged 20 in 2010Q4 is 0.04 cards. All of these effects are statistically significant at the 1 percent level. Our findings regarding the Act having reduced the supply of credit indicate that at least some of the deleveraging of

the American consumer in the recovery from the financial crisis (see Bhutta [2012b]) was involuntary.

4.2 Who are Early Credit Card Users?

4.2.1 Credit Card Default and Entry Age

Having established that Title 3 of the CARD Act had a material effect on the availability of credit cards to individuals under the age of 21, we now use the effect of the Act to identify differences between individuals who choose to get a credit card before age 21 and those who wait until later in life to enter the credit card market.

Our identification strategy is as follows. We use data from 2009Q4 and 2012Q4 on individuals aged 22 who got their first credit card at age 21 and all individuals aged 25.[9] After dropping all individuals with cosigned cards in any period prior to the observation date, we estimate

$$\begin{aligned} I_{i,t} &= \Phi(\alpha_0 + \beta^{selection}\mathbf{1}_{\{age_{i,t}=22\}}\mathbf{1}_{\{YEAR_{i,t}=2009\}} \\ &\quad +\beta^{25}\mathbf{1}_{\{age_{i,t}=25\}} + \beta^{2012}\mathbf{1}_{\{YEAR_{i,t}=2012\}} + \boldsymbol{\gamma}'\mathbf{X}_{i,t}), \end{aligned} \tag{5}$$

where $I_{i,t} \equiv SERIOUS_{i,t}$ such that the variable equals 1 if the individual has a serious delinquency incident associated with a credit card, and 0 otherwise.[10]

The 22-year-old individuals in 2009 who first got a credit card at age 21 chose not to get a credit card earlier. In contrast, because of the CARD Act, at least some of the 22-year-old individuals in 2012 who first got a credit card at age 21 would have chosen to get a credit card earlier, at age 19 or 20, but were unable to do so. Both sets of individuals aged 22 have the same length of credit history, and thus the same timespan to learn firsthand about servicing their credit cards and to accumulate credit card debt. We take the first date the individual has a credit card as the entry age into the credit card market regardless of whether the individual subsequently has no credit card during some periods. To ensure that we are able to identify the age of entry into the credit card market, in the estimation of (5) we drop

[9] As a robustness check, we repeat the exercise for 2008Q4 and 2012Q4.

[10] In addition to data from 2009 to 2012, we use data from 1999 to 2008 to identify the entry age.

individuals who enter the CCP panel already having a credit card.

The 25-year-olds are untreated in both periods. An individual aged 25 in 2009Q4 or in 2012Q4 was at least 21 in 2008Q4 just before the Act was passed. We include the 25-year-olds to capture changes over time in default behavior. In particular, it is likely that there are differences in default behavior over time due to the changes in macroeconomic conditions and the changes in other provisions of the CARD Act that affect individuals of all ages.

The interpretation of $\beta^{selection}$ is thus one of selection. If $\beta^{selection} < 0$, individuals who choose to first enter the credit card market at age 21 are better credit risks than those who choose to enter the credit card market earlier. If $\beta^{selection}$ is statistically indistinguishable from 0, there is no difference in the propensities to default of individuals who enter the credit card market at the age of 21 and individuals who enter the credit card market earlier than 21. If $\beta^{selection} > 0$, individuals who choose to enter the credit card market at 21 are worse credit risks than those who enter earlier.

The results in Table 6 indicate that the individuals who enter the credit card market earlier in life are better credit risks, i.e., less likely to experience a serious delinquency associated with a credit card, than individuals who choose to enter later in life. The selection effect for serious delinquency is statistically significant at the 1 percent level both in our benchmark specification and when we use 2008 as the base year rather than 2009 (results not shown).

Table 6 also shows the results for estimating the selection effect for 30- and 60-day delinquency on credit cards. As can be seen from the table, individuals who choose to enter the credit card market early are slightly more likely to experience minor delinquencies. The magnitude of the selection effect on minor delinquencies is much smaller than that on serious delinquencies. Furthermore, the selection coefficient on minor delinquencies is not statistically significant when we use 2008 as the base year rather than 2009. Thus, the selection effect for minor delinquencies appears to be less robust than the selection effect for serious default.

4.2.2 Mortgage Credit and Entry Age

One of the concerns about access to credit early in life is that young individuals risk adversely affecting their credit history and, with it, their ability to get credit when they really need it, such as to purchase a home or to finance a small business. In this section, we therefore explore whether early access to credit cards affects the likelihood that the individual has a mortgage at age 22 or age 23. Mortgage credit in the U.S. is a particularly important type of credit because of its strong association with homeownership.[11] Young individuals are especially likely to need a mortgage to access homeownership since they have had little time to accumulate wealth.

We first estimate the reduced form relationship between the probability of having a mortgage and age of entry into credit card markets, i.e.,

$$\begin{aligned} MTG_{i,t} &= \Phi(\alpha_0 + \beta^{22_lateentry}\mathbf{1}_{\{entryage_{i,t}>20\}}\mathbf{1}_{\{age_{i,t}=22\}} \\ &\quad +\beta^{23_lateentry}\mathbf{1}_{\{entryage_{i,t}>20\}}\mathbf{1}_{\{age_{i,t}=23\}} \\ &\quad +\beta^{23}\mathbf{1}_{\{age_{i,t}=23\}} + \sum_{k=1}^{3}\beta_k^{YEAR}\mathbf{1}_{\{Year_{i,t}=2005+k\}} + \boldsymbol{\gamma}'\mathbf{X}_{i,t}), \end{aligned} \tag{6}$$

where $MTG_{i,t}$ takes the value 1 if individual i has a mortgage in period t and 0 otherwise. The mean of the dependent variable is 3.4 percent. The base category for (6) is thus individuals aged 22 who first got a credit card when they were younger than 21. The sample consists of all individuals aged 22 or 23 in 2005 – 2008 for whom we can precisely date the age at which they enter the credit card market. Thus, as in our estimation of the relationship between entry age and default, we exclude individuals who enter the CCP panel already having a credit card since we cannot determine when such individuals first received a credit card.

Table 7 presents the results from estimating (6). The results show that individuals who enter the credit card market early are more likely to have a mortgage by age 22 or 23. Thus, any damage individuals who enter early inflict on their credit history may be dominated by the benefit of a longer credit history.

Another possibility that may explain the results in Table 7 is that individuals who choose

[11] See Bostic and Gabriel (2006) and Caplin, Cororaton, and Tracy (2013) regarding U.S. policies to promote homeownership.

to get credit early are disproportionately people who prefer to get a mortgage early in life. To consider this possibility, we again exploit the exogenous variation in entry age provided by the CARD Act to identify whether individuals who choose to enter the credit card market earlier are more or less likely to get a mortgage because of unobservable individual characteristics rather than causal effects of early access to credit. To do so, we use data from $2009Q4$ and $2012Q4$ on individuals aged 22 who got their first credit card at age 21 and all individuals aged 25. After dropping all individuals with cosigned cards in 1999 – 2012, we estimate

$$\begin{aligned} MTG_{i,t} &= \Phi(\alpha_0 + \beta^{selection}\mathbf{1}_{\{age_{i,t}=22\}}\mathbf{1}_{\{YEAR_{i,t}=2009\}} \\ &\quad +\beta^{25}\mathbf{1}_{\{age_{i,t}=25\}} + \beta^{2012}\mathbf{1}_{\{YEAR_{i,t}=2012\}} + \boldsymbol{\gamma}'\mathbf{X}_{i,t}). \end{aligned} \tag{7}$$

As before, both sets of individuals aged 22 have the same length of credit history, and thus the same timespan to learn firsthand about credit cards and to accumulate credit card debt. As before, we include the 25-year-olds (who are untreated in both periods) to capture changes over time in the propensity to have a mortgage. The interpretation of $\beta^{selection}$ is thus one of selection. If $\beta^{selection} < 0$, individuals who choose to first enter credit card markets at age 21 have unobservable characteristics that make them less likely to get a mortgage than those who choose to enter the credit card market at below age 21.

Table 8 reveals that, indeed, the individuals who choose to get a credit card later in life, rather than those who are forced to delay entry by the CARD Act, are less likely to have a mortgage at an early age. One motivation for entering the credit card market below the age of 21 thus appears to be homeownership.

5 Does Early Entry Increase Default Later in Life?

In this section, we study default behavior by entry age to examine the effect of early entry into the credit card market on default behavior later in life.

We estimate an equation in which we control for the age at which an individual enters the credit card market rather than the individual's current age. This allows us to control for the length of the individual's experience in the credit card market. The length of an individual's

experience in the credit card market is a key determinant of serious default because the longer an individual's credit history is, the more time he or she has had to accumulate debt. In particular, we estimate

$$\begin{aligned} DEF_{i,t} &= \Phi(\alpha_0 + \sum_{k=1}^{6} \beta_k^{entry} \mathbf{1}_{\{entryage_{i,t}=17+k\}} + \beta^{\exp} QuarterExp_{i,t} \\ &\quad + \beta^{\exp sq} (QuarterExp_{i,t})^2 + \sum_{k=1}^{3} \beta_k^{YEAR} \mathbf{1}_{\{Year_{i,t}=2005+k\}} + \boldsymbol{\gamma}' \mathbf{X}_{i,t}), \end{aligned} \tag{8}$$

where $QuarterExp_{i,t}$ is the number of quarters of experience the individual has in the credit card market.

We use data from 2005 – 2008 to estimate (8). We include individuals aged 21 – 25 who entered the credit card market between the ages of 18 and 24.[12] As before, to avoid the confounding influence of parental or guardian supervision, we exclude from the analysis individuals who have (or previously had) a cosigned card. We also exclude individuals who enter the CCP panel already having a credit card, since we cannot accurately date these individuals' entry into the credit card market.

The estimation of the effect of early entry into the credit card market on default thus keeps credit history constant but varies the age of entry into the credit market. Individuals differ according to their current age and when they enter the credit market. A positive coefficient on β_k^{entry} would indicate that earlier entry is associated with greater default risk.

To allow for the possibility that experience in the credit market affects default in a fashion not captured by our quadratic functional form, we also estimate

$$\begin{aligned} DEF_{i,t} &= \Phi(\alpha_0 + \sum_{k=1}^{6} \beta_k^{entry} \mathbf{1}_{\{entryage_{i,t}=17+k\}} \\ &\quad + \beta_k^{\exp} \sum_{k=1}^{6} \mathbf{1}_{\{YearsExp_{i,t}>=k \& YearsExp_{i,t}<k+1\}} \\ &\quad + \sum_{k=1}^{3} \beta_k^{YEAR} \mathbf{1}_{\{Year_{i,t}=2005+k\}} + \boldsymbol{\gamma}' \mathbf{X}_{i,t}). \end{aligned} \tag{9}$$

[12] We exclude the few individuals who entered the credit card market before age 18. This exclusion does not affect the results.

The results from estimating (8) and (9) are shown in Tables 9 and 10, respectively. The results in the tables show that earlier entrants are less likely to experience a serious default later in life. The results provide no evidence in favor of the notion that early entry into the credit card market results in more financial problems later in life.

6 Conclusions

The emerging literature on consumer financial protection (e.g., Campbell, Jackson, Madrian, and Tufano [2011]) and the passage of the CARD Act in 2009 have generated interest in understanding the risks associated with consumer credit. In this paper, we study the credit card default behavior of young individuals in particular. Title 3 of the CARD Act specifically addresses the issuance of credit cards to young people. We show that Title 3 reduces credit card use by individuals under 21. In particular, individuals affected by Title 3 were 8 percentage points (18 percent) less likely to have a credit card following the Act. We are thus able to use the Act as a quasi-natural experiment to study who chooses to get a credit card at a young age.

We find that individuals under the age of 21 are much less likely to experience a serious default than older individuals. Second, individuals who self-select into early credit card use are lower risk borrowers than people who choose to enter the credit card market later. Third, we find no evidence that entry into the credit card market before age 21 increases the risk of financial problems later in individuals' 20s. Finally, early credit card entry is associated with a higher likelihood of getting a mortgage early in life. The relation between mortgages and early credit card use indicates that young people may choose to enter the credit card market to build a strong credit history to later access homeownership. The results caution against interpreting early entry into the credit card market as a consequence of suboptimal or myopic behavior.

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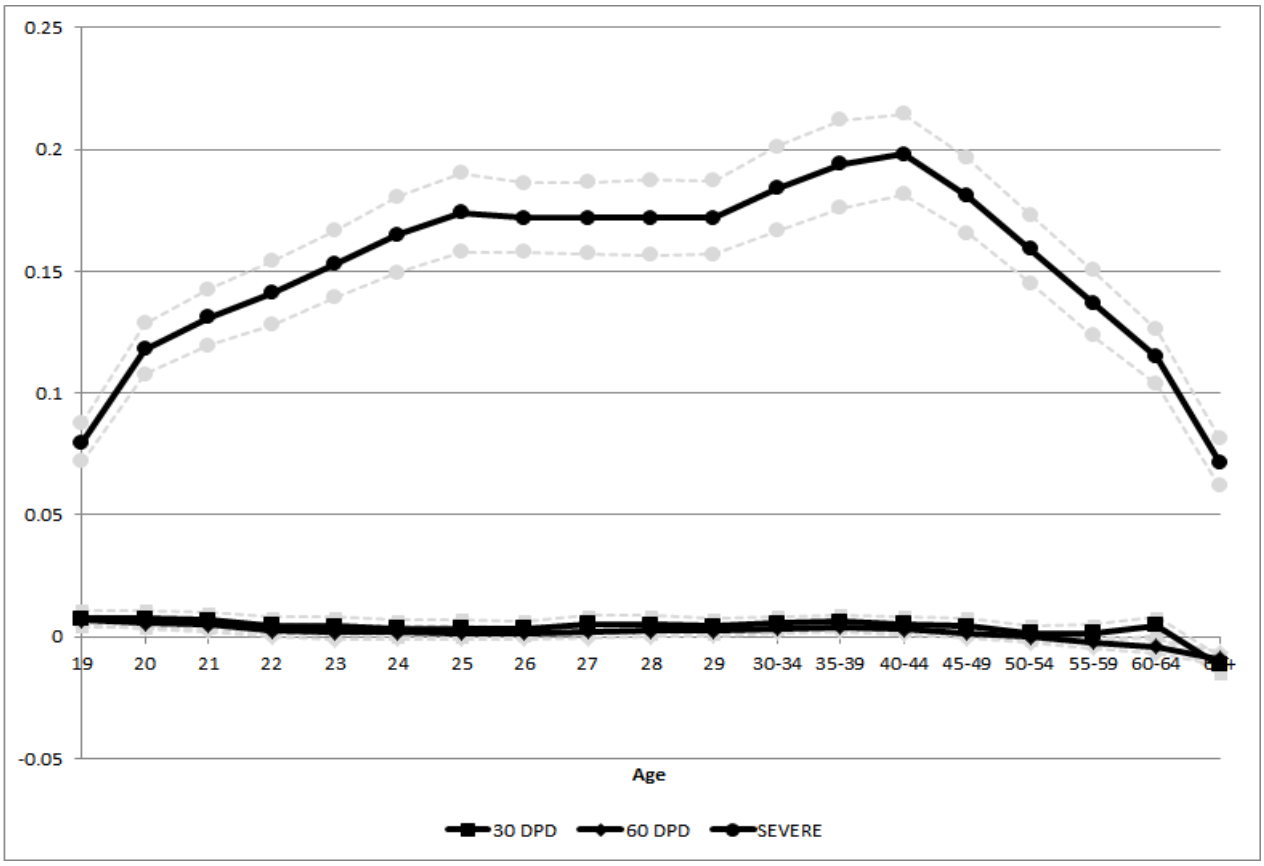
Figure 1: Default by Age, 18+ y.o. Individuals



The figure presents the coefficients from an OLS regression of default on age (equation (2) of the text). The gray dashed lines represent the 95% confidence intervals. The omitted category is age 18.

Table 1: Number of Individuals in the Sample

Notes: 1) Each entry in the table presents the number of individuals in our sample in the fourth quarter of the indicated year. 2) The number in parentheses is the percentage share of the individuals of the specified age in the total sample of 18-to-25-year-olds. 3) All data are from the fourth quarter of the indicated year.

	2005	2006	2007	2008	2009	2010	2011	2012
18	268,516	279,606	268,159	236,545	188,955	188,352	150,967	155,641
	(5.71)	(5.93)	(5.74)	(5.34)	(4.50)	(4.76)	(4.07)	(4.30)
19	472,109	480,891	480,733	438,572	381,815	331,154	305,764	295,855
	(10.03)	(10.21)	(10.29)	(9.90)	(9.09)	(8.37)	(8.24)	(8.18)
20	576,544	577,807	572,856	543,823	494,377	448,205	390,113	388,504
	(12.25)	(12.26)	(12.27)	(12.27)	(11.78)	(11.32)	(10.51)	(10.74)
21	707,396	637,024	623,844	595,520	568,554	531,534	486,544	451,578
	(15.03)	(13.52)	(13.36)	(13.44)	(13.54)	(13.43)	(13.11)	(12.48)
22	643,649	734,983	658,527	623,009	603,894	588,466	553,791	531,520
	(13.68)	(15.60)	(14.10)	(14.06)	(14.38)	(14.87)	(14.92)	(14.69)
23	674,598	654,621	739,527	643,841	620,982	610,986	595,165	574,684
	(14.34)	(13.89)	(15.84)	(14.53)	(14.79)	(15.44)	(16.04)	(15.88)
24	677,488	674,921	655,501	716,419	637,026	622,983	610,769	605,794
	(14.40)	(14.32)	(14.04)	(16.17)	(15.17)	(15.74)	(16.46)	(16.74)
25	684,971	671,955	670,569	632,705	702,490	635,986	618,532	615,372
	(14.56)	(14.26)	(14.36)	(14.28)	(16.73)	(16.07)	(16.66)	(17.00)

Table 2: Default by Age, 18-23-Year-Old Individuals

Notes: 1) The omitted age category is 18-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card, respectively. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
d_age19	0.116***	0.148***	0.663***	0.00769***	0.00708***	0.0784***
	(7.75)	(7.73)	(74.55)	(9.24)	(10.79)	(21.84)
d_age20	0.103***	0.129***	0.855***	0.00667***	0.00603***	0.118***
	(5.12)	(5.33)	(64.92)	(5.66)	(6.47)	(22.59)
d_age21	0.0945***	0.113***	0.919***	0.00608***	0.00517***	0.133***
	(4.32)	(4.14)	(56.76)	(4.63)	(4.73)	(23.37)
d_age22	0.0788***	0.0880**	0.957***	0.00497***	0.00391**	0.142***
	(3.68)	(3.06)	(52.10)	(3.90)	(3.34)	(23.33)
d_age23	0.0654**	0.0713*	1.004***	0.00406**	0.00309*	0.155***
	(2.69)	(2.43)	(53.38)	(2.77)	(2.57)	(22.37)
d_year2006	0.0120***	0.0352***	0.0308***	0.000811***	0.00170***	0.00662***
	(3.69)	(6.95)	(6.26)	(3.68)	(6.88)	(6.67)
d_year2007	0.0670***	0.0971***	0.102***	0.00479***	0.00501***	0.0226***
	(12.86)	(12.76)	(15.30)	(11.50)	(11.23)	(17.14)
d_year2008	-0.00803	0.0249*	0.112***	-0.000531	0.00119*	0.0252***
	(-1.53)	(2.54)	(12.84)	(-1.52)	(2.53)	(12.99)
N	5,777,764	5,777,764	5,777,764	5,777,764	5,777,764	5,777,764

Table 3: Default by Age, 18+ Year Old Individuals

Notes: 1) The omitted age category is 18-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card, respectively. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account. 5) We include a constant as well as year and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
d_age19	0.114***	0.137***	0.654***	0.00743***	0.00680***	0.0798***
	(3.92)	(5.89)	(40.77)	(4.33)	(6.95)	(19.78)
d_age20	0.114***	0.115***	0.837***	0.00739***	0.00549***	0.118***
	(3.67)	(4.61)	(49.71)	(4.08)	(5.38)	(22.16)
d_age21	0.104***	0.102**	0.892***	0.00665***	0.00480**	0.131***
	(3.57)	(3.21)	(43.85)	(3.91)	(3.49)	(22.46)
d_age22	0.0758**	0.0578	0.931***	0.00471**	0.00255	0.141***
	(2.58)	(1.92)	(42.04)	(2.75)	(1.99)	(21.28)
d_age23	0.0721*	0.0430	0.978***	0.00445*	0.00185	0.153***
	(2.23)	(1.16)	(46.61)	(2.34)	(1.15)	(21.90)
d_age24	0.0562	0.0416	1.022***	0.00339	0.00179	0.165***
	(1.83)	(1.30)	(41.99)	(1.89)	(1.30)	(20.71)
d_age25	0.0582	0.0377	1.055***	0.00353	0.00161	0.174***
	(1.80)	(1.18)	(42.17)	(1.86)	(1.17)	(21.12)
d_age26	0.0566*	0.0345	1.047***	0.00343*	0.00148	0.172***
	(2.00)	(1.16)	(44.34)	(2.10)	(1.16)	(23.62)
d_age27	0.0824**	0.0490	1.047***	0.00518**	0.00216	0.172***
	(2.59)	(1.53)	(43.11)	(2.78)	(1.57)	(23.04)
d_age28	0.0787*	0.0568	1.047***	0.00491*	0.00254*	0.172***
	(2.41)	(1.93)	(43.50)	(2.55)	(2.03)	(21.70)
d_age29	0.0705*	0.0569*	1.048***	0.00437**	0.00255*	0.172***
	(2.53)	(2.03)	(44.34)	(2.72)	(2.14)	(22.40)
d_age30_34	0.0873***	0.0756**	1.087***	0.00552***	0.00347***	0.184***
	(3.37)	(3.21)	(45.50)	(3.78)	(3.61)	(20.83)
d_age35_39	0.0966***	0.0847***	1.124***	0.00617***	0.00393***	0.194***
	(3.62)	(3.56)	(45.91)	(4.10)	(4.07)	(20.97)
d_age40_44	0.0844**	0.0665**	1.136***	0.00533**	0.00301**	0.198***
	(3.08)	(2.62)	(46.73)	(3.40)	(2.87)	(23.62)
d_age45_49	0.0694*	0.0376	1.078***	0.00433*	0.00163	0.181***
	(2.38)	(1.33)	(42.72)	(2.55)	(1.35)	(22.97)
d_age50_54	0.0247	-0.00201	1.000***	0.00143	-0.000125	0.159***
	(0.89)	(-0.07)	(37.72)	(0.89)	(-0.11)	(22.24)
d_age55_59	-0.0242	-0.0504	0.912***	-0.00147	-0.00212	0.137***
	(-0.78)	(-1.70)	(32.12)	(-0.81)	(-1.65)	(20.16)
d_age60_64	-0.0808**	-0.106**	0.822***	-0.00449*	-0.00418**	0.115***
	(-2.68)	(-3.11)	(26.87)	(-2.53)	(-2.88)	(20.06)
d_age65andabove	-0.251***	-0.283***	0.611***	-0.0117***	-0.00915***	0.0716***
	(-7.79)	(-7.95)	(16.65)	(-6.26)	(-6.21)	(14.33)
N	4,682,714	4,682,714	4,682,714	4,682,714	4,682,714	4,682,714

Table 4: Anticipatory Effects of CARD Act on Availability of Credit Cards

Notes: 1) The omitted age category is 18-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: HASCARD takes the value 1 if the individual has a credit card. COSIGNCARD takes the value 1 if, conditional on having at least one credit card, the individual has a cosigned card with a positive balance. NCARDS is the number of credit cards the individual has conditional on having at least one credit card. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2008-2009. 7) The number of observations differs slightly for NCARDS than for COSIGNED because, occassionally, we are missing an observation for the number of cards but know that the individual has some balance that is cosigned.

	Probit		OLS		
	HASCARD	COSIGNCARD	HASCARD	NCARDS	COSIGNCARD
	(1)	(2)	(3)	(4)	(5)
d_19	0.511***	-0.133***	0.195***	0.298***	-0.0190***
	(57.60)	(-5.01)	(59.19)	(26.77)	(-3.86)
d_20	0.707***	-0.110***	0.270***	0.534***	-0.0164**
	(34.42)	(-3.35)	(34.04)	(25.72)	(-2.91)
d_21	0.767***	0.0422	0.293***	0.692***	0.00579
	(26.33)	(1.26)	(26.04)	(23.60)	(1.20)
d_22	0.817***	0.122**	0.312***	0.833***	0.0171**
	(21.92)	(3.00)	(21.67)	(23.37)	(3.13)
d_2009	-0.116***	-0.125***	-0.0439***	-0.173***	-0.0185***
	(-21.93)	(-9.16)	(-20.14)	(-15.54)	(-8.08)
d_2009_19	-0.159***	0.235***	-0.0631***	-0.0148**	0.0339***
	(-15.64)	(9.33)	(-16.11)	(-2.84)	(6.85)
d_2009_20	-0.0612***	0.135***	-0.0244***	-0.0278***	0.0200***
	(-8.26)	(7.09)	(-8.19)	(-4.68)	(6.41)
N	1,304,562	683,396	1,304,562	683,390	683,396

Table 5: Short-Term Effects of CARD Act on the Availability of Credit Cards

Notes: 1) The omitted age category is 18-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: HASCARD takes the value 1 if the individual has a credit card. COSIGNCARD takes the value 1 if, conditional on having at least one credit card, the individual has a cosigned card with a positive balance. NCARDS is the number of credit cards the individual has conditional on having at least one credit card. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2008 and 2010. 7) The number of observations differs slightly for NCARDS than for COSIGNED because, occassionally, we are missing an observation for the number of cards but know that the individual has some balance that is cosigned.

	Probit		OLS		
	HASCARD	COSIGNCARD	HASCARD	NCARDS	COSIGNCARD
	(1)	(2)	(3)	(4)	(5)
d_19	0.502***	-0.140***	0.192***	0.298***	-0.0204***
	(55.37)	(-5.23)	(57.94)	(25.45)	(-3.98)
d_20	0.690***	-0.123***	0.265***	0.537***	-0.0183**
	(33.05)	(-3.78)	(32.69)	(24.95)	(-3.18)
d_21	0.747***	0.0242	0.286***	0.701***	0.00304
	(24.87)	(0.71)	(24.67)	(23.69)	(0.59)
d_22	0.801***	-0.00532	0.306***	0.869***	-0.00190
	(20.82)	(-0.12)	(20.68)	(26.11)	(-0.29)
d_23	0.853***	0.0460	0.326***	0.994***	0.00518
	(18.34)	(0.91)	(18.24)	(27.00)	(0.70)
d_24	0.898***	0.0650	0.342***	1.116***	0.00800
	(16.75)	(1.22)	(16.71)	(29.31)	(1.03)
d_2010	-0.159***	-0.0887***	-0.0595***	-0.309***	-0.0125***
	(-24.57)	(-4.75)	(-23.62)	(-24.26)	(-5.52)
d_2010_20	-0.202***	0.194***	-0.0806***	-0.0383***	0.0279***
	(-15.03)	(10.17)	(-14.63)	(-4.74)	(7.98)
d_2010_21	-0.0611***	-0.0281*	-0.0247***	-0.00779	-0.00473*
	(-6.49)	(-2.06)	(-6.72)	(-0.94)	(-2.05)
N	1,394,050	769,539	1,394,050	769,528	769,539

Table 6: Default and Self-Selection into Early Credit Card Use

Notes: 1) Only individuals 22 and 25 years old are included such that the omitted age category is 22-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card, respectively. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account (e.g., credit card account is in collections). 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2009 and 2012. 7) Only individuals aged 22 that got their first credit card at age 21 are included. 8) $\beta^{selection}$<0 indicates that young entrants are more likely to default than older entrants.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
$\beta^{selection}$	-0.142***	-0.155***	0.122***	-0.00761***	-0.00532***	0.0222***
	(-6.33)	(-5.26)	(5.43)	(-6.04)	(-4.84)	(4.36)
d_age25	-0.102***	-0.106***	0.193***	-0.00551***	-0.00346***	0.0391***
	(-5.86)	(-4.41)	(9.66)	(-5.21)	(-4.02)	(9.04)
d_year2012	-0.0695***	-0.146***	-0.106***	-0.00360***	-0.00499***	-0.0252***
	(-7.06)	(-9.63)	(-6.75)	(-6.71)	(-8.87)	(-6.75)
N	296,590	296,590	296,590	296,590	296,590	296,590

Table 7: Mortgages and Entry Age

Notes: 1) The omitted age category is 22-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variable takes the value 1 if the individual has a mortgage. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit	OLS
	(1)	(2)
d_age22_entryover20	-0.0877***	-0.00590***
	(-6.28)	(-6.57)
d_age23_entryover20	-0.0874***	-0.00861***
	(-6.91)	(-6.81)
d_age23	0.246***	0.0218***
	(33.04)	(13.49)
d_year2006	0.0135*	0.00116*
	(2.23)	(2.22)
d_year2007	0.00680	0.000701
	(0.59)	(0.72)
d_year2008	-0.0351*	-0.00265
	(-2.04)	(-2.00)
N	1,123,768	1,123,768

Table 8: Mortgages and Self-Selection into Early Credit Card Use

Notes: 1) Only individuals 22 and 25 years old are included such that the omitted age category is 22-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variable takes the value 1 if the individual has mortgage. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2009 and 2012. 7) Only individuals aged 22 that got their first credit card at age 21 are included. 8) $\beta^{selection}<0$ indicates that young entrants are more likely to have a mortgage than older entrants.

	Probit	OLS
	(1)	(2)
$\beta^{selection}$	-0.0727**	-0.0244***
	(-2.72)	(-9.83)
d_age25	0.696***	0.0555***
	(30.63)	(14.25)
d_year2012	-0.191***	-0.0290***
	(-16.08)	(-10.73)
N	293,254	293,254

Table 9: Entry Age and Default Later in Life

Notes: 1) The omitted entry age category is 24-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
d_entry18	-0.0503***	-0.0281*	-0.278***	-0.00337***	-0.00146*	-0.0704***
	(-4.46)	(-2.49)	(-23.51)	(-4.50)	(-2.59)	(-18.80)
d_entry19	-0.0119	-0.0218*	-0.196***	-0.000873	-0.00115*	-0.0464***
	(-1.06)	(-2.03)	(-20.35)	(-1.09)	(-2.10)	(-19.49)
d_entry20	-0.00682	-0.00698	-0.140***	-0.000535	-0.000433	-0.0314***
	(-0.66)	(-0.58)	(-13.13)	(-0.72)	(-0.68)	(-12.29)
d_entry21	-0.0142	-0.0221	-0.172***	-0.00105	-0.00118	-0.0389***
	(-1.67)	(-1.90)	(-17.30)	(-1.69)	(-1.92)	(-14.20)
d_entry22	-0.0370***	-0.0370***	-0.149***	-0.00263***	-0.00193***	-0.0338***
	(-4.10)	(-3.68)	(-16.65)	(-4.15)	(-3.68)	(-15.22)
d_entry23	-0.0244**	-0.0324**	-0.0873***	-0.00178**	-0.00171**	-0.0199***
	(-3.19)	(-2.85)	(-12.61)	(-3.19)	(-2.89)	(-10.62)
qtrs_exp	-0.00331*	-0.00646**	0.0582***	-0.000239*	-0.000332**	0.0136***
	(-2.35)	(-2.83)	(43.01)	(-2.41)	(-2.85)	(24.78)
qtrs_exp_sqd	0.0000433	0.000125	-0.00144***	0.00000333	0.00000663	-0.000323***
	(0.88)	(1.58)	(-28.84)	(0.98)	(1.68)	(-19.64)
d_year2006	0.00786*	0.0180**	0.0124*	0.000533*	0.000846*	0.00251
	(2.27)	(2.61)	(2.31)	(2.27)	(2.63)	(1.79)
d_year2007	0.0483***	0.0890***	0.0140	0.00343***	0.00454***	0.00217
	(8.52)	(11.38)	(1.90)	(8.01)	(9.95)	(1.10)
d_year2008	-0.0215**	0.0131	-0.0454***	-0.00141**	0.000625	-0.0132***
	(-3.16)	(1.29)	(-3.53)	(-3.21)	(1.29)	(-3.79)
N	2,644,852	2,644,852	2,644,852	2,644,852	2,644,852	2,644,852

Table 10: Entry Age and Default Later in Life, Experience in Categories

Notes: 1) The omitted entry age category is 24-year-olds and the omitted experience category is less than one year of experience with credit cards. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account. 5) We include a constant as well as state and year fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
d_entry18	-0.0529***	-0.0163	-0.266***	-0.00351***	-0.000830	-0.0671***
	(-4.71)	(-1.47)	(-21.72)	(-4.73)	(-1.49)	(-18.05)
d_entry19	-0.0105	-0.00286	-0.164***	-0.000777	-0.000209	-0.0390***
	(-0.92)	(-0.27)	(-16.66)	(-0.95)	(-0.37)	(-16.01)
d_entry20	-0.00427	0.00868	-0.125***	-0.000358	0.000363	-0.0281***
	(-0.41)	(0.71)	(-11.10)	(-0.48)	(0.55)	(-10.41)
d_entry21	-0.0140	-0.0135	-0.146***	-0.00103	-0.000735	-0.0331***
	(-1.64)	(-1.14)	(-14.02)	(-1.65)	(-1.15)	(-12.15)
d_entry22	-0.0375***	-0.0303**	-0.133***	-0.00265***	-0.00158**	-0.0301***
	(-4.26)	(-3.03)	(-15.15)	(-4.31)	(-2.97)	(-14.12)
d_entry23	-0.0246**	-0.0286*	-0.0858***	-0.00180**	-0.00151*	-0.0195***
	(-3.26)	(-2.52)	(-12.52)	(-3.25)	(-2.53)	(-10.50)
d_years_exp1	-0.0136	-0.0325**	0.323***	-0.00100	-0.00174**	0.0734***
	(-1.75)	(-2.82)	(51.99)	(-1.80)	(-2.78)	(31.31)
d_years_exp2	-0.0229**	-0.0630***	0.394***	-0.00164**	-0.00324***	0.0917***
	(-3.29)	(-6.12)	(45.40)	(-3.27)	(-5.80)	(25.04)
d_years_exp3	-0.0314***	-0.0827***	0.411***	-0.00224**	-0.00420***	0.0963***
	(-3.31)	(-5.97)	(43.40)	(-3.32)	(-5.67)	(26.53)
d_years_exp4	-0.0463***	-0.0905***	0.470***	-0.00326***	-0.00457***	0.113***
	(-5.18)	(-5.83)	(43.86)	(-5.02)	(-5.54)	(26.75)
d_years_exp5	-0.0606***	-0.0950***	0.541***	-0.00420***	-0.00478***	0.134***
	(-5.53)	(-7.30)	(42.70)	(-5.33)	(-6.74)	(24.06)
d_years_exp6	-0.0416***	-0.0914***	0.564***	-0.00296***	-0.00462***	0.140***
	(-3.76)	(-7.84)	(38.95)	(-3.74)	(-7.40)	(23.31)
d_years_exp7	-0.0184	-0.0426	0.597***	-0.00152	-0.00232	0.148***
	(-0.95)	(-1.78)	(32.93)	(-1.18)	(-1.91)	(23.63)
N	2,644,852	2,644,852	2,644,852	2,644,852	2,644,852	2,644,852

A Appendix

Table A.1: Default by Age, 19-to-23-Year-Old Individuals

Notes: 1) The omitted age category is 19-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account. 5) We include a constant and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
d_age20	-0.0137*	-0.0187**	0.192***	-0.00102*	-0.00105*	0.0398***
	(-2.16)	(-2.71)	(30.45)	(-2.15)	(-2.65)	(19.85)
d_age21	-0.0218**	-0.0348***	0.256***	-0.00161*	-0.00191**	0.0548***
	(-2.59)	(-3.45)	(24.37)	(-2.58)	(-3.33)	(18.78)
d_age22	-0.0375***	-0.0597***	0.294***	-0.00272***	-0.00317***	0.0640***
	(-4.34)	(-5.03)	(21.58)	(-4.20)	(-4.73)	(17.42)
d_age23	-0.0509***	-0.0764***	0.342***	-0.00363***	-0.00399***	0.0762***
	(-4.49)	(-6.08)	(24.19)	(-4.35)	(-5.60)	(17.64)
d_year2006	0.00910**	0.0331***	0.0304***	0.000625**	0.00163***	0.00677***
	(2.91)	(6.71)	(5.84)	(2.91)	(6.68)	(6.26)
d_year2007	0.0589***	0.0919***	0.0997***	0.00426***	0.00481***	0.0231***
	(11.53)	(12.56)	(14.50)	(10.54)	(11.14)	(16.62)
d_year2008	-0.0136**	0.0207*	0.110***	-0.000899*	0.00101*	0.0255***
	(-2.58)	(2.12)	(12.37)	(-2.56)	(2.12)	(12.78)
N	5,482,190	5,482,190	5,482,190	5,482,190	5,482,190	5,482,190

Table A.2: Default by Age, 19+ Year Old Individuals

Notes: 1) The omitted age category is 19-year-olds. 2) The numbers in parentheses are t-statistics computed using standard errors clustered by state. 3) ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for a two-sided test, respectively. 4) The dependent variables are defined as follows: 30DPD and 60DPD take the value 1 if the individual is 30 or 60 days delinquent on a credit card. SERIOUS takes the value 1 if the individual has a 90 day or greater delinquency or other serious derogatory incident on a credit card account. 5) We include a constant as well as year and state fixed effects (coefficients not shown). 6) All data are from the fourth quarter, years 2005-2008.

	Probit			OLS		
	30DPD	60DPD	SERIOUS	30DPD	60DPD	SERIOUS
	(1)	(2)	(3)	(4)	(5)	(6)
d_age20	-0.000337	-0.0227*	0.184***	-0.0000402	-0.00131*	0.0384***
	(-0.03)	(-2.09)	(22.98)	(-0.05)	(-2.12)	(18.09)
d_age21	-0.0105	-0.0352*	0.238***	-0.000782	-0.00200*	0.0513***
	(-1.25)	(-2.16)	(17.75)	(-1.28)	(-2.17)	(15.50)
d_age22	-0.0382***	-0.0796***	0.277***	-0.00273**	-0.00425***	0.0611***
	(-3.54)	(-4.56)	(15.98)	(-3.48)	(-4.29)	(13.72)
d_age23	-0.0419***	-0.0944***	0.324***	-0.00298**	-0.00495***	0.0733***
	(-3.45)	(-4.73)	(20.00)	(-3.37)	(-4.48)	(16.05)
d_age24	-0.0578***	-0.0957***	0.368***	-0.00404***	-0.00501***	0.0853***
	(-4.86)	(-5.26)	(18.75)	(-4.73)	(-4.95)	(14.93)
d_age25	-0.0558***	-0.0997***	0.402***	-0.00390***	-0.00519***	0.0946***
	(-4.21)	(-5.51)	(20.49)	(-4.08)	(-5.27)	(16.01)
d_age26	-0.0574***	-0.103***	0.393***	-0.00400***	-0.00532***	0.0921***
	(-4.27)	(-6.56)	(20.99)	(-4.14)	(-5.85)	(17.87)
d_age27	-0.0316*	-0.0883***	0.393***	-0.00225*	-0.00464***	0.0922***
	(-2.45)	(-4.94)	(21.90)	(-2.40)	(-4.61)	(18.04)
d_age28	-0.0353*	-0.0805***	0.393***	-0.00252*	-0.00426***	0.0921***
	(-2.32)	(-5.18)	(23.03)	(-2.30)	(-4.72)	(17.45)
d_age29	-0.0435***	-0.0805***	0.394***	-0.00306**	-0.00425***	0.0924***
	(-3.39)	(-5.83)	(26.26)	(-3.34)	(-5.44)	(19.30)
d_age30_34	-0.0267*	-0.0618***	0.434***	-0.00191*	-0.00333***	0.104***
	(-2.16)	(-5.05)	(27.30)	(-2.13)	(-4.72)	(17.99)
d_age35_39	-0.0174	-0.0526***	0.470***	-0.00126	-0.00287***	0.115***
	(-1.43)	(-4.04)	(31.43)	(-1.42)	(-3.85)	(19.09)
d_age40_44	-0.0296**	-0.0709***	0.483***	-0.00211**	-0.00379***	0.118***
	(-2.90)	(-5.02)	(30.97)	(-2.82)	(-4.61)	(21.72)
d_age45_49	-0.0446***	-0.0997***	0.424***	-0.00310**	-0.00517***	0.101***
	(-3.30)	(-6.34)	(25.39)	(-3.15)	(-5.65)	(19.54)
d_age50_54	-0.0893***	-0.139***	0.346***	-0.00600***	-0.00693***	0.0794***
	(-6.88)	(-10.04)	(19.04)	(-6.43)	(-8.36)	(16.40)
d_age55_59	-0.138***	-0.188***	0.259***	-0.00890***	-0.00892***	0.0567***
	(-11.98)	(-13.13)	(12.62)	(-10.38)	(-10.16)	(11.54)
d_age60_64	-0.195***	-0.243***	0.168***	-0.0119***	-0.0110***	0.0349***
	(-13.93)	(-13.27)	(6.81)	(-12.02)	(-10.70)	(6.80)
d_age65andabove	-0.365***	-0.420***	-0.0426	-0.0191***	-0.0160***	-0.00821
	(-24.73)	(-22.16)	(-1.34)	(-19.00)	(-15.00)	(-1.39)
N	4,653,240	4,653,240	4,653,240	4,653,240	4,653,240	4,653,240