Consumption, Credit, and the Missing Young*

Daniel Cooper[†] **Olga Gorbachev**[‡]

Federal Reserve Bank of Boston University of Delaware

María José Luengo-Prado[§]

Federal Reserve Bank of Boston

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Abstract

There are more young adults today with either no credit history or insufficient credit history to be scored by one of the major credit bureaus than there were before the Great Recession—a reality that is likely an unintended outcome of the CARD Act of 2009–10. In regressions that include a rich set of controls, we show that measures of young adults missing from credit bureau data act as a drag on state-level consumption growth. This finding seems to be driven by young individuals from more disadvantaged backgrounds having less access to credit since the legislation went into effect.

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[†]Federal Reserve Bank of Boston, 600 Atlantic Ave., Boston, MA, 02210, email: daniel.cooper@bos.frb.org.

[‡]University of Delaware, Alfred Lerner College of Business & Economics, 414 Purnell Hall, Newark, DE 19716, USA, email: olgag@udel.edu.

[§]Corresponding author. Federal Reserve Bank of Boston, 600 Atlantic Ave., Boston, MA, 02210, email: maria.luengo-prado@bos.frb.org.

1 Introduction

Access to credit is an important driver of consumption growth. This paper documents that a higher percentage of young adults have been missing from credit bureau records since the implementation of the Credit Card Accountability Responsibility and Disclosure (CARD) Act of 2009–10, and that their numbers only partially recovered by 2018. We call this phenomenon the "missing young" and demonstrate that indicators of missing young adults have predictive power for consumption growth at the state level, even after we include a rich set of controls that help explain differences in consumption growth across states.

Having a complete record in credit bureau data, including a credit score, is important for obtaining credit. Brevoort et al. (2015) document that 11 percent of adults in the United States in 2010 had no credit history or had insufficient credit history to have a credit score. Black and Hispanic individuals, along with individuals living in low-income neighborhoods, were more likely to be missing from credit bureau data. Individuals without credit histories or with insufficient credit history to be scored in credit bureau data face significant challenges in accessing most credit markets and have trouble developing the additional credit history necessary to obtain credit more easily in the future. In the past, opening a credit card was an easy way to start building a credit history: Brevoort and Kambara (2017) show that credit cards triggered the creation of consumer credit records more frequently than any other product across all age groups and income levels. While the CARD Act was meant to curtail deceptive and abusive credit card practices and contains many provisions that are beneficial to consumers, it may have also had unanticipated consequences for young adults.

In general, fewer young individuals than older individuals have a record in credit bureau data because the young are less likely to own a home or a car, or otherwise engage in purchases that involve credit.[1] Since it went into effect, the CARD Act has likely further

[1] A partially offsetting factor for differences in credit records across age groups in recent years has been

limited young people's initial access to credit by making it more difficult for individuals turning 18 years old to obtain a credit card. More specifically, a provision in the CARD Act (Title 3) prohibits credit cards from being issued to consumers under the age of 21 unless they have a co-signer (who shares liability for the credit card debt), or they submit financial information that demonstrates they have the means to meet their debt obligations.[2] The CARD Act also banned credit card issuers from sending young individuals pre-screened credit card offers, and introduced rules that have made it harder for colleges and universities to collaborate with credit card issuers in offering cards to their student body.

Despite the good intentions of this regulation, it may have adversely impacted young adults' ability to access credit and build a credit history. For example, Debbaut et al. (2016) document that individuals under the age of 21 were 15 percent less likely to have a credit card following the passage of the act. They also find that conditional on having a credit card, these young individuals had fewer total cards and were 35 percent *more* likely to have a co-signed card. In addition, the authors argue that their estimates represent "a lower bound of the effect of the act because its passage also likely reduced the representation of youth in the credit bureau data." Of course, identifying the direct effect of the CARD Act is difficult because one must separate the impact of the act on credit supply from a reduction in credit demand (or an increase in debt aversion) due to other events such as the Great Recession. Han et al. (2017), Nelson (2019), and Salisbury and Zhao (2019), among others, employ different strategies for disentangling these effects. This research shows that the act led to a significant reduction in the supply of credit to subprime individuals, among other findings.

Our research goes beyond Debbaut et al. (2016), who use credit bureau data to examine the effect of the CARD Act on young adults' ability to obtain (additional) credit cards and on the incidence of them having a co-signed card. Importantly, the authors focus their

the greater prevalence of student debt among younger cohorts.

[2]The CARD Act was passed in May 2009, and Title 3 compliance was required by February 2010.

analysis on young adults already in the credit bureau data. To our knowledge, our paper is the first to document how the fraction of young individuals *missing* altogether from credit bureau data has evolved since the CARD Act passed. Specifically, we analyze the effect of the CARD Act on young adults' ability to obtain credit in general and not just credit cards. Building a credit history when young, which often starts with credit card usage, has potential implications for obtaining a mortgage to buy a home and other forms of credit later in life.

In particular, using data from the New York Fed Consumer Credit Panel (CCP) provided by Equifax, we document that there are indeed fewer young adults in credit bureau data since the implementation of the CARD Act. This finding appears to be driven at least in part by reduced credit supply to young individuals of less privileged backgrounds. (Credit bureau data do not have demographic information other than age, and we use data from the National Longitudinal Survey of Youth to document this result.) Specifically, young individuals are more likely to have credit cards since the enactment of the CARD Act if they are in socieoeconomic groups deemed historically to be less of a credit risk, or if they have more affluent parents who can co-sign a card for them. We also consider the broader economic implications of these results and document a negative correlation between young individuals' more limited credit histories and state-level consumption growth, which suggests that a reduction in credit availability for young adults may have contributed to the slower-than-anticipated consumption growth in recent years. Additionally, we present IV estimations that allow us to move towards a more causal interpretation of our results. While the lingering consequences of the Great Recession had effects on demand that likely slowed consumption growth during the ensuing recovery period, our evidence suggests the CARD Act also played a role by restricting the supply of credit to young adults.

2 Data and Empirical Specification

We generate our measures of the missing young (MY) using data from the CCP provided by Equifax. The CCP is a longitudinal, nationally representative 5 percent random sample of individuals with credit records in the United States. The data are available quarterly (starting in 1999) and include information on most aspects of individuals' credit and debt holdings, including a credit score (Equifax Risk Score), the balance on credit cards, auto loans, student debt, and mortgages, as well as the person's birth year and geographical location. (The CCP data do not include information on interest rates.)

Our first measure of MY, "percent MY", compares the number of individuals in the census population data in a particular age group a (e.g., 18 to 34 years old), state i, and year t, to the count of individuals with a credit score in the CCP data in the same age group, state, and year.[3]

$$\text{Percent MY}_{it}^{a} = \left(1 - \frac{N_{it}^{\text{ccp},a}}{N_{it}^{\text{census},a}}\right) \times 100 \tag{1}$$

The top-left panel of Figure 1 shows that, on average, from 2000 to 2007, roughly 20 percent of adults aged 18 to 34 had insufficient credit histories to have a credit score (unscored) or were missing altogether from the CCP data. Starting with the Great Recession and accelerating with the implementation of the CARD Act, the percentage of young individuals who were unscored or lacked any credit history increased. In addition, while percent MY declined somewhat after peaking in 2012 (as the economy recovered), it remained elevated relative to the period before the CARD Act, suggesting that the act potentially has had some lasting effects on young individuals' access to credit. Importantly, this measure of MY exhibits substantial variation across states and over time, as shown in the bottom panel of

[3]Counts in the CCP are multiplied by 20, because the CCP is a 5 percent random sample of individuals in the United States.

Figure 1. (The maps in Figure A.1 in the appendix further demonstrate the geographic variation in this measure.)

In later analysis, we split this 18- to 34-year-old young-adult group into narrower age ranges to exploit variation in their exposure to the act (18 to 24, 25 to 29, and 30 to 34 years old). The top-right panel of Figure 1 depicts the evolution of percent MY for these groups. Rather than depicting cohorts, each point on a given line represents percent MY for that specific age group at that point in time. 30- to 34-year-olds are unaffected by the act, so the evolution of percent MY for this group cannot be attributed to the passage of the act. The 25-to-29-year-old group starts to include potentially treated individuals by 2015, and as time passes more individuals in this group are affected. The growing trend differential between 25- to 29-year-olds and 30- to 34-year-olds post-2015 points to the long lasting impact of the act. Finally, all 18- to 24-year-olds are potentially affected by the act by 2015. Although the evolution of percent MY for this young age group diverges from that of 25- to 29-year-olds (differences likely attributable to the introduction of financial education mandates in high school that mostly affected this youngest age group in recent years), percent MY has not returned to its pre-recession level for this group either—consistent with persistent effects of the act. We exploit variation in exposure to the CARD Act across these groups of young adults later in our analysis, and find that 25- to 29-year-olds are driving the correlation between MY and consumption growth.

We also consider an alternative measure, "ratio MY", which weights percent MY by the share of individuals in each aforementioned age group ("a") relative to all individuals aged 18 to 65 in the state, based on census population data.

$$\text{Ratio MY}_{it}^{a} = \text{Percent MY}_{it}^{a} \times \frac{N_{it}^{\text{census},a}}{N_{it}^{\text{census},18-65}} \tag{2}$$

This measure accounts for the relative importance of younger age groups in a state's overall

working-age population.[4] We depict ratio MY (for 18- to 34-year-olds) in the top-left panel of Figure 1 (the red dashed line). Its evolution parallels that of percent MY.

We conjecture that the more limited access to credit for young consumers, as proxied by their absence from credit bureau data, may have played a role in the slow recovery in consumption following the Great Recession, all else being equal. Still, we recognize that the variation in our missing-young measures may not be a completely exogenous indicator of credit availability for young adults over time, as these individuals' credit demand may fluctuate for various reasons. For example, if job prospects are grim, young individuals may postpone major purchases and credit applications by choice, which would delay their entrance into credit bureau records. While this caveat is relevant, our regressions include time fixed effects, along with other controls, to try to account for changing credit demand. We also employ an instrumental variable approach to identify individuals potentially treated by the act.

For our analysis, we combine state-level consumption data from the Bureau of Economic Analysis (BEA) with our measures of MY. (The variation in consumption growth across states is depicted in appendix Figure A.2.) Nominal state-level consumption data are available at an annual frequency from 1997 through 2018, and spending can be disaggregated based on major expenditure categories. We compute per capita expenditure growth using annual state-level population data, and nominal values are converted to real values using the CPI.

Our empirical specification is similar to the one in Demyanyk et al. (2019) and relates consumption growth to consumers' available resources as well as to measures of uncertainty and access to credit, in the vein of Carroll et al. (2012). Both papers are based on the Carroll

[4]The average working-age population share of 18- to 34-year-olds is 37 percent for the US as a whole over our sample period, with limited time variation. However, there is significant (and persistent) variation across states in these averages (e.g., 31 percent in Maine and 46 percent in Utah).

(1997) and Deaton (1991) buffer-stock model of saving, in which prudent but impatient consumers, subject to uncertainty and credit constraints, target a certain level of wealth for precautionary reasons. In this model, available resources, uncertainty, and the tightening or easing of credit constraints affect the saving rate and consumption growth in three ways: (1) additional uncertainty increases the desired wealth target for precautionary reasons, and thus it increases the saving rate; (2) credit tightening also increases the desired wealth target and the saving rate; and (3) additional resources from, for example, a rise in asset prices increase consumption and lower saving—because the precautionary motive diminishes with wealth.

Our regressions take the following form:

$$\begin{aligned} \Delta \log(c_{it}) &= \alpha_i + \mu_t + \beta_y \, \Delta \log(y_{it}) + \beta_h \, \Delta \log(h_{it}) \\ &\quad + \beta_u \, \Delta u_{it} + \beta_{cf} \, \Delta \text{conf}_{rt} + \beta_{cs} \, \text{cs}_{it} + \beta_{my} \, \text{my}_{it} + \varepsilon_{it}, \end{aligned} \tag{3}$$

where Δ captures the change in a variable between periods, the subscript i represents a given state, and the subscript t denotes a given year. All specifications include state fixed effects (α_i) and year fixed effects (μ_t); c is real consumption per capita, y is real disposable income per capita (from the BEA), and h denotes housing prices (as measured by CoreLogic). The latter two variables are our proxies for consumer resources at the state level.[5] In addition, u (the unemployment rate from the Bureau of Labor Statistics) and "conf" (the Conference Board Consumer Confidence Index [CCI] available for nine census regions) are our proxies for economic (or consumer) uncertainty.[6]

To this standard set of controls we add two variables relating to access to credit. The

[5]Ideally, one would control for differences in financial resources in this type of consumption specification, but measures of financial asset holdings at the state level are not available. However, any common variation in financial resources over time will be picked up by the time fixed effect.

[6]We use the expectations component of the CCI, which incorporates expectations about business conditions, employment conditions, and family income six months ahead.

variable "cs" is the average (state-level) credit score (Equifax Risk Score),[7] while "my" proxies for access to credit (or lack of) for the young, as captured by either of our MY indicators. Standard errors are clustered at the state level, and all estimates are population weighted at the state level. Since the CCP data are only available from 1999 onward, and the BEA consumption data are annual, our analysis sample is annual and covers the period from 2000 through 2018. Summary statistics and correlations for the variables included in our regressions are shown in appendix Tables A.1 and A.2.

3 Results and Discussion

Table 1 summarizes our main results. We estimate a marginal propensity to consume (MPC) for total spending out of (disposable) income of 16 cents to 17 cents, depending on the specification (see columns [1] and [2]). These estimates are in line with existing studies that follow a similar approach.[8] For example, Demyanyk et al. (2019) estimate an MPC out of income of 0.22 using county-level data, and Fisher et al. (2019) find an MPC of around 0.1 using household-level data, which is similar to the results in Dynan (2012).[9]

In addition, 10 percent higher house-price growth leads to 0.3 to 0.4 percent higher (total) spending growth, and an increase in the unemployment rate of 1 percentage point is associated with 0.26 to 0.27 percentage point lower consumption growth. We interpret the latter effect as the impact of additional uncertainty on consumption growth, because the income decline associated with job loss should already be captured by the income-growth variable. In terms of the more disaggregated spending categories, we find that the MPC out of income is higher for durables than nondurables and services (NDS), and that higher

[7] We use the terms "credit score" and "risk score" interchangeably.

[8] We do not attempt to separate permanent and transitory income components. We also have many more controls than other studies.

[9] Most estimates of the aggregate MPC out of income range between 0.2 and 0.6—see Carroll et al. (2017) for a summary.

house-price growth results in a larger durable-spending response (see columns [3] and [4]).[10] The uncertainty effect (as captured by the unemployment rate) is also larger for durables than NDS, because durables spending is easier to postpone. In addition, changes in the level of consumer confidence do not have a statistically significant effect on total consumption growth, as it seems that increases in confidence are associated with a shift from NDS spending toward spending on durables.[11] Also, consumption growth was faster in states with higher average credit scores over the sample period. In particular, a 10 percent higher average risk score is associated with 0.5 percent higher spending growth—an effect that appears to operate mainly through NDS spending. To the extent that credit scores proxy for credit access, this result suggests that credit availability has independent predictive power for state-level consumption growth.

Turning to our main result, a state where fewer young individuals aged 18 to 34 appear in credit bureau records has slower total consumption growth than a state with relatively more young adults appearing in credit bureau data. Much of the MY effect on consumption works through spending on NDS as opposed to durables. It is likely that the young buy relatively more NDS than durable goods. That MY matters relatively more for NDS spending is also consistent with young consumers using credit for house purchases, since the flow from housing services is included in the NDS category, and young individuals typically use credit in large part to buy homes. Furthermore, it may be relatively easier to obtain loans (with limited or no credit history) for durables that can be more easily repossessed (e.g., cars).[12]

According to the estimates in column (1) of Table 1, as percent MY rises by one percent-

[10]The durables category includes vehicles, furnishings, household equipment, and other durables. Nondurables and services cover all other spending, including housing services.

[11]Keep in mind that our measure of consumer confidence has less variation than the other regressors, since it is not available at the state level (availability is for nine (census) regions only).

[12]A recent report by the Federal Reserve Bank of NY (2019) supports this claim. Auto loan originations for 18- to 29-year-olds have fully recovered to pre-recession levels, while mortgage originations have not.

age point, spending growth is expected to fall by 0.05 percent. We discuss the relative size of the effect later on after presenting IV estimates that control for the potential endogeneity between our missing young measure and spending growth. Still, if more limited access to credit for young adults is the new normal, our estimates imply that consumption growth may be below the level suggested by models that do not account for young individuals' access to credit.

Is access to credit for the young more limited now than in the past?

Our indicators of MY do not allow us to determine whether young adults cannot get credit, are discouraged from applying for credit, or do not want credit. Credit may be available, but (young) people may not seek it out the way they did in the past for precautionary reasons or other factors. That is, we cannot easily separate credit demand from credit supply. Nevertheless, we present some additional evidence that is consistent with the CARD Act likely hindering younger individuals' access to credit.

Title 3 of the CARD Act was supposed to improve the financial health of young adults by both reducing predatory lending and limiting overborrowing by consumers due to financial mistakes. Since the act's introduction, the distribution (inter-quartile range) of credit scores for individuals likely affected by the act has compressed; the same is not true for (older) unaffected age groups. In particular, the distribution of credit scores for 20-year-olds shifted up and narrowed after 2009, with the average score rising from 652 in 2006 to 670 in 2018 and the standard deviation declining from 55 to 42. In contrast, the distributions of credit scores for individuals ages 30, 40, and 50 remained relatively stable over time (see Figure 2). The improved creditworthiness of 20-year-olds since the enactment of CARD Act is consistent with lenders generally providing credit to more appealing young borrowers, or more affluent young individuals obtaining credit through their parents co-signing credit card offers or other means.

Additionally, we compare individuals aged 27 and 30 in 2018 with individuals of the same age in 2006. Twenty-seven-year-olds in 2018 were affected by the CARD Act (the oldest impacted cohort), while 30-year-olds were not (the youngest non-impacted cohort).[13] We find that a 27-year-old in 2018 opened his/her first credit account about 6.4 months later, on average, than a 27-year-old in 2006 (see Table 2, column [1]).[14] This result is consistent with the CARD Act possibly delaying access to credit for affected young adults. Lower delinquency rates for 27-year-olds in 2018 relative to 2006 also point to a more qualified (likely more affluent) pool of young borrowers (column [2]). In addition, both 27- and 30-year-olds in 2018 were less likely to hold a mortgage compared with individuals of the same age in 2006, but the difference in mortgage holding between the two age groups narrowed in 2018 relative to 2006 (column [3]). Moreover, while the CCP risk scores of both age groups are higher in 2018 than in 2006, 27-year-olds in 2018 do not have lower credit scores than 27-year-olds in 2006, despite the former group's relatively shorter credit histories (column [4]). On the surface, this finding suggests the CARD Act has had little impact on young adults' credit scores. However, a more pessimistic interpretation of this result is that a compositional change occurred, and young individuals who would have started with lower credit scores were excluded from traditional credit channels, and hence credit bureau records, following the act.

We see some evidence of such a compositional shift using mortgage data. In particular, we use data from Credit Risk Insight Servicing McDash (CRISM) to determine whether young individuals who obtain mortgage loans after the CARD Act pay relatively higher interest rates for their loans. The CRISM database contains credit bureau data on nearly 79 million individual consumers, matched by Equifax to mortgages in the McDash/LPS servicing data.

[13]We use 2006 as the pre–CARD Act comparison year to avoid any adverse effects of the Great Recession on individuals' credit histories. Using individuals in these age groups from 2004 or 2005 instead, or using all three years together, as the comparison group yields similar results.

[14]In these difference-in-difference regressions, we control for state fixed effects and cluster the standard errors by state. Including additional controls, such as state-level unemployment rates, does not alter our findings.

We restrict our analysis to purchase loans for primary residences taken by 27- and 30-year-olds in 2006 and 2018. In this sample of purchase loans, 31 (29) percent of the loans belong to 30- (27-) year-olds in 2006, and 22 (18) percent belong to 30- (27-) year-olds in 2018. The significant decline in mortgage originations for these young individuals over time cannot be solely attributed to the act, but it is nevertheless remarkable. Importantly, the decline in mortgage originations was significantly larger for 27-year-olds. Further, we run regressions with the mortgage interest rate as the dependent variable, while controlling for credit scores at origination, loan-to-value ratios, type and term of the loan, whether PMI was required, as well as state fixed effects. We find that 27-year-olds in 2018, while paying much lower interest rates on mortgage debt on average than in 2006 given the evolution of mortgage rates over the period, pay about 4 basis points more for their loans than 27-year-olds in 2006 on a relative basis (see Table 2, column [5]).[15] While this differential effect is small, 27-year-olds purchasing homes in 2018 are likely a highly selective group.

Our MY measures are also highly correlated with state-level poverty rates, and the correlation has strengthened since the CARD Act went into effect. Between 2000 and 2009, the raw correlation of the poverty rate and percent MY (18-to-34 years old) is 0.34, while the correlation after 2009 is 0.44. In addition, when we regress percent MY on the poverty rate, allowing for a differential effect after 2009 in regressions that also include state and time fixed effects, we obtain a significant coefficient for the post-2009 period (see Table 3, column [1]).

Using data on a sample of individuals whose mothers are members of the National Longitudinal Survey of Youth of 1979, we further document a decline in the share of young adults with credit cards immediately after the act. The share partially rebounds in subsequent years, but does so in an uneven fashion. The recovery was slower for non-white (especially

[15]The estimated effect is 5 basis points when controlling only for state fixed effects, and 2 basis points if we add loan type fixed effects (e.g., FHA, VA, conventional).

Hispanic) young adults and those with lower-income parents (see section A.2) and Figure A.3 in the Appendix for more details). Overall, these patterns are consistent with credit availability being more limited in the years since the enactment of the CARD Act for younger individuals who may be fairly or unfairly perceived as riskier borrowers.

Separately, we also find that the degree of exposure to financial education across states and over time correlates with our MY measures. This result comes from first measuring financial education exposure using data on the various financial education mandates that are part of high school graduation requirements across states; see Urban and Schmeiser (2015). We classify an individual in a given state as (likely) exposed if a financial education requirement for high school graduation was in place when that individual was 15 years old.[16] A higher share of young adults who were exposed to a personal finance curriculum is associated with a lower percent MY after the CARD Act took effect (see Table 3, column [2]). Quantitatively, having a one-standard-deviation higher share of young adults who were exposed to financial education is associated with a 0.64 to 0.7 percentage point lower share of MY. This result suggests that financial education has been important in helping young adults navigate the post-CARD Act environment and obtain credit—consistent with the idea that accessing credit has become more difficult for young adults.

Towards a causal interpretation of the consumption growth results

As noted earlier, our consumption growth regressions do not necessarily identify a causal relationship between consumption and access to credit. Our indicators of MY could be correlated with omitted variables such as expectations of income growth for young adults. With lower expected income growth, lenders will likely assume higher default probabilities,

[16]Using a similar approach, Stoddard and Urban (2019) find that financial education graduation requirements shifted college students from high-cost to low-cost college financing—a result that demonstrates the potential power of personal finance education at a young age. Brown et al. (2016) also study the effects of exposure to financial training on debt outcomes in early adulthood.

making them less willing to lend to young adults or other consumers with limited credit histories. At the same time, consumers may reduce their demand for credit and otherwise decrease their consumption in response to their lower (actual or perceived) income growth.

Our regressions include multiple state-level controls as well as time fixed effects to capture the aggregate state of the economy, and ameliorate some of these concerns. However, we also take an instrumental variable approach and construct an instrument that we believe separates the credit supply changes affecting our measures of MY from confounding demand factors. The instrument is based on the fraction of young individuals in a given state potentially affected by the CARD Act, combined with the degree of financial education and the share of parents *unlikely* to be able to co-sign loans in that state.[17]

First, we calculate the fraction of potentially affected individuals aged 18 to 34 in a given state and year (PA_{it}) using census population data. Before 2010, no individuals are potentially affected by the act, but starting in 2010, 18- to 20-year-olds are potentially affected, with 18- to 21-year-olds potentially impacted in 2011, and so on until 2018 when all 18- to 28-year-olds are potentially affected.[18] Given that we include both state and year fixed effects in our regression specification, variation in the share of potentially affected individuals alone is unlikely to produce a strong first stage. Moreover, not all potentially affected individuals are likely to be "treated" by the act. For instance, potentially affected young adults may be untreated if their parents can co-sign for credit cards or other loans (or provide housing down payment assistance). Therefore, we construct a measure of the fraction of individuals with no such parents using the fraction of subprime individuals aged 50 and older (potential parents) by state and year as a proxy. Our hypothesis is that "subprime

[17]Recent work by Goodman et al. (2020) documents an important link between socioeconomic conditions and credit records for college educated young adults, lending support to the validity of our instrument.

[18]$\text{PA}_{it} = 0$ if $t < 2010$; PA_{it} = no. 18–20/no. 18–34 if $t = 2010$; PA_{it} = no. 18–21/no. 18–34 if $t = 2011$; PA_{it} = no. 18–22/no. 18–34 if $t = 2012$; and so on.

parents" (SP) may not be able to help their offspring obtain credit.[19] Further, exposure to a financial education curriculum may help young adults learn how to start building credit without a credit card, or how to circumvent some of the act's restrictions, by, for example, obtaining a secured credit card. Using the state-level financial mandate data previously discussed, we calculate the fraction of individuals not exposed to financial education in high school by state and year (NoF_{it}). Our instrument is the product of the three terms just discussed: $\text{Treat}_{it} = \text{PA}_{it} \times \text{SP}_{it} \times \text{NoF}_{it}$. In Appendix A.3, we present results that show the robustness of our findings to using variations of this instrument, as well as a visualization of the instrument's components.

Table 4 summarizes our IV estimates using percent MY.[20] We continue to find that a larger percent MY is associated with lower consumption growth (see columns [2] and [3]). Note the IV estimate is larger than the OLS estimate as it picks up the fact that only a fraction of measured MY individuals are treated—about 0.26 in our sample. Columns (4)–(6) report results for regressions considering narrower age groups (18 to 24, 25 to 29, and 30 to 34) and show that the effect of MY on consumption growth is driven mostly by 25- to 29-year-olds.[21] This finding is consistent with the implementation of the CARD Act being responsible for the negative correlation between consumption growth and percent MY, since individuals aged 30 to 34 were not affected by the act and individuals aged 18 to 24 are likely too young to demand a lot of credit. Access to credit should also be more important for young adults' spending when they start living on their own, which happens later in life nowadays (see Cooper and Luengo-Prado 2018 for a discussion on changes in household formation patterns).

[19]The CARD Act led to a reduction of credit to subprime individuals for reasons unrelated to Title 3, so the act could have also worked indirectly by reducing the supply of credit to subprime parents; see, for example, Han et al. (2017).

[20]Results are similar for the MY ratio measure (not reported for brevity).

[21]In the IV specifications, we modify the instrument to be specific to the 25-to-29-year-old group.

Our IV specifications do not control directly for the share of subprime parents or the degree of financial education in a state. SP_{it} is highly correlated with our average credit score variable (raw correlation of 0.94), and we found no evidence of a direct effect of financial education on consumption growth. Table 5 shows that using the share of subprime parents as a control instead of average credit scores delivers similar results (columns [1] and [5]), and that controlling for financial education directly is neither economically or statistically significant (columns [2] and [6]).

Since the enactment of the CARD Act occurred at the end of the Great Recession, there are additional threats to identification. For one, recessions affect individual and household income growth. Most studies estimate that the negative effects on earnings for individuals entering the labor market during times of high unemployment are long lasting (see Genda et al. 2010; Kahn 2010; Oreopoulos et al. 2012; Speer 2016; Altonji et al. 2016; Rothstein 2020; Schwandt and von Wachter 2019). The impact on earnings is larger for individuals without a college degree, women, and non-white individuals. However, household income falls significantly less than earnings for disadvantaged groups due to the increased reliance on public safety nets (Schwandt and von Wachter 2019). Also, the earnings effects are less persistent for less educated individuals (Genda et al. 2010; Speer 2016), effects lasting 1 to 3 years compared with 5 to 10 years for more educated workers. The differential income effect for individuals without a college degree poses a challenge to identification because less educated individuals tend to come from more modest backgrounds. These individuals are also more likely to be treated by the CARD Act due to potentially more limited access to credit co-signers and alternative funding sources. Given that our analysis extends to 2018, well beyond the official end of the Great Recession, it is unlikely that our results are simply driven by the decline in earnings for less educated and socially disadvantaged individuals. However, we cannot fully rule out some impact of the Great Recession on consumption

growth due to a credit demand reduction stemming from income effects.[22]

Beyond the effects on earnings, recessions may "scar" consumption via negative income expectations and changes in risk aversion that may result in higher precautionary savings. Malmendier and Shen (2018), using micro-level data, find that households who live through times of high unemployment, or who have experienced more personal unemployment spells, spend significantly less on food and total consumption, after controlling for income, wealth, employment, demographics, and other (macroeconomic) factors. To determine whether unemployment experience, as defined in that study, affects our results, we include the unemployment experience of young individuals at the state level as an additional control in our analysis.[23] Including unemployment experience does not affect our results, and the measure itself is not significant—see columns (3) and (7) of Table 5. Also, our regressions already control for regional consumer expectations, as past experiences likely affect consumers' current outlooks.[24] As an additional robustness check that more directly addresses potential income effects of the Great Recession on young adults, we interact the share of individuals 18 to 34 years old in a given state with dummy variables for years corresponding to the pre-Great Recession period, the Great Recession period, and the post-Great Recession period. We find that during and following the Great Recession, a higher share of young individuals predicts lower consumption growth (see columns (4) and (8) of Table 5). However, these additional controls do not affect the estimated coefficient on percent MY, which implies that

[22]Nevertheless, we do not find evidence of a differential credit demand decline for young adults affected by the CARD Act in the Survey of Consumer Finances (SCF). In particular, we run difference-in-difference regressions similar to those in Table 2. We find that individuals in the younger group, who were potentially treated by the CARD Act, were marginally less likely to hold a credit card but were no less likely to apply for credit. See Table A.4 in the Appendix for details.

[23]Following the overall approach in Malmendier and Shen (2018), we use age-based unemployment rates and population shares to construct state-level unemployment experience measures for individuals aged 18 to 34.

[24]As noted earlier, the consumer expectation data are unfortunately not available at the state level or by age group.

our estimated CARD Act effect on consumption growth via reduced credit access for young adults cannot solely be driven by scarring of income, income expectations, or consumption.

Further Discussion

It is worth considering whether our estimated percent MY effect on consumption growth is economically significant and/or sensible. To do so, we use the reduced-form and IV-estimates from columns (2) and (3) in Table 4 to predict how much higher consumption growth would have been in 2018 if percent MY remained at its 2010 level. We choose 2010 for this exercise because it might be unreasonable to assume that percent MY would go back to pre-recession levels if the Great Recession has had permanent effects on credit demand or credit supply for reasons unrelated to the CARD Act as we have discussed. Following this approach, we predict that consumption growth in 2018 would have been 0.19 (reduced form) to 0.20 (IV) percent higher if the MY measure remained at its 2010 level. In other words, consumption growth would have been 2.2 percent instead of roughly 2 percent (the actual rate) in 2018.[25] Based on our calculations using data from the Consumer Expenditure Survey (CEX), households headed by individuals aged 18 to 34 account for roughly 19 percent of total spending during our sample period. (The actual spending share could be higher given that spending by 18- to 34-year-olds who live with their parents, and are thus not household heads, are not captured in this calculation.) Moreover, consumption growth tends to be higher for younger households than other segments of the population.[26] At first glance, the estimated effect might seem large given the spending share of the young and the fact that not all young individuals in this age group are missing from credit bureau data. However, percent MY likely proxies for credit barriers affecting young consumers more generally due

[25]The effects would be much larger if we use the estimates in columns (5) and (6) that use percent MY 25–29, but these estimates are also less precisely estimated.

[26]Household-level regressions with age-group dummies, and utilizing the (short) panel dimension of the CEX, indicate that households with heads ages 25 to 29 have the highest consumption growth over our sample period.

to their delayed entry intro credit bureau records.

Possible mechanisms for the negative correlation between MY and consumption growth could be direct (not being able to borrow via credit card debt) or indirect (the lack of a credit record could make obtaining other loans more difficult or costly). So far we have provided evidence of indirect effects: the young affected by the act pay slightly higher rates on mortgage loans. Ideally, we would like to study loan denial rates following the act to examine possible indirect effects further. However, the Home Mortgage Disclosure Act (HMDA) data, which are typically used to study loan denial rates, do not have information on the age of applicants until 2018.[27] In addition, the direct effect of young individuals not being able to borrow via credit cards is potentially large. Credit card limits relative to income for young individuals are non-negligible. Interestingly, while credit card limits have changed only marginally (in nominal terms) for those with a credit card, the spending limit as a share of income fell substantially between 2006 and 2018. Moreover, credit card limits as a share of income increase with age, potentially reflecting the fact that it takes time to build credit histories and obtain higher credit-line limits (see Table A.5.) At the same time, young adults' utilization rate of credit cards is relatively high, which points towards young individuals with access to credit cards using them frequently to either transact, smooth consumption, or to finance life-cycle spending.[28] If fewer such individuals have access to credit cards and other forms of credit, it is natural to expect lower consumption growth.

[27]The 2018 HMDA dataset with detailed age information is not yet available to us. Another possibility is to investigate incomplete or fragmented credit files from credit bureau records, but we leave this approach for future research.

[28]While credit card balances in credit bureau data do not necessarily represent revolving credit, average credit card utilization rates (credit balance relative to credit limit) for young individuals appearing in credit bureau data (47 percent in 2018) are higher than for older individuals (39 percent). Relative to 2006, credit utilization is down for young individuals (56 percent rate in 2006), which again might point to compositional changes in the pool of individuals with access to credit.

4 Concluding Remarks

Consumers with limited credit histories face challenges accessing credit markets. In the past, credit cards triggered the creation of consumer credit records more frequently than any other product. The introduction of the CARD Act in 2010, which made it harder for individuals younger than 21 to obtain credit cards, likely has had some long-lasting effects on young adults' access to credit. We document that there are more young adults who are missing from credit bureau data today than there were before the Great Recession, and we show that young individuals' reduced access to credit is a drag on state-level consumption growth, even after we account for typical drivers of consumer spending. With the measures of young adults missing from credit bureau records remaining elevated, the drag on consumption could continue. We provide evidence that the elevated percent MY level is due, at least in part, to credit supply effects and not just reduced credit demand by young adults. In particular, since the enactment of the CARD Act, there appears to be less credit among more socioeconomically disadvantaged young adults, and among young adults who are less financially literate.

Our research highlights the need to continue to find ways for young adults to more easily signal their creditworthiness. In the meantime, more financial education is important for helping these consumers build credit histories early in their adult lives, before their need for credit (to buy a house or other large-ticket items) increases substantially. Indeed, the more limited credit (or slower development of credit histories) for young adults that followed the implementation of the CARD Act has important implications for wealth accumulation to the extent that it forces young people to wait longer to purchase their first home.

Further research could exploit micro-level data or additional aggregate variation using, for example, MSA- or county-level spending data to further disentangle the effects of the CARD Act from those related to the Great Recession. Unfortunately, MSA or county-level

expenditure data are not currently available to us over the relevant time horizon. Also, research using micro-level analysis could be complicated by the fact that most commonly available datasets focus on spending at the household level, and fewer young adults have been forming households recently. In other words, part of the effect we are finding may be reflecting the lower rate of household formation by young adults—something we plan to explore further in future research.

References

Altonji, J. G., L. B. Kahn, and J. D. Speer (2016). Cashier or consultant? Entry labor market conditions, field of study, and career success. *Journal of Labor Economics 34*(S1), S361–S401.

Brevoort, K. P., P. Grimm, and M. Kambara (2015, May). CFPB Data Point: Credit Invisibles. Working paper, The CFPB Office of Research.

Brevoort, K. P. and M. Kambara (2017, June). CFPB Data Point: Becoming Credit Visibles. Working paper, The CFPB Office of Research.

Brown, M., J. Grigsby, W. van der Klaauw, J. Wen, and B. Zafar (2016, 09). Financial Education and the Debt Behavior of the Young. *The Review of Financial Studies 29*(9), 2490–2522.

Carroll, C., J. Slacalek, K. Tokuoka, and M. N. White (2017). The Distribution of Wealth and the Marginal Propensity to Consume. *Quantitative Economics 8*(3), 977–1020.

Carroll, C. D. (1997). Buffer-Stock Saving and the Life Cycle/Permanent Income Hypothesis. *The Quarterly Journal of Economics 112*(1), 1–55.

Carroll, C. D., J. Slacalek, and M. Sommer (2012). Dissecting Saving Dynamics: Measuring Wealth, Precautionary, and Credit Effects. Technical report.

Cooper, D. and M. J. Luengo-Prado (2018). Household Formation over Time: Evidence from Two Cohorts of Young Adults. *Journal of Housing Economics 41*(September), 106–123.

Deaton, A. (1991). Saving and Liquidity Constraints. *Econometrica 59*(5), 1221–1248.

Debbaut, P., A. Ghent, and M. Kudlyak (2016). The CARD Act and Young Borrowers: The Effects and the Affected. *Journal of Money, Credit and Banking 48*(7), 1495–1513.

Demyanyk, Y., D. Hryshko, M. J. Luengo-Prado, and B. E. Sorensen (2019). The Rise and Fall of Consumption in the 2000s: A Tangled Tale. *Economica 86*(343), 495–531.

Dynan, K. (2012). Is a Household Debt Overhang Holding Back Consumption. *Brookings Papers on Economic Activity 43*(1 (Spring), 299–362.

Federal Reserve Bank of NY (2019). Quarterly Report on Household Debt and Credit. Research and Statistics Group.

Fisher, J., D. Johnson, T. Smeeding, and J. P. Thompson (2019). Estimating the Marignal Propensity to Consume Using the Distributions of Income, Consumption, and Wealth. Working Paper 4, Federal Reserve Bank of Boston.

Flood, S., M. King, R. Rodgers, S. Ruggles, and J. R. Warren (2020). Integrated Public Use Microdata Series, Current Population Survey: Version 7.0 [dataset]. Minneapolis, MN: IPUMS, https://doi.org/10.18128/D030.V7.0.

Genda, Y., A. Kondo, and S. Ohta (2010). Long-Term Effects of a Recession at Labor Market Entry in Japan and the United States. *The Journal of Human Resources 45*(1), 157–196.

Goodman, S., A. Mezza, and A. H. Volz (2020). On intergenerational immobility: Evidence that adult credit health reflects the childhood environment. *Economic Inquiry 58*(2), 780–801.

Han, S., B. J. Keys, and G. Li (2017, 10). Unsecured Credit Supply, Credit Cycles, and Regulation. *The Review of Financial Studies 31*(3), 1184–1217.

Kahn, L. B. (2010). The long-term labor market consequences of graduating from college in a bad economy. *Labour Economics 17*(2), 303 316.

Malmendier, U. and L. S. Shen (2018, June). Scarred Consumption. NBER Working Papers 24696, National Bureau of Economic Research, Inc.

Nelson, S. (2019). Private Information and Price Regulation in the US Credit Card Market. Working paper.

Oreopoulos, P., T. von Wachter, and A. Heisz (2012). The short-and long-term career effects of graduating in a recession. *American Economic Journal: Applied Economics 4*(1), 1–29.

Rothstein, J. (2020). The Lost Generation? Labor Market Outcomes for Post Great Recession Entrants. Working Paper 27516, National Bureau of Economic Research.

Salisbury, L. C. and M. Zhao (2019). Active Choice Format and Minimum Payment Warnings in Credit Card Repyament Decisions. Working paper.

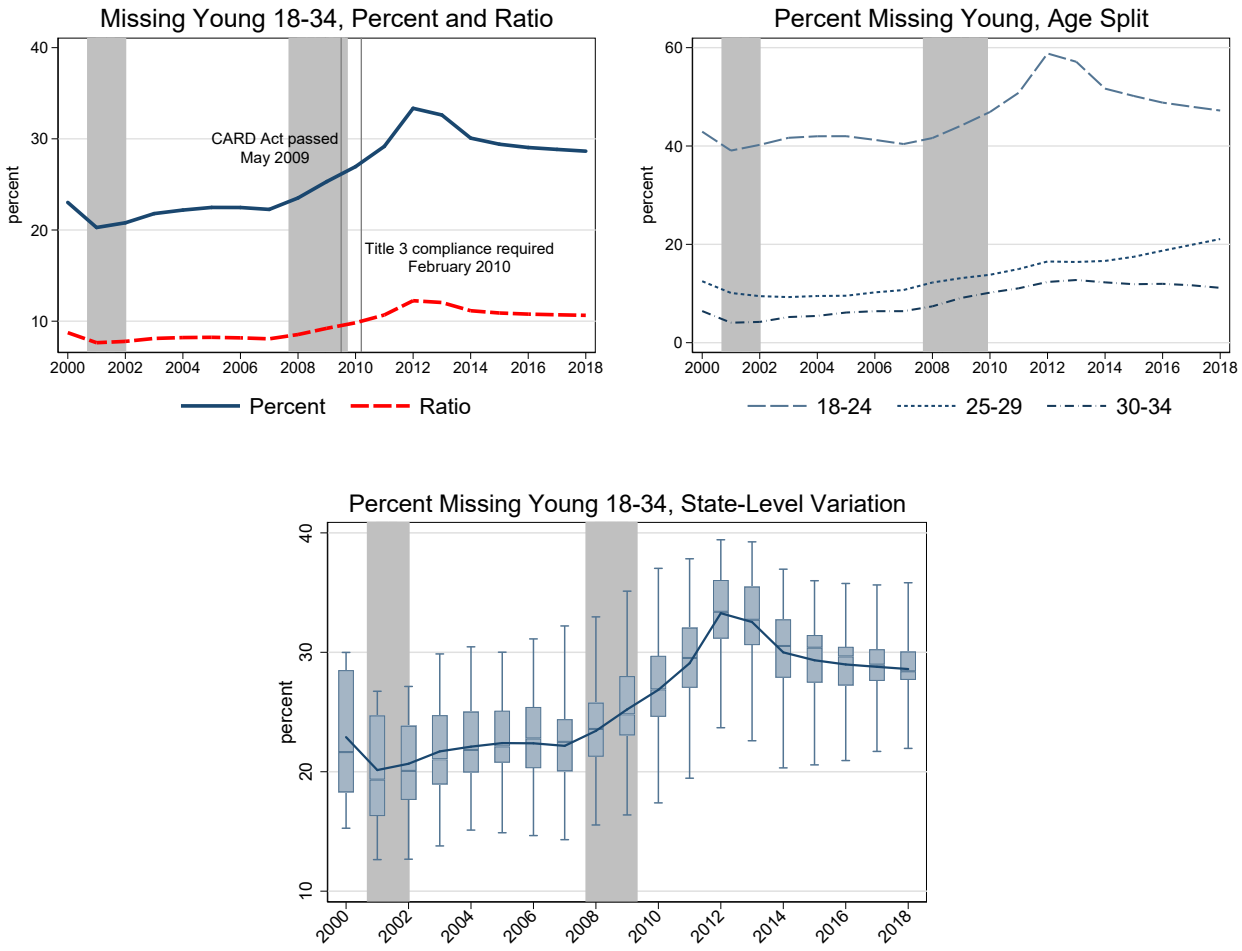
Schwandt, H. and T. von Wachter (2019). Unlucky Cohorts: Estimating the long-term effects of entering the labor market in a recession in large cross-sectional data sets. *Journal of Labor Economics 37*(1), S161–S198.

Speer, J. (2016). Wages, Hours, and the School-to-Work Transition: The Consequences of Leaving School in a Recession for Less-Educated Men. *The B.E. Journal of Economic Analysis & Policy 16*(1), 97–124.

Stoddard, C. and C. Urban (2019). The Effects of State-Mandated Financial Education on College Financing Behaviors. *Journal of Money, Credit and Banking*. Forthcoming.

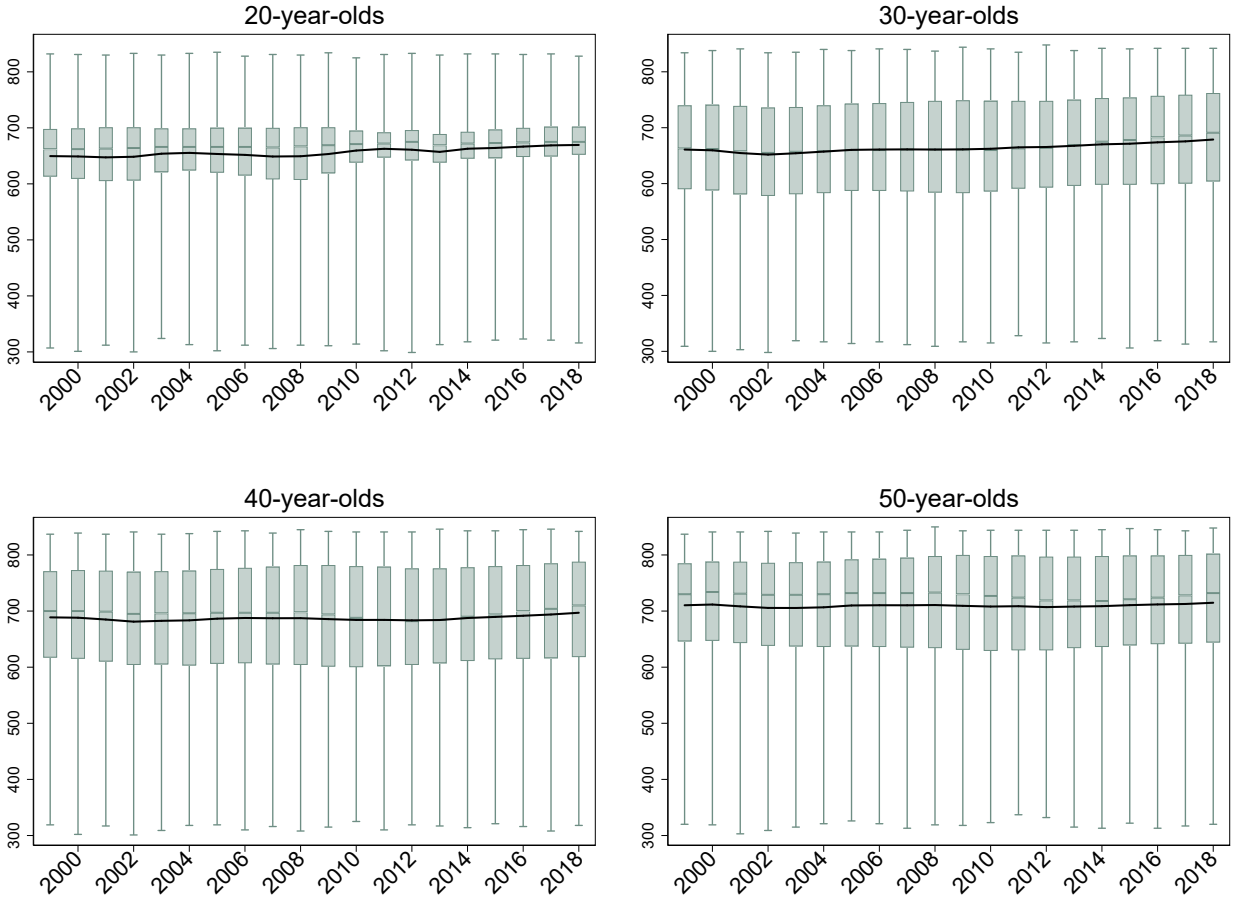
Urban, C. and M. Schmeiser (2015, October). State-Mandated Financial Education: A National Database of Graduation Requirements, 1970-2014. Insights: Financial Capability, FINRA Investor Education Foundation.

Figure 1. Missing Young Indicators



Source: Authors' calculations using the NY Fed CCP provided by Equifax and data from Census/Haver Analytics. *Notes:* The percent missing young measure (solid line, top-left panel) is a percent missing indicator based on population counts of young adults in both the census and the CCP (see text for more details). The ratio missing young measure (dashed red line in the top-left panel) is the percent missing young measure multiplied by the relative number of young adults ages 18 to 34 to the total number of adults ages 18 to 65 in a given state according to census population data. The bottom panel shows state-level variation in the percent missing young measure for 18- to 34-year-olds, the solid series in the top-left panel. The box and whiskers show the interquartile range, median, minimum, and maximum percent missing young across states, and the solid line depicts the (population-weighted) average across all states.

Figure 2. Distribution of Credit Scores by Age over Time



Source: Authors' calculations using the NY Fed CCP provided by Equifax.
Notes: The CCP contains a generic credit score (Equifax Risk Score) much like others available in the credit bureau marketplace. The box and whiskers show the interquartile range, median, minimum, and maximum. The line depicts the average. The figure highlights how the distribution of credit scores for individuals affected by the CARD Act (20-year-olds) has compressed.

Table 1. The Missing Young and Consumption Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	Percent Missing Young			Ratio Missing Young		
	Total	Nondurables + Services	Durables	Total	Nondurables + Services	Durables
Income Growth	0.16***	0.14***	0.28***	0.16***	0.14***	0.28***
	(0.03)	(0.02)	(0.05)	(0.03)	(0.02)	(0.05)
House-Price Growth	0.04***	0.01	0.20***	0.04***	0.01	0.20***
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.03)
Change in Unemployment	–0.26***	–0.18**	–0.85***	–0.25***	–0.17**	–0.84***
	(0.09)	(0.08)	(0.22)	(0.09)	(0.08)	(0.22)
Change in Confidence	0.00	–0.01	0.04*	0.00	–0.01	0.04*
	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.02)
Avg. Credit Score	0.05***	0.06***	–0.01	0.06***	0.07***	–0.01
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)
Missing Young, 18–34	–0.05**	–0.06**	0.01	–0.16**	–0.18***	–0.04
	(0.02)	(0.03)	(0.05)	(0.06)	(0.06)	(0.13)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.30	0.24	0.36	0.30	0.24	0.36
Observations	969	969	969	969	969	969

Notes: Regression: $\Delta \log(c_{it}) = \alpha_i + \mu_t + \beta_y \, \Delta \log(y_{it}) + \beta_h \, \Delta \log(h_{it}) + \beta_u \, \Delta u_{it} + \beta_{cf} \, \Delta \text{conf}_{rt} + \beta_{cs} \, \text{cs}_{it} + \beta_{my} \, \text{my}_{it} + \varepsilon_{it}$. i, t, and r denote a state, a year, and a census region, respectively. α_i and μ_t denote state and time fixed effects. c and y are real consumption per capita and disposable income per capita, respectively, from the BEA, h is a house-price index from CoreLogic, u is the unemployment rate from the BLS, "conf" is consumer sentiment from the Conference Board, "cs" is the average credit score in the state (from Equifax), and "my" is a missing young measure computed by the authors. Percent Missing Young is the percentage of missing young calculated comparing counts of young adults in the census and the NY Fed CCP data provided by Equifax; Ratio Missing Young is Percent Missing Young multiplied by the share of young individuals relative to all individuals aged 18 to 65 in the census. All regressions are population weighted at the state level. Sample period: 2000–2018. Standard errors clustered by state in parenthesis. *** (**) [*] significant at the 1 (5) [10] percent level.

Table 2. Difference in Difference Regressions. 27-year-olds compared with 30-year-olds in 2006 vs. 2018

	(1) Age Oldest Acct	(2) 90-day Delinquency	(3) Has Mortgage	(4) Credit Score	(5) Mortgage Rate
Age=27	–21.71***	0.11	–10.31***	–10.30***	–0.01**
	(0.43)	(0.08)	(0.28)	(0.53)	(0.01)
Year=2018	1.26***	–0.24*	–11.20***	18.24***	–1.86***
	(0.40)	(0.12)	(0.50)	(1.10)	(0.02)
Year=2018 × Age=27	–7.66***	–0.42***	1.60***	0.14	0.04***
	(0.37)	(0.10)	(0.31)	(0.70)	(0.01)
Constant	105.03***	5.52***	33.52***	641.11***	7.48***
	(0.91)	(0.17)	(1.55)	(3.74)	(0.06)
R-squared	0.09	0.00	0.03	0.01	0.69
Observations	758295	758295	758295	758295	269732

Notes: Regression: $y = \alpha_s + \beta_a \text{Age}_{27} + \beta_y \text{Year}_{2018} + \beta_{ay}\ \text{Age}_{27} \times \text{Year}_{2018} + \varepsilon$. α_s denotes state fixed effects. Regressions use NY Fed CCP data provided by Equifax in columns (1) to (4). Credit score is the Equifax Risk Score. The data for column (5) come from Credit Risk Insight Servicing McDash (CRISM). Additional controls in column (5) include credit scores at loan origination, loan-to-value ratios, type and term of the loan, and whether PMI is required. Only individuals ages 27 and 30 are included in the regressions, and the data compares 2006 to 2018. Standard errors clustered by state are in parenthesis. *** (**) [*] significant at the 1 (5) [10] percent level.

Table 3. The Missing Young, Poverty, and Financial Education

	(1)	(2)	(3)	(4)	(5)	(6)
	Percent Missing Young 18 to 34			Ratio Missing Young 18 to 34		
Poverty rate	0.06		–0.02	0.01		–0.01
	(0.50)		(–0.14)	(0.35)		(–0.26)
Year≥2010 × Poverty rate	0.18*		0.21*	0.06*		0.08
	(1.90)		(1.83)	(1.76)		(1.66)
Financial education req.		0.30	0.12		0.13	0.07
		(0.64)	(0.24)		(0.71)	(0.34)
Year≥2010 × Financial educ. req.		–0.70***	–0.64***		–0.27***	–0.25***
		(–4.69)	(–4.28)		(–3.54)	(–3.26)
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Within Adj. R sq.	0.03	0.06	0.09	0.03	0.06	0.09
Observations	969	969	969	969	969	969

Notes: State-level regressions using census data (poverty rate), NY Fed CCP data provided by Equifax (missing young), and data from Urban and Schmeiser (2015) (financial education). The financial education requirement measure represents the share of individuals 18 to 34 years old in a given state each year who were potentially exposed to personal finance education in high school due to state-mandated graduation requirements in place when those individuals were 15 years old as collected by Urban and Schmeiser (2015). This variable has been standardized for easier interpretation. Standard errors, in parenthesis, clustered by state. *** (**) [*] significant at the 1 (5) [10] percent level.

Table 4. Percent Missing Young and Total Consumption Growth. IV Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	Reduced-Form IV	IV	OLS	Reduced-Form IV	IV
Income Growth	0.16***	0.17***	0.15***	0.16***	0.16***	0.12***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
House-Price Growth	0.04***	0.03***	0.04***	0.04***	0.03***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Change in Unemployment	–0.26***	–0.29***	–0.24**	–0.26***	–0.28***	–0.19*
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.11)
Change in Confidence	0.00	–0.00	0.00	0.00	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Avg. Credit Score	0.05***	0.05***	0.06***	0.06***	0.05***	0.09***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Missing Young, 18–34	–0.05**	–0.03***	–0.12***			
	(0.02)	(0.01)	(0.03)			
Missing Young, 18–24				0.01		
				(0.03)		
Missing Young, 25–29				–0.04***	–0.03***	–0.15***
				(0.01)	(0.01)	(0.05)
Missing Young, 30–34				–0.02		
				(0.02)		
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
F excl. instrument			26.98			9.19
R-squared	0.28	0.28	0.26	0.29	0.28	0.15
Observations	969	969	969	969	969	969

Notes: Regression: $\Delta \log(c_{it}) = \alpha_i + \mu_t + \beta_y \, \Delta \log(y_{it}) + \beta_h \, \Delta \log(h_{it}) + \beta_u \, \Delta u_{it} + \beta_{cf} \, \Delta \text{conf}_{rt} + \beta_{cs} \, \text{cs}_{it} + \beta_{my} \, \text{my}_{it} + \varepsilon_{it}$. i, t, and r denote a state, a year, and a census region, respectively. α_i and μ_t denote state and time fixed effects. c and y are real consumption per capita and disposable income per capita, respectively, from the BEA, h is a house-price index from CoreLogic, u is the unemployment rate from the BLS, "conf" is consumer sentiment from the Conference Board, "cs" is the average credit score in the state (Equifax Risk Score), and "my" is the missing young measure computed by the authors comparing NY Fed CCP data provided by Equifax and census population data. (Percent) Missing Young is the percentage of missing young calculated comparing counts of young adults in the CCP and the census, defined for the specific age group indicated in the table's rows. The instrument is based on the fraction of young individuals in a given state potentially affected by the CARD Act, combined with the degree of financial education and the share of parents unlikely to be able to co-sign loans in that state as described in Section 3. All regressions are population weighted at state level. Sample period: 2000–2018. Standard errors clustered by state in parenthesis. *** (**) [*] significant at the 1 (5) [10] percent level.

Table 5. Percent Missing Young and Total Consumption Growth. IV Regressions. Robustness

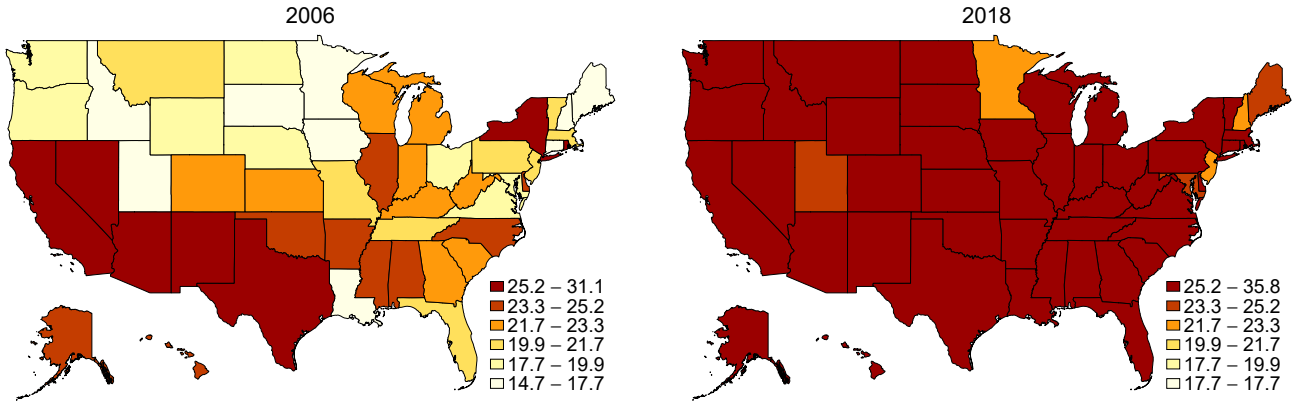
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Missing Young, 18–34				Missing Young, 25–29			
Income Growth	0.15***	0.16***	0.15***	0.15***	0.12***	0.11***	0.12***	0.12***
	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)	(0.03)	(0.03)
House-Price Growth	0.05***	0.05***	0.04***	0.04***	0.07***	0.09***	0.06***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Change in Unemployment	–0.23**	–0.24**	–0.20*	–0.26***	–0.18	–0.14	–0.17	–0.18
	(0.09)	(0.09)	(0.10)	(0.08)	(0.11)	(0.15)	(0.12)	(0.11)
Change in Confidence	–0.00	–0.00	0.00	–0.00	0.00	0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Avg. Credit Score			0.07***	0.07***			0.09***	0.10***
			(0.01)	(0.01)			(0.02)	(0.02)
Missing Young	–0.12***	–0.11**	–0.13***	–0.13**	–0.17***	–0.22*	–0.15***	–0.17***
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.11)	(0.05)	(0.06)
Subprime Parent	–0.10***	–0.10***			–0.17***	–0.19***		
	(0.03)	(0.03)			(0.04)	(0.06)		
No Finc. Edu		–0.00				0.00		
		(0.00)				(0.01)		
Young Unemployment Experience			0.13				0.05	
			(0.09)				(0.09)	
Pop 18–34× Year=2000–06				–0.11				–0.14
				(0.12)				(0.09)
Pop 18–34× Year=2007–09				–0.21				–0.34***
				(0.13)				(0.09)
Pop 18–34× Year=2010–18				–0.23**				–0.25**
				(0.11)				(0.10)
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F excl. instrument	28.13	30.02	30.89	14.91	9.94	2.94	9.72	9.64
R-squared	0.23	0.24	0.26	0.16	0.06	–0.14	0.15	0.13
Observations	969	969	969	969	969	969	969	969

Notes: Regression: $\Delta \log(c_{it}) = \alpha_i + \mu_t + \beta_y \, \Delta \log(y_{it}) + \beta_h \, \Delta \log(h_{it}) + \beta_u \, \Delta u_{it} + \beta_{cf} \, \Delta \text{conf}_{rt} + \beta_{cs} \, \text{cs}_{it} + \beta_{my} \, \text{my}_{it} + \varepsilon_{it}$. i, t, and r denote a state, a year, and a census region, respectively. α_i and μ_t denote state and time fixed effects. c and y are real consumption per capita and disposable income per capita, respectively, from the BEA, h is a house-price index from CoreLogic, u is the unemployment rate from the BLS, "conf" is consumer sentiment from the Conference Board, "cs" is the average credit score in the state (Equifax Risk Score), and "my" is the missing young measure computed by the authors comparing NY Fed CCP data provided by Equifax and census population data. (Percent) Missing Young is the percentage of missing young calculated comparing counts of young adults in the CCP and the census, defined for the specific age group indicated in the table's rows. The instrument is based on the fraction of young individuals in a given state potentially affected by the CARD Act, combined with the degree of financial education and the share of parents unlikely to be able to co-sign loans in that state as described in Section 3. All regressions are population weighted at state level. Sample period: 2000–2018. Standard errors clustered by state in parenthesis. *** (**) [*] significant at the 1 (5) [10] percent level.

A ONLINE APPENDIX

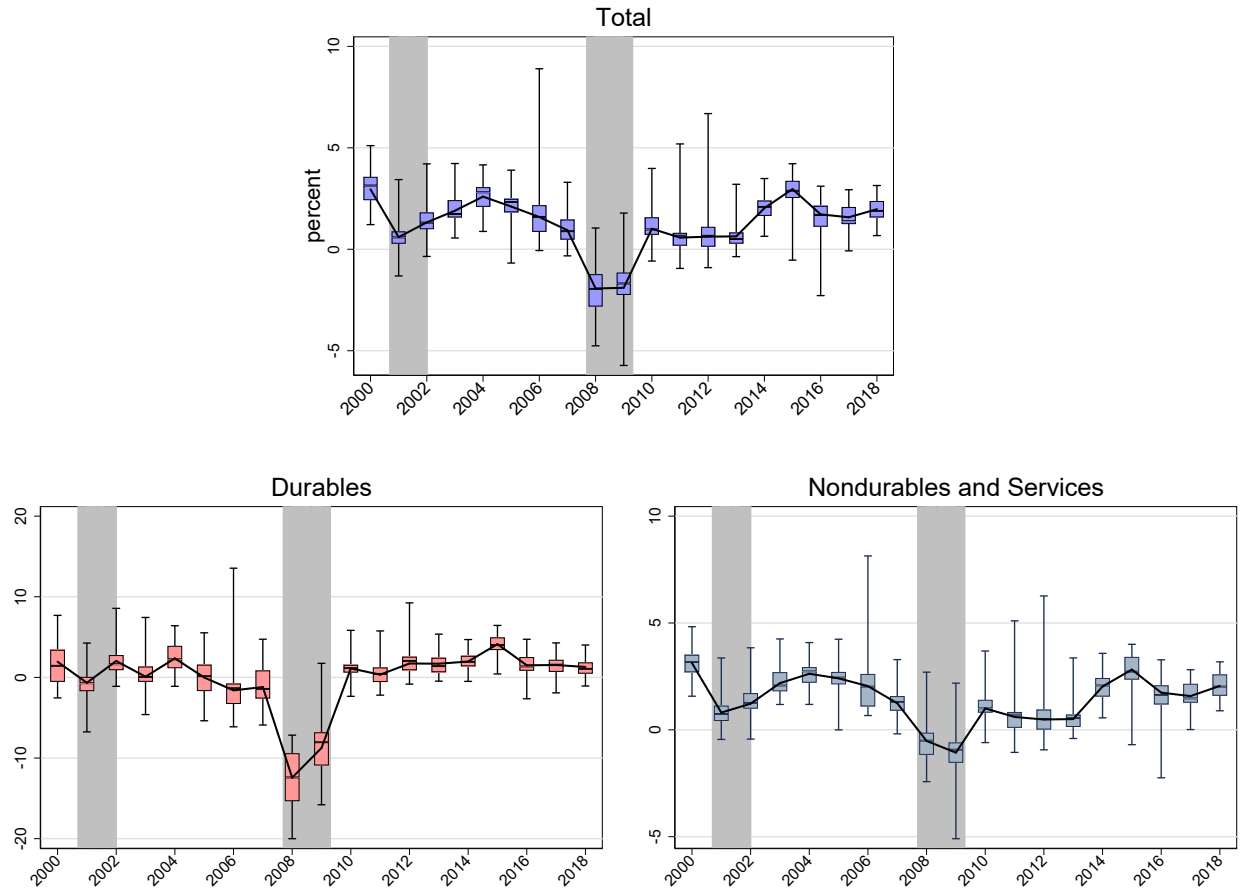
A.1 Additional figures and tables

Figure A.1. Percent Missing Young, Aged 18 to 34: State-Level Variation



Source: Authors' calculations using the NY Fed CCP data provided by Equifax and Census Bureau data.
Notes: Percent Missing Young is based on population counts of young adults in both the census and the CCP (CCP data are multiplied by 20 since the CPP is a 5 percent sample of US population).

Figure A.2. State-Level Variation in Consumption Growth



Source: Authors' calculations using BEA data.
Notes: The box and whiskers show the interquartile range, median, minimum, and maximum growth in the plotted series across states. The line depicts the (population-weighted) average across states.

Table A.1. Summary Statistics for Regressions

Variable	Mean	Std. Dev.	Min.	Max.	N
Consumption Growth	1.22	1.5	-5.73	8.9	969
Income Growth	1.35	1.98	-6.66	11.99	969
House-Price Growth	3.42	6.18	-25.69	27.27	969
Change in Unemployment	-0.03	1.13	-2.7	5.57	969
Change in Confidence	0.07	13.66	-46.22	28.65	969
Avg. Credit Score	676.49	18.75	619.31	716.31	969
Percent Missing Young, 18–34	25.97	5.16	12.64	39.42	969
Percent Missing Young, 18–24	46.15	6.72	28.14	72.23	969
Percent Missing Young, 25–29	13.74	6.14	-12.71	30.36	969
Percent Missing Young, 30–34	8.77	4.39	-5.59	19.14	969
Ratio 18-34/18-65, Census	36.91	2.04	30.37	48.85	969
Ratio Missing Young, 18–34	9.62	2.11	4.43	19.24	969
Ratio Missing Young, 18–24	7.16	1.18	4.23	12.94	969
Ratio Missing Young, 25–29	1.51	0.74	-1.19	5.10	969
Ratio Missing Young, 30–34	0.94	0.49	-0.56	2.49	969
Poverty Rate	13.2	2.95	4.5	25.8	969
Exposed to financial educ.	14.55	28.8	0	100	969
Subprime share, 50+	30.97	6.32	17.83	48.22	969

Source: Census/Haver Analytics, Bureau of Economic Analysis, CoreLogic, and the NY Fed CCP provided by Equifax.

Notes: Statistics weighted by state population. There are a few negative observations of the missing young variables for the older age groups. These observations correspond to small states in the early years of the sample, which may be due to oversampling in the CCP data. Our results are robust to setting these observations to zero or excluding them altogether. Sample period: 2000–2018.

Table A.2. Correlation Matrix

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	Consumption Growth	1.00												
(2)	Income Growth	0.54	1.00											
(3)	House-Price Growth	0.65	0.30	1.00										
(4)	Change in Unemployment	-0.55	-0.31	-0.42	1.00									
(5)	Change in Confidence	0.28	0.21	0.10	-0.16	1.00								
(6)	Avg. Credit Score	0.07	0.05	-0.00	-0.10	0.07	1.00							
(7)	Percent Missing Young, 18–34	-0.10	-0.08	-0.12	-0.28	0.24	0.01	1.00						
(8)	Percent Missing Young, 25–29	-0.12	-0.05	-0.06	-0.16	0.17	0.01	0.83	1.00					
(9)	Ratio Missing Young, 18–34	-0.08	-0.06	-0.08	-0.26	0.22	-0.02	0.95	0.81	1.00				
(10)	Ratio Missing Young, 25–29	-0.11	-0.04	-0.04	-0.15	0.17	0.01	0.82	0.98	0.84	1.00			
(11)	Poverty Rate	-0.16	-0.08	-0.19	-0.03	0.09	-0.62	0.45	0.30	0.46	0.31	1.00		
(12)	Subprime Share, 50+	-0.13	-0.09	-0.07	0.04	-0.01	-0.96	0.18	0.13	0.19	0.13	0.70	1.00	
(13)	Exposed to financial educ.	0.03	0.01	-0.02	-0.10	0.09	0.15	0.14	0.16	0.11	0.16	-0.03	-0.10	1.00

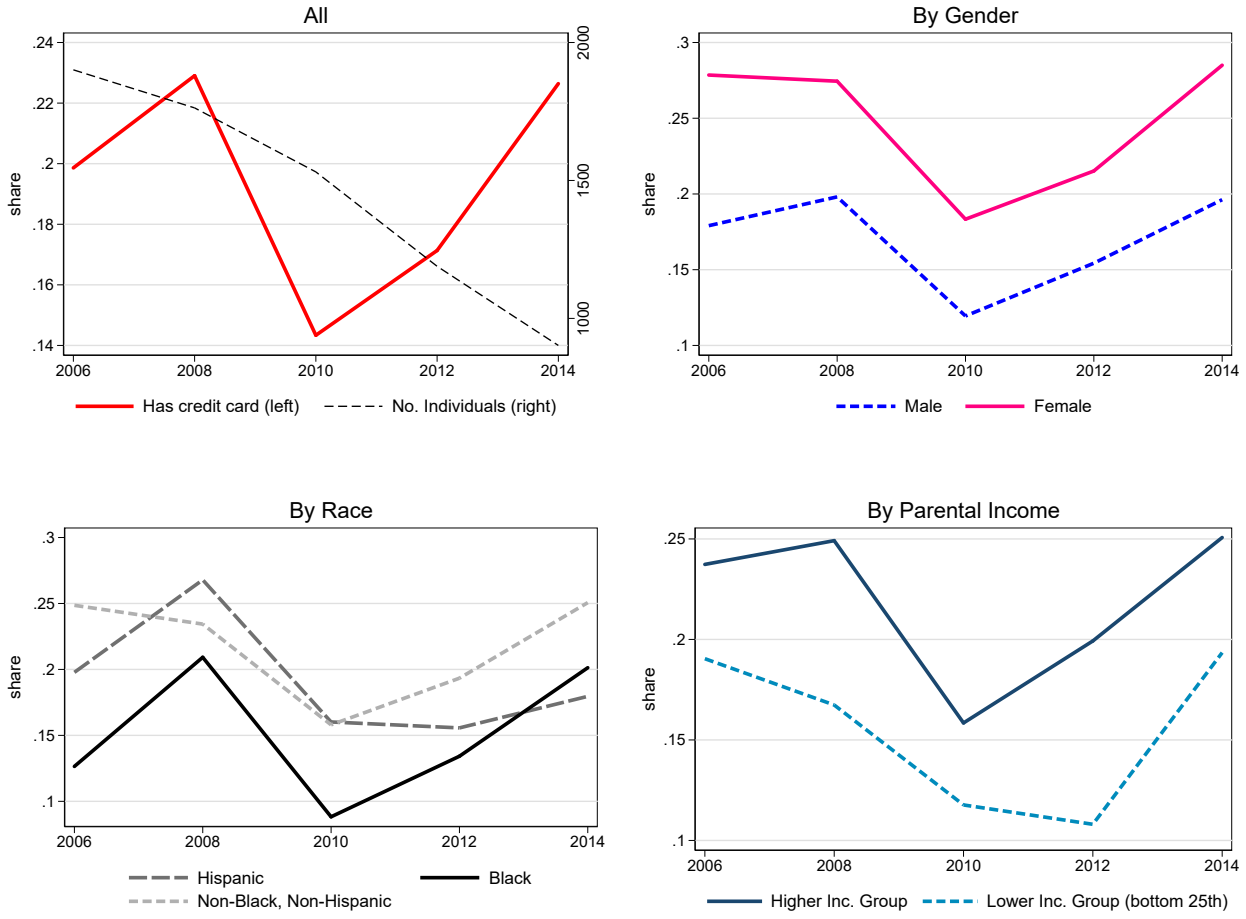
Source: Census/Haver Analytics, Bureau of Economic Analysis, CoreLogic, and the NY Fed CCP provided by Equifax. Sample period: 2000–2018.

A.2 Socioeconomic background matters: Evidence from the NLSY79

We document a decline in the share of young adults with credit cards and an uneven recovery across socioeconomic groups, using data on a sample of individuals whose mothers are members of the National Longitudinal Survey of Youth of 1979 (NLSY79). While these young adults are not necessarily representative of the US population (unlike their mothers), the data allow us to track access to credit cards and, more importantly, look at socioeconomic differences among individuals likely affected by the CARD Act as credit bureau data have no demographic information other than age. The NLSY79 children are interviewed biennially, and the most recent data available are for 2014. We focus on persons who are 18 to 21 years old at the time of each interview. The number of individuals in the data in this age range declines over time as their mothers get older, see the top-left panel of Figure A.3, so these results should be interpreted with caution.

We document a decline in the share of young adults with credit cards immediately after the act took effect in all socioeconomic groups. Some reversal of this trend begins in 2012, and having a credit card in 2014 depends on the race as well as the socioeconomic status of youngsters' parents. Non-black, non-Hispanic young individuals, those from more affluent families, and females were more likely to have a credit card in 2014 than were other groups of 18- to 21-year-olds. Also, the recovery in the share of children with credit cards was slower for non-white (especially Hispanic) young adults and those with lower-income parents. The partial reversal that starts in 2012 could be due to young individuals and their parents learning over time how to obtain credit cards under the new regulation, as well as to the economic recovery. Some of the relationship between parental income and young adults' credit card access later on may be due to lower-income parents being less able to co-sign for their child's credit card. Overall, these patterns are consistent with credit availability being more limited in the years since the enactment of the CARD Act for younger individuals who may be fairly or unfairly perceived as riskier borrowers.

Figure A.3. Share of Young Adults 18 to 21 with Credit Cards: NLSY79 Children



Source: Authors' calculations using data on children of women belonging to the National Longitudinal Survey of Youth 1979 cohort (NLSY79).
Notes: The data are biennial, and 2014 is the latest year available. This sample of young adults, unlike their mothers, is not necessarily representative of the US population. The figure shows a decline in the share of 18- to 21-year-olds with credit cards after the CARD Act passed, with partial reversal starting in 2012. The recovery was slower for young adults with lower-income parents and Hispanics.

A.3 Robustness tests

Table A.3 illustrates that our main results are stable across multiple specifications, and confirms that consumption growth falls as the share of MY increases. This result is driven primarily by individuals aged 25 to 29, which is not surprising since 30- to 34-year-olds were untreated by the CARD Act, and 18- to 24-year-olds may be too young to need or want credit.

All regressions reported in this appendix use the percent MY measure that compares census population counts of young individuals to counts from the NY Fed CCP (results are similar for the ratio MY). Panel A presents results when the young group is comprised of individuals ages 18 to 34, while panel B focuses on results that focus on individuals ages 25 to 29. Column (1) reproduces OLS results for easy reference, columns (2)–(7) present results from reduced-form IV estimates, and columns (8)–(12) present IV results. We consider different variations of the instrument as follows.

Treat1 is the number of young adults potentially affected (PA) by the CARD Act to begin with. Specifically, Treat1= PA_{it}^{a}, where a is an age group, either 18 to 34 or 25 to 29. In panel A, that reports results for 18- to 34-year-olds, PA_{it}^{18-34} is zero before 2010. In 2010, PA_{it}^{18-34} is the number of 18- to 20-year-olds in state i relative to the number of 18- to 34-year-olds in that state and year. In 2011, PA_{it}^{18-34} is the number of 18- to 21-year-olds relative to the number of 18- to 34-year-olds, and similarly for other years adding one additional age group to the numerator each year. Analogously, in panel B, Treat1= $\text{PA}_{it}^{25-29} = 0$ before 2015, when no 25- to 29-year-olds were affected by the act. In 2015, PA_{it}^{25-29} is the number of 25-year-olds relative to the number of 25- to 29-year-olds in state i that year. In 2016 PA_{it}^{25-29} is the number of 25- and 26-year-olds relative to the number of 25- to 29-year-olds, and so on.

There is little variation in Treat1 within states over time after including state and time fixed effects in our specifications. Therefore, it is not surprising that Treat1 has low explanatory power (column [2]), especially for the 25-to-29 MY group. Moreover, not all individuals affected by the act will be "treated," as some of them will be able to obtain credit cards if they can pass income requirements or can find willing co-signers. We take this observation into account when constructing Treat2. Treat2 = $\text{PA}_{it} \times \text{SP}_{i,2009}$, where $\text{SP}_{i,2009}$ is the fraction of subprime individuals 50+ (potential parents) in state i in 2009. We choose 2009, pre-CARD Act, as our measure of subprime parents to begin with, but using other years yields similar results. Treat2 is still a weak instrument (see columns [3] and [8]). Note, however, that while the sign and the magnitude of the impact of the MY on consumption

growth in reduced-form regressions is a bit lower than the OLS coefficient, the magnitude of the estimate coefficient rises significantly in IV regressions. The reason is that the IV estimate picks up the fact that only a portion of measured MY is actually treated (26 percent in our sample).

Treat4 allows for the share of subprime parents to vary over time, SP_{it}, to account for the fact that local economic prospects change and also affect potential co-signers. Results using this instrument, columns (5) and (10), are again similar to those using Treat2, but the instrument is stronger. One concern with this instrument is that it may fail the instrument exogeneity assumption. However, we control for state level average credit scores, state and time fixed effects, thus removing much of the state specific components correlated with the subprime share. Directly controlling for subprime share in the regressions is problematic because it is highly collinear with average credit scores. If we remove average credit scores and include the subprime share instead, our results are very similar. So conditional on our controls, and given that our estimated coefficients are all very stable across specifications, it is likely that Treat4 satisfies the necessary exogeneity assumptions.

As mentioned in the text, financial education has an important impact on the share of MY—states with a higher share of students exposed to a personal finance curriculum had lower rates of MY after the CARD Act was introduced. We take this into account and generate the share of state population *not* exposed to financial education in high school (NoF_{it}). We construct our next set of instruments, Treat3=$PA_{it} \times SP_{i,2009} \times NoF_{it}$, Treat5=$PA_{it} \times SP_{it} \times NoF_{it}$, and Treat6=$PA_{it} \times Poverty_{it} \times NoF_{it}$ (controlling for poverty directly does not affect any results). Using these alternative instruments, we obtain similar results to those using Treat2 or Treat4. Treat5 is the strongest instrument, and the one we used in the main text. We also experimented with excluding subprime or poverty measures from the instrument on the grounds that these measures are potentially endogenous, but found that our estimates were insensitive to these exclusions, and the instruments became weaker.

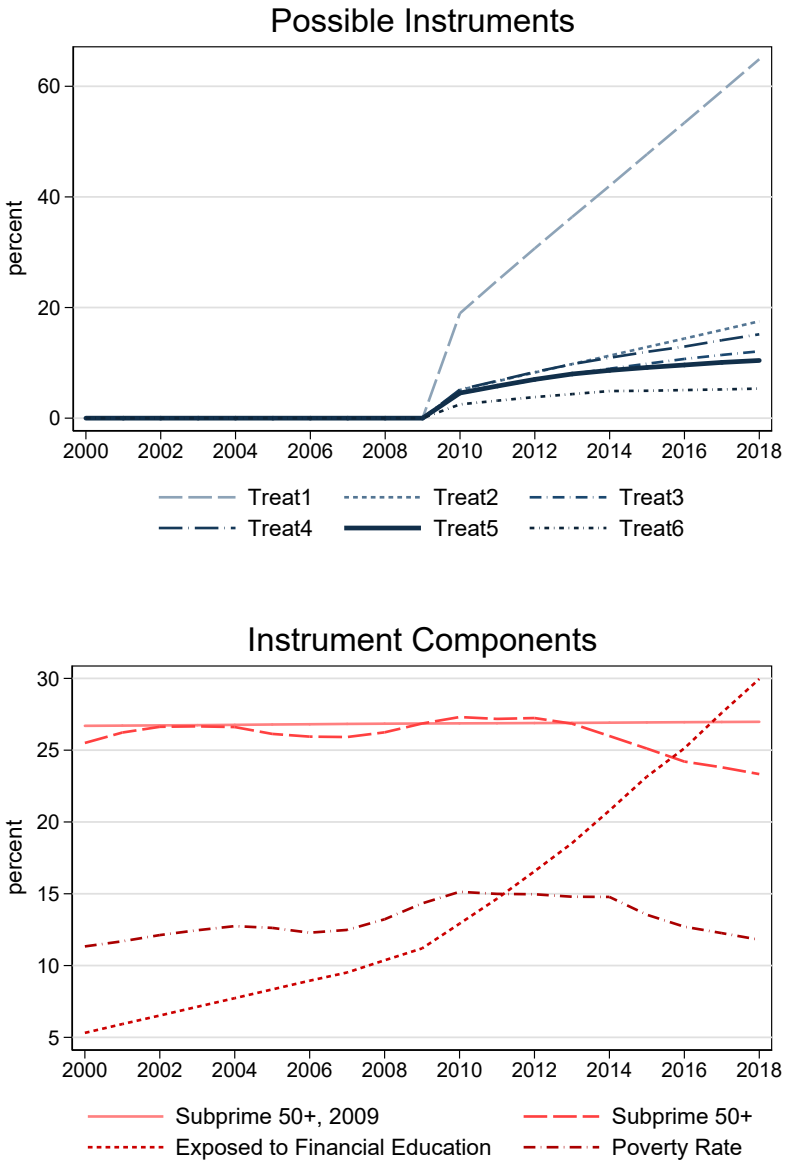
To summarize, we find that our results are robust to a large set of instruments and controls, lending credence to our claim that the CARD Act had a lasting impact on consumption growth at the state level, by reducing credit access for young adults, especially those ages 25 to 29.

Table A.3. Percent Missing Young and Total Consumption Growth. IV-Regressions. Robustness

	(1) OLS	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Reduced Form IV						IV				
		Treat1	Treat2	Treat3	Treat4	Treat5	Treat6	Treat2	Treat3	Treat4	Treat5	Treat6
Panel A: Missing Young 18-34												
Income Growth	0.16***	0.17***	0.17***	0.17***	0.17***	0.17***	0.17***	0.15***	0.15***	0.15***	0.15***	0.16***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
House-Price Growth	0.04***	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***	0.04***	0.04***	0.04***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Change in Unemployment	–0.26***	–0.28***	–0.29***	–0.29***	–0.28***	–0.29***	–0.28***	–0.23**	–0.23**	–0.24**	–0.24**	–0.25***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)	(0.09)	(0.10)	(0.09)	(0.09)
Change in Confidence	0.00	–0.00	0.00	–0.00	0.00	–0.00	–0.00	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Avg. Credit Score	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.06***	0.06***	0.06***	0.06***	0.06***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Missing Young, 18–34	–0.05**	–0.03	–0.03	–0.03**	–0.04**	–0.03***	–0.03	–0.13	–0.13***	–0.12**	–0.12***	–0.09*
	(0.02)	(0.03)	(0.02)	(0.01)	(0.02)	(0.01)	(0.03)	(0.08)	(0.04)	(0.06)	(0.03)	(0.05)
F excl. inst.								3.66	8.00	7.01	26.98	6.30
R-squared	0.28	0.27	0.27	0.28	0.28	0.28	0.27	0.25	0.25	0.26	0.26	0.28
Observations	969	969	969	969	969	969	969	969	969	969	969	969
Panel B: Missing Young 25-29												
Income Growth	0.16***	0.17***	0.17***	0.17***	0.17***	0.16***	0.17***	0.12***	0.11***	0.13***	0.12***	0.14***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
House-Price Growth	0.04***	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***	0.06***	0.07***	0.05***	0.06***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Change in Unemployment	–0.26***	–0.28***	–0.29***	–0.28***	–0.28***	–0.28***	–0.28***	–0.19	–0.17	–0.21*	–0.19*	–0.21**
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.12)	(0.12)	(0.10)	(0.11)	(0.10)
Change in Confidence	0.00	–0.00	0.00	–0.00	0.00	0.00	–0.00	0.01	0.01	0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Avg. Credit Score	0.06***	0.05***	0.05***	0.05***	0.05***	0.05***	0.05***	0.09***	0.10***	0.08***	0.09***	0.08***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.01)	(0.02)	(0.01)
Missing Young, 25–29	–0.04***	–0.00	–0.04**	–0.03**	–0.06***	–0.03***	–0.04*	–0.15	–0.18**	–0.12**	–0.15***	–0.11***
	(0.01)	(0.07)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.11)	(0.08)	(0.05)	(0.05)	(0.04)
F excl. inst.								2.36	2.87	5.41	9.19	4.15
R-squared	0.29	0.27	0.28	0.28	0.28	0.28	0.28	0.15	0.06	0.22	0.15	0.24
Observations	969	969	969	969	969	969	969	969	969	969	969	969

Notes: See notes to Table 4 for regression specifications. Treat1: potentially treated based on age only. Treat2: Treat1 × fraction of subprime individuals 50+ in 2009. Treat3: Treat2 × fraction of individuals not exposed to financial education. Treat4: Treat1 × fraction of subprime individuals 50+, varying by year. Treat5: Treat4 × fraction of individuals not exposed to financial education (instrument used in Table 4 in the main text). Treat6: Treat1 × poverty rate × fraction of individuals not exposed to financial education. All regressions include state and year fixed effects. Standard errors clustered by state in parenthesis. *** (**) [*] significant at the 1 (5) [10] percent level.

Figure A.4. Instrument Visualization
Percent Missing Young 18–34



Source: Authors' calculations using the NY Fed CCP data provided by Equifax, Census Bureau data, and data on state-mandated graduation requirements in place when individuals were 15 years old as collected in Urban and Schmeiser (2015).
Notes: The instruments tried for robustness in Table A.3 are depicted in the top panel of the figure. Treat1: potentially treated based on age only. Treat2: Treat1 × fraction of subprime individuals 50+ in 2009. Treat3: Treat2 × fraction of individuals not exposed to financial education. Treat4: Treat1 × fraction of subprime individuals 50+, varying by year. Treat5: Treat4 × fraction of individuals not exposed to financial education (instrument used in Table 4 in the main text). Treat6: Treat1 × poverty rate × fraction of individuals not exposed to financial education. The bottom panel of the figure depicts the components used in the construction of these instruments.

Table A.4. Demand for Credit of the Young, Survey of Consumer Finances

	(1)	(2)	(3)	(4)
	2004 vs. 2013		2004 vs. 2016	
	Has Credit Card	Applied for Credit	Has Credit Card	Applied for Credit
Young	0.07	0.00	–0.06	–0.01
	(0.15)	(0.21)	(0.17)	(0.23)
Post†	–0.13***	–0.05	0.00	–0.17*
	(0.04)	(0.04)	(0.08)	(0.09)
Yong × Post	–0.11	–0.13	–0.04	0.13**
	(0.09)	(0.09)	(0.05)	(0.05)
Age FE	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes
R-squared	0.30	0.15	0.26	0.11
Observations	600	600	1365	1365

Source: Authors' calculations using Survey of Consumer Finances data.

Notes: For the 2004 vs. 2013 model, we compare individuals 18 to 21 years old (*young*, who were treated by the act) in the survey to individuals 24 to 27 years old (never treated); and for the 2004 vs. 2016 model, we compare individuals 18 to 24 years old (*young*) to those 27 to 33 years old (never treated). *Post* is a dummy variable equal to one if the year is post-CARD Act. (†) Importantly, the wording of the question regarding credit applications changed in 2016 the survey. Prior to 2016 the question asks about applying for credit in the last 5 years, but in 2016 it only asks about applications in the last 12 months. Thus, the 2016 data are not directly comparable to the 2004 data, since the incidence of applications for credit over the last 12 months is lower than over the last 5 years. (The analysis comparing 2013 to 2004 is not affected by this wording change.) The *Post* dummy in the 2016 model partially picks up the wording change in the credit application question, and thus the coefficient is negative. All regressions are weighted using survey weights and include age fixed effects, along with controls for race, ethnicity, gender, education, financial literacy, number of kids, marital status, labor force participation status, the log of real family income, and controls for expectations about future economic conditions. Results without weights or with fewer controls are similar. Robust standard errors in parenthesis. *** (**) [*] significant at the 1 (5) [10] percent level.

Table A.5. Credit Card Limits and Income of the Young

	(1)	(2)	(3)	(4)	(5)	(6)
	Mean			Median		
	Credit Card Limit	Wage Income	Ratio	Credit Card Limit	Wage Income	Ratio
Panel A: 2006						
18-24	3,955	10,295	0.38	1,717	5,000	0.34
25-29	10,164	25,031	0.41	5,343	21,000	0.25
30-34	15,912	31,286	0.51	8,825	25,000	0.35
Panel B: 2018						
18-24	3,845	13,523	0.28	1,677	5,800	0.29
25-29	9,975	33,835	0.29	5,200	28,000	0.19
30-34	15,446	41,612	0.37	8,900	33,000	0.27

Source: Authors' calculations using the NY Fed CCP data provided by Equifax, and IPUMS-CPS data provided by the University of Minnesota, www.ipums.org (Flood et al. 2020).
Notes: Ratio is computed as the credit card limit divided by income.