

Effects of Entering the Credit Market in a Recession*

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Abstract

This paper studies the relationship between economic conditions and entry into the credit market using unique tradeline-level data that precisely identify the timing, product type, and age of entry into the credit market. We show that economic conditions are related to both the timing of entry and the type of product consumers enter the credit system with. Instrumental variables analysis shows that a one percentage point increase in the unemployment rate leads to a 2.7 point average increase in credit score two years after entry. This effect persists for up to 10 years after entry and remains economically meaningful. Higher unemployment at the time of entry also increases the likelihood of having a student loan and decreases access to auto loans and revolving credit for at least 10 years after entry.

*The views in this paper do not represent those of the Consumer Financial Protection Bureau or the United States.

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1 Introduction

Each year a significant share of the adult population enters the credit market by opening an initial credit account. Demand for first time credit is particularly high among young adults who must take out loans to attend college or purchase a first automobile. This initial demand for credit arises regardless of the state of the economy, leading some young adults to enter the credit market in bad economies where credit is tight and others to enter in good economies where credit access is relatively more relaxed. As a result, young adults who enter the credit market during a recession may have very different credit profiles later in life compared to similar individuals who entered just before or just after a recession. Understanding the relationship between the timing of entry into the credit market and the business cycle is important for understanding differences in access to credit and household balance sheets over time.

In this paper, we show that entry into the credit market is tightly linked to the business cycle. Bad economic conditions lead to less entry overall, and we show evidence that the composition of entrants and the entry product also changes. Consumers are relatively more likely to have student loans if they entered the credit market during higher periods of unemployment. Bad economic conditions also make consumers less likely to have auto loans and have relatively less open-end credit to draw upon within the first few years after entering the credit market. These credit effects are reflected in a consumer's credit score: consumers who enter in relatively higher unemployment periods experience immediate increases in scores that persist up to 10 years after entry. Our results underscore how the timing of credit entry affects an individual's credit access and use of credit over time, particularly for younger entrants.

We use detailed tradeline-level data from a sample of consumer credit reports starting in 2001 that precisely identify the timing and age of entry into the credit market for each consumer, as well as the initial product type and terms. In contrast, existing studies using credit panel data often use data aggregated by credit type that does not identify specific

lines of credit within each type, making it difficult to identify when and how consumers first acquire credit. The panel nature of our data also allows us to observe both the consumer's credit profile at entry and how a consumer's credit profile evolves over time.

Entry into the credit market is an important area of study given that no one is born with a credit record, but roughly 89 percent of US adults have credit records (Brevoort et al., 2015). Once a consumer enters the credit system, they rarely leave except upon death. Furthermore, credit scores—the primary measure of consumer credit risk—are a major component in determining future credit access as well as playing a role in non-credit decisions like employment and rental housing. Credit scores are based on the consumer's credit history. Thus, future access to credit along with other major financial priorities may be affected by the decisions a consumer makes and the credit they are able to obtain at the time of entry into the credit market.

At the same time, the timing of credit entry matters because the supply of credit varies based on economic conditions. For example, after the 2007–2009 recession relatively less revolving credit and mortgage credit was available to borrowers as bank lending standards became much stricter compared to the period prior to the economic downturn (Brown et al., 2013; Santucci, 2015; Goodman, 2017). Consumers looking to access credit during bad economic times may receive very different offers compared to borrowers searching for credit during good economic times. To the extent that these differences exist, the initial credit product and credit trajectory of otherwise similar borrowers may differ depending on whether they entered the credit market during a bad economy versus a good economy. However, the direction of these relationships is unclear from a theoretical perspective: while credit is generally more accessible during good economic times, the types of credit offered during better economic times may or may not be beneficial for consumers' long term credit profiles.

We begin our empirical analysis by examining the impact of economic conditions on entry into the credit market. Time-series trends imply a negative relationship between recessionary periods and the number of new credit market entrants. We summarize these findings using

a hazard model of entry, using contemporaneous county-level unemployment as a proxy for the economic environment. We find that the probability of entry falls by 1.8 percent for each additional percentage point increase in county-level unemployment.¹ This point estimate captures the overall change in entry net of changes in the supply of and demand for credit. Overall, the data point to a positive relationship between better economic conditions and entry.

We also find that economic conditions not only effect when, but how consumers enter the credit market. Conditional on having entered the credit market, clear differences arise in the patterns of take up by entry product. Borrowers are more likely to enter with a student loan and less likely to enter with almost any other credit product during periods of higher unemployment both in the raw data and after controlling for observables. Among those that enter, both the unemployment rate at 18 and the unemployment rate at entry are important predictors of entering the credit market with a student loan. Overall, our analysis points to a causal relationship between economic conditions and the way in which consumers enter the credit market.

Next, we exploit the panel nature of our data in order to analyze how economic conditions at the time of entry into the credit system affects a consumer’s credit profile over time. To do this, we estimate regressions that model credit outcomes as a function of the unemployment rate at entry. Our analysis of entry timing and product type point to selection bias arising from a simple regression of credit outcomes on unemployment at entry. In order to circumvent potential endogeneity arising from the entry decision, we use the unemployment rate at age 18—the youngest age at which the typical consumer is eligible for credit—as an instrument for the unemployment rate at entry. The key identifying assumption is that the unemployment rate at age 18 only affects a borrower’s post-entry credit outcomes through the effect from unemployment rate in the year of entry. We can demonstrate that unemployment at 18

¹Our full model is also stratified by year of birth, which controls for any confounding effects related to credit access due to the implementation of the 2009 CARD Act (Debbaut et al., 2016; Cooper et al., 2022; Brown et al., 2022).

is uncorrelated with the timing of entry conditional on other observables, supporting the validity of our instrument. Using county-level unemployment at age 18 and in the year of entry provides rich variation in economic conditions and also breaks the mechanical link between age, cohort and time effects that would arise if we used more aggregated measures such as the national unemployment rate.

Using this instrumental variables approach, we trace out the credit risk profile of entrants over the first 10 years after entry. Our point estimates imply that a one percentage point increase in the unemployment rate in the year of entry increases a consumer's credit score by 2.7 points two years after entry. This difference persists and remains statistically significant up to 10 years after entry, falling to 1.3 points for each additional percentage point increase in the unemployment rate at entry. These are meaningful differences given that the trough-to-peak change in unemployment rate during the 2007-2009 recession averaged 5.5 percentage points. Moreover, these estimates likely underestimate the relationship between unemployment at entry and credit scores because we cannot directly control for the effect of poor economic conditions on income, which is expected to bias our results downward.²

Our results suggest that the business cycle has a significant impact on entry into the credit market. This is reflected in delayed entry into the credit market as well as higher consumer credit scores among those that enter under relatively worse economic conditions. This implies that borrowers who are able to enter the credit market during relatively worse economic periods may be better off doing so although the mechanism driving this benefit is unclear.

In order to explore these differences, we first consider the evolution of credit score conditional on the entry product. Borrowers who enter with student loans during higher periods of unemployment have slightly lower scores 6-8 years after entry compared to those who enter in lower unemployment periods. This approximately aligns with the timing around when

²Our regression results do control for the current-period county-level unemployment rate to account for the effect of contemporaneous economic conditions, separate from the impact of initial economic conditions. To some extent this will serve as a proxy for borrower income.

student loan repayment initiates. Borrowers who enter with a credit card under relatively worse economic conditions have lower credit scores, on average, compared to those entering during relatively better economic conditions. These differences grow 6-8 years after entry and remain economically meaningful for at least 10 years after entry. Finally, borrowers who enter with an auto loan have relatively higher credit scores that persist for at least 10 years after entry. This may indicate that borrowers who enter the credit market with auto loans during relatively worse economic periods are better borrowers, on average, compared to similar borrowers who enter during better economic periods. In addition, we find changes in the probability of being delinquent on any credit account that align with our estimated changes in credit score by entry product type. Overall, the findings point to the entry product playing at least some role in predicting a borrowers credit quality in the first ten years after entry.

Next, we use the instrumental variables model to analyze the composition of the credit portfolio over time. The model shows that two years after entry the average consumer is 2.8 percentage points more likely to have a student loan for each one percentage point increase in unemployment at entry. This differential narrows but persists over time, but remains over 0.9 percentage points after 10 years. In contrast, consumers are 1.1 percentage points less likely to have an auto loan two years after entry for each percentage point increase in unemployment, but this effect only persists up to four years post entry. By six years post entry, a one point increase in the unemployment rate at age 18 makes borrowers more likely to have an auto loan. Similar patterns exist with credit card limits. Higher unemployment at entry generates a statistically significant and modest decrease in credit card limits that persists for at least eight years post entry.

Finally, we consider how the unemployment rate at entry affects product terms at origination for credit tradelines opened after entry into the credit market. Focusing on auto loans, mortgage loans, and credit cards, we estimate the relationship between loan terms and the unemployment rate at entry using a robust set of controls including the borrower's

credit score at origination. We do not find any clear evidence that the unemployment rate at entry affects the terms and characteristics of credit products. However, there is evidence that consumers take out smaller loans after entry when the unemployment rate was higher at the time they entered the credit market. These effects are modest in size but statistically significant for all three product types. This result underscores how the timing of entry into the credit market may have lasting effects on credit outcomes.

The only paper that we are aware of that studies entry into the credit system is descriptive work by Brevoort and Kambara 2017. Focusing on the transition to becoming credit visible (i.e., having an initial consumer credit report), they show that entry into the credit system typically occurs at younger ages. The most common initial entry product is credit cards followed by student loans. Their analysis establishes a number of other facts about becoming credit visible but does not attempt to identify these relationships within a causal framework.

Existing studies on entry into the credit system have been limited in their scope due to the level of detail required to examine the dynamics of credit entry, which requires information on both the exact entry product and the timing of entry. Related studies have focused on credit card debt either by using detailed data on credit card tradelines (Santucci, 2015, 2016) or using aggregated credit data that cannot identify individual credit card accounts (Debbaut et al., 2016). These limitations make it difficult to identify entry. To our knowledge, this is the first paper to provide a dynamic and causal analysis of entry into the credit system.

Our work is further motivated by an existing literature in labor economics that considers the effects of graduating in a recession on the labor market outcomes and earnings of individuals. This literature finds that graduating in a recession leads to long-term reductions in earnings (Kahn, 2010; Oreopoulos et al., 2012). Other work in this vein finds mixed evidence on family formation (Kawaguchi and Kondo, 2020). Identification of these effects relies on the fact that the state of the economy is unpredictable with respect to the timing of graduating from college. Similarly, it is difficult to anticipate economic conditions at the time a consumer's initial demand for credit arises, yet our time-series evidence shows significant

variation in the number of entrants and the demand for credit products that is correlated with the national business cycle.

This paper is organized as follows: Section 2 provides information on the data and sample of consumers used in the analysis; Section 3 reports evidence on the effects of initial economic conditions on entry into the credit market; Section 4 reports evidence on initial economic conditions and credit outcomes later in life; and Section 5 concludes.

2 Data and Sample Selection

The primary data for this paper is the CFPB Consumer Credit Panel (CCP). The CCP is a 1-in-48 sample of de-identified consumer credit records from one of the three nationwide consumer reporting agencies. The credit records available in the CCP include account-level records of credit items, or “tradelines”. The presence of tradeline-level data for all account types is a key advantage of our data, as it allows us to precisely identify when consumers first acquire a credit product and which tradeline serves as the entry product.

The CCP is constructed as a series of snapshots of consumers’ credit reports, with annual snapshots beginning in September 2001, quarterly snapshots beginning in September 2004, and monthly snapshots beginning in June 2020. We use tradeline data through December 2021. In addition to tradeline data, the CCP includes disaggregated data on public records associated with a consumer—most notably bankruptcy filings—and data on credit inquiries generated from an application for credit.³ The CCP also includes quarterly data on credit scores, birth year and consumers’ Census tract of residence.⁴

³The CCP only contains hard inquiries, which result from a consumer-initiated application for credit. Such inquiries are visible to other prospective creditors for two years and are considered in the calculation of credit scores. This is distinct from “soft” inquiries, which are only visible to the consumer and are not used in credit scores. Such inquiries are often used by current creditors to monitor the accounts of their customers or by creditors seeking to market unsolicited “pre-screened” credit offers to consumers. The CCP does not have information on soft inquiries.

⁴The geography data is somewhat complex. From June 2010 on, the consumer reporting agency provides the census tract of the best known address for each consumer as of the end of each quarter. The consumer reporting agency also provided CFPB with a list of the census tracts for the 25 best historical addresses for each consumer as of December 2012, including date ranges for each. We are grateful to Giordano Palloni for

We define entry into the credit market as the opening of a consumers' first credit account in their own name. This definition excludes credit accounts where another person is responsible (i.e., co-signed accounts) or accounts where the consumer is an authorized user but is not responsible for making payments. The definition also excludes non-credit tradelines, such as collections tradelines reported by third-party debt collectors.⁵ As a result, it is possible for consumers to be credit visible (i.e., have a credit record that we can observe in the CCP) without having entered the credit market according to our definition. We include non-credit and authorized user accounts in our analysis where relevant, but we do not consider a consumer as having entered when such tradelines appear.

Our sample of credit entrants consists of all consumers in the CCP where we can be confident that we observe their first-ever non-authorized user credit tradeline. We include all consumers who were born in 1977 or later. Because credit accounts should remain on a consumers' credit report for at least seven years, consumers born in 1977 would have been at most age 24 in 2001, and all accounts opened by these consumers after age 18 should be visible even in our September 2001 snapshot. For consumers born before 1977, we exclude consumers who appear in the 2001, 2002 or 2003 CCP snapshots, as we cannot be confident that the first account we observe is the consumer's first account ever. Empirically, gaps of credit visibility longer than three years are rare in the CCP, occurring among fewer than 0.5 percent of consumers, so it is not necessary to extend this exclusion to consumers who appear in 2004. That is, if a consumer appears in the 2004 snapshot of the CCP, and not in the 2001–2003 snapshots, it is highly unlikely that the consumer had a potential entry tradeline in 2000 or earlier, and the earliest tradeline we observe in 2004 is very likely to be the entry tradeline for that consumer.

We make a few additional exclusions from our sample to remove cases where we are not confident we are observing entry, or where it seems that some information must be wrong.

sharing the code used to convert the historical address list into an imputed quarterly panel of census tracts for consumers present in the CCP data between 2001 and 2010

⁵This is a somewhat different definition from prior work focused on credit invisibles (Brevoort et al., 2015; Brevoort and Kambara, 2017; Brevoort et al., 2018)

We exclude consumers who appear to have tradelines before age 17,⁶ consumers who do not enter before age 45, consumers who have credit records but never enter, and consumers who have missing year of birth for the entirety of the CCP data.

Beyond the CCP data, we obtain county-level monthly unemployment rates from the Bureau of Labor Statistics’ Local Area Unemployment Statistics, and census tract demographics from the 2000 Decennial Census and the 2005-2019 American Community Survey 5-year estimates.⁷

Table 1 provides summary statistics for our sample of entrants. Although many consumers enter at or around age 18, many do not—the mean age of entry is 22.7 with an interquartile range of 19-24. First observed credit scores are relatively low, with an average score of about 652, which is on the upper end of the traditional “sub-prime” range. A little more than a quarter of consumers have some tradelines prior to entering with a non-authorized user credit account. These are split about evenly between consumers who were an authorized user on another account and consumers with collections tradelines, with little overlap. Almost half of our sample applies for a mortgage at some point in the sample period, and a little less than four percent ever file for bankruptcy. Our full sample of entrants includes over 2.3 million unique consumers.

3 Effects of Initial Economic Conditions on Entry into the Credit Market

Economic conditions may affect when, whether, and how young consumers are able to acquire credit. Recessions, in particular, can impact the supply of credit through reducing creditors’

⁶For some analyses we retain consumers with tradelines opened at 17, as these may include student loans originated before a student’s 18th birthday.

⁷We impute census tract characteristics between 2001 and 2006 by linearly interpolating between the 2000 Decennial Census values and the values from the 2005–2009 5-year estimates. Where relevant we carry forward the 2015–2019 ACS estimates through the most recent period, and carry backward the 2000 Decennial estimates for years prior to 2000.

liquidity and potentially reducing their appetite for the credit risk of lending to consumers, especially those without a prior credit history. Figure 1 shows the distribution of year of entry across our sample with shaded regions representing NBER defined recessions. Despite our restriction on consumers appearing in the 2001–2003 CCP waves, the data show a relatively consistent volume of entrants starting in 2000. More notably, there are drops in the number of entrants in recession years. This pattern is consistent with reduced credit access and suggests that the timing of entry may be affected by economic conditions.

Similarly, economic conditions may change the *way* in which consumers enter the credit market. Figure 2 plots the share of entrants for each year from 2000—2020 by product type: student loans, auto loans, general purpose credit cards, and retail or “store” credit cards. Again, the shaded regions represent national recessions. There is a clear countercyclical pattern in the products consumers use to enter the credit market. Almost half of all entrants in 2007 entered with a credit card and near 20 percent entered with a student loan. By 2010, the relative shares of the two products had switched, with 40 percent of new entrants entering with a student loan and around 30 percent with a credit card. Given that Figure 1 shows that the number of entrants dropped significantly during the same time period, it isn’t necessarily the case that take-up of student loans doubled. Student loans appear to be positively correlated with recessions and credit cards appear to be negatively correlated with recessions throughout the time series. These patterns are consistent with the literature in labor economics showing greater college enrollment during poor labor markets. Moreover, credit cards and auto loans require at least some verification of income for underwriting, whereas student loans do not. This makes access to student loans easier compared to credit cards and auto loans during high unemployment periods.

Combining the results from Figures 1 and 2, it is clear that the makeup of who enters and how they enter is sensitive to national economic conditions. Understanding this relationship is vital for identifying the impact of economic conditions at the time of entry on later credit outcomes, which could generate selection in the characteristics of which consumers enter at

different points in the business cycle. Furthermore, the impact of economic conditions on credit entry is a question of independent interest and represents the first main contribution of this paper.

3.1 Empirical Models of Credit Market Entry

We first explore the effect of economic conditions on entry into the credit market. The evidence above suggests that credit market entry is impacted by national economic shocks both with respect to the number of entrants into the credit market and the product that new entrants choose. We exploit local variation in unemployment rates over time to identify the effect of economic conditions on entry.

We use a Cox proportional hazard model to measure $h^y(t)$ the probability that a consumer born in year y enters the credit market t quarters after the first quarter of the year they turn 18, conditional on not entering previously, as

$$h^y(t) = h_0^y(t) \exp(\delta U_{yt} + \beta X_{it}), \quad (1)$$

where $h_0^y(t)$ is a baseline hazard rate, and is multiplied by a function of the contemporaneous county unemployment rate U_{yt} and a vector of potentially time varying characteristics X . The Cox model allows us to leave the baseline hazard unspecified and fully flexible. Further, in most specifications we stratify the baseline hazard by year of birth, allowing for a separate baseline hazard function for each cohort. Although we use continuous county unemployment rate in our results, we find substantively similar results using other measures of economic conditions.⁸

In the hazard model, consumers are followed starting from the first quarter of the year they turn 18 until they enter the credit market with a non-authorized user credit account, or

⁸Specifically, our results are robust to using a binary indicator for a local recession, based on rising county unemployment rate, as well as both continuous and binary measures for changes in the State Coincident Indexes produced by the Federal Reserve Bank of Philadelphia [CITE].

until they are censored by reaching the end of our data in December 2021. One key limitation of this analysis is that by construction, every consumer in our sample eventually enters. We do not account for consumers who have not entered the credit market by December 2021 when our sample ends.

A concern in our analysis is properly accounting for the effects of the 2009 CARD Act, which could bias our results if not properly accounted for. Particularly relevant to our analysis is Title 3 of the CARD Act, which substantially reduced access to credit cards for individuals under age 21 starting in 2009 (Debbaut et al., 2016). One advantage of the Cox model is that it can compare individuals within strata and event time. Thus, any effects of the CARD Act are fully accounted for in our specification by stratifying by year of birth.⁹

We empirically analyze the relationship between the business cycle and the type of credit product consumers ultimately enter with. We estimate a set of linear probability models for the probability that the first credit product a consumer acquires, Y , is of type $y \in \{Auto, Student, Credit Card, Retail Card, Other\}$ for a consumer i born in year b :

$$P(Y_{ibcg} = y) = \beta U_{cg0} + \gamma U_{cg18} + \phi_b + \alpha_c + \theta_g \varepsilon_{icg}, \quad (2)$$

where c indexes year of entry, g indexes the consumers' geography of residence (county) at the time of entry, U_{cg0} is the average unemployment rate for county g in year c (the year the consumer enters), and U_{cg18} is the average unemployment rate for county g in the year the consumer turns 18. The models include fixed effects for county of entry, year of entry, and year of birth.

3.2 Empirical Evidence on Hazard of Entry

Table 2 reports hazard ratios (exponentiated coefficients) from our hazard model of entry with varying sets of controls. Column 1 reports the single baseline hazard rate from a simple,

⁹Title 3 of the CARD Act impacts consumers who are under the age of 21 when the calendar year is 2009 or later. The Cox model stratified by birth year is equivalent to a regression with event-time by birth year fixed effects, so there is no remaining within-cell variation in CARD Act status.

non-stratified model accounting only for the contemporaneous county unemployment rate. Here we see a substantial effect of unemployment on the probability of entry with a 1 point increase in unemployment rate reducing the hazard by almost 6 percent (hazard ratio of 0.941). However, a large portion of this effect is due to variation across birth cohorts that is correlated with unemployment (including the effect of Title 3 of the CARD act). When we stratify the baseline hazard by year of birth in Column 2, the effect of unemployment is significantly smaller, but still negative and precisely estimated. The addition of controls in Columns 3 and 4 has little added effect on the hazard ratio for the county unemployment rate. Specifically, Column 3 adds controls for pre-entry credit record items. The presence of authorized user accounts and inquiries increases the probability of entry, while consumers with collection tradelines are less likely to enter.

Finally, Column 4 adds census tract characteristics based on the first census tract where the consumer is observed in the CCP. Consumers who reside in census tracts with a higher percent of Black and Hispanic residents are half as likely to enter at any point in time. The association with income and education is less clear—consumers in higher income census tracts are less likely to enter, while consumers in census tracts with more high school dropouts are more likely to enter.

Overall, our preferred specification is Column 4 which shows a reduction in the hazard of roughly 1.6 percent (hazard ratio of 0.984) in response to a 1 point increase in the unemployment rate. This equates to a 3.6 percent decrease in the probability of entry after the 2001 recession (2 percent increase in unemployment) and a 9.5 percent decrease after the 2007 recession (5.5 percent increase in unemployment). Furthermore, the stability of the estimates point to a causal relationship between entry into the credit market and economic conditions.

3.3 Empirical Evidence on Entry Product

We present results on the probability of entering with different credit products in Table 3. Each column contains the coefficients on the unemployment rate at age 18 and the unemployment rate in the year of entry, where the outcome is an indicator for entering with a particular credit product type. From left to right, the outcomes are entering with an auto loan, entering with a student loan, entering with a general purpose credit card, entering with a retail card, and entering with another product.

The results show that entry product is closely related to both the unemployment rate at age 18 and the unemployment rate at entry. Borrowers are 0.49 and 0.42 percentage points more likely to enter with a student loan for each one percentage point increase in unemployment at age 18 and unemployment at entry, respectively. Borrowers are also 0.19 percentage points more likely to enter with a retail card when the unemployment rate at entry is higher, but the point estimate for the unemployment rate at age 18 is close to zero and not statistically significant despite a small standard error. In contrast, borrowers are less likely to enter with an auto loan, credit card, or other credit account when contemporary unemployment increases as well as when unemployment was higher when they turned 18. A one percentage point increase in unemployment at entry is associated with a 0.45 percentage point decrease in the probability of entering with an auto loan. The effect of unemployment at 18 on entering with an auto loan is smaller, with decreasing the likelihood of entering with an auto loan by 0.13 percentage points. Borrowers are 0.19 percent less likely to enter with a credit card when the unemployment rate at 18 increases by one percentage point, but unemployment at entry does not appear to affect the probability of entering with a credit card. Borrowers also are 0.19 and 0.10 percentage points less likely to enter with other types of credit given a one percentage point increase in unemployment at 18 and unemployment at entry, respectively.

Overall, the results support a close relationship between the business cycle and entry product that is tied to both unemployment at age 18 and unemployment at entry, depending

on the product type. We note that this is not inconsistent with the earlier finding that unemployment at age 18 is not related to acquiring a first credit account, conditional on observables. Unlike in the survival analysis, entry product can only be observed conditional on entry into the credit system so we can not disentangle the relationship between entry timing and the product type. This difference may explain the differing relationship for unemployment at age 18 across models.

4 Initial Economic Conditions and Credit Outcomes Later in Life

Next, we examine the relationship between economic conditions at entry and later credit outcomes. Similar to the literature on scarring in the labor market, we are interested in whether entering the credit market during a recession has adverse consequences on consumer credit and for how long the effect persists. We first describe our basic empirical model, then present results on credit outcomes, and finally describe results on the terms of credit consumers are able to obtain.

4.1 Model

We model a credit outcome y for consumer i , observed k years after entering the credit market in calendar year e and county c , as:

$$y_{iecb}^k = \beta^k Urate_Entry_i + \gamma^k Urate_Current_{ik} + \alpha_c^k + \phi_e^k + \theta_b^k + \varepsilon_{iecb}^k \quad (3)$$

where b indexes year of birth, $Urate_Entry_i$ denotes the unemployment rate in the consumer's county of residence in the calendar year they enter, and $Urate_Current_{ik}$ denotes the unemployment rate in the consumer's county of residence in year $e + k$ (which may differ from the county where the consumer resided at entry). That is, our main specification

regresses an outcome on the unemployment rate in the consumer's county of residence in the year they entered the credit market, the contemporaneous unemployment rate in the consumer's county of residence k years later, and fixed effects for county of entry, year of entry and year of birth. Thus, we are focusing on within-county, over-time variation in unemployment. We estimate separate regressions for different values of k to map out how credit outcomes evolve up to 10 years after entry.

From our results in section 3 we know that unemployment in a consumer's county reduces the probability that they are able to enter the credit market at all. Thus, the unemployment rate at the time of entry will influence the composition of our sample in ways that may be correlated with later outcomes. As a result, estimating equation (3) with OLS may be subject to bias. To address this, following a similar approach in Kahn (2010), we instrument for the county unemployment rate in the year a consumer enters with the county unemployment rate in the year the consumer turns 18. The unemployment rate at age 18 is correlated with the unemployment rate at the time of entry, but is independent of the factors that determine when and whether a consumer enters the credit market. Thus, we argue that unemployment at age 18 only affects later credit outcomes through its correlation with unemployment at entry and thus meets the exclusion restriction required for identification. Our hazard model in Table 2 supports this, as we find that unemployment at age 18 has no effect on the hazard of entry when we also account for contemporaneous unemployment. Unemployment at age 18 is a strong instrument for unemployment at entry, with a first stage F-statistic on the order of 10^5 in all specifications.

To further avoid selection issues, for this analysis we focus on consumers who entered the credit market between 2000 and 2011. Figure 1 showed that our coverage of entrants whose first account was opened before 2000 is somewhat limited, while restricting to entrants from 2011 and earlier enables us to look at a consistent sample for a full 10 years after entry.

4.2 Main Results

4.2.1 Credit Scores

We begin by focusing on credit score, as a summary measure of credit health. Table 4 shows regression coefficients for the effect of unemployment at entry on credit score 2, 4, 6, 8 and 10 years after entering the credit market. The first two columns show results for the level of credit score, using OLS and IV respectively. The third and fourth columns show results for the probability the consumer has a non-missing score, a measure of whether the consumer is “scorable” (Brevoort et al., 2015). We find that higher unemployment rate at entry leads to persistently higher credit scores for at least 10 years after entry, with each point of initial unemployment rate associated with a credit score about two points higher. Accounting for selection into entry is important, as we get significantly larger coefficients when instrumenting for initial unemployment with unemployment at age 18. To give our results a sense of scale, the median increase in county unemployment rate during the 2007–2009 recession was about 5.4 percentage points; this is roughly equal to two standard deviations of our measure of unemployment rate at entry. A change in unemployment this large in the year of entry leads to credit scores about 15 points higher two years after entry.

To explain some of the patterns in our main results in Table 4, we next explore whether the effect of unemployment at entry varies depending on what product consumers enter with. As we showed in section 3, during recessions and when unemployment is higher, entrants are more likely to acquire student loans as their first credit product, and less likely to enter with a credit card account. These initial product choices may themselves drive later credit outcomes, and the consumers who ultimately switch entry products due to economic conditions may also respond differently to those conditions. We show results of this analysis in Table 5. As in Table 4, each cell shows the coefficient on unemployment in the year of entry from a separate regression. Panel A restricts the sample to consumers who entered with a student loan as their first product, Panel B restricts the sample to consumers who

entered with a credit card, and Panel C restricts the sample to consumers who entered with an auto loan. The first two columns in each panel show OLS and IV results with credit score as the outcome, and the next two columns show results with the probability of being at least 30-days past due on any credit account as the outcome.

Across these two outcomes, we see that some of the overall patterns we observe in the full sample are the combination of distinct patterns from entrants with different product types. For credit score, the overall pattern in Table 4 showed a positive effect of unemployment at entry on credit 2, 4 and 10 years after entry, with ambiguous effects at 6 and 8 years. Breaking the sample out by entry product in Table 5, we see that conditional on entering with a credit card or student loan, higher unemployment at entry causes lower credit scores primarily at 6 and 8 years post-entry, with little effect at other points in time. In contrast, conditional on entering with an auto loan, higher unemployment at entry had a strictly positive impact on credit score at all points in time. These patterns seem to be driven in part by delinquency behavior—for consumers who enter with credit cards, higher unemployment at entry seems to increase rates of delinquency 4–8 years after entry, corresponding to decreases in credit score. Conversely, for consumers who enter with auto loans, higher unemployment at entry has a persistent negative effect on delinquency after entry, although this effect is somewhat imprecisely estimated at some time periods.

In summary, it appears that conditional on entering with a credit card, consumers have worse credit outcomes when the unemployment rate was high at the time they entered, with lower credit scores and higher rates of delinquency. Conditional on entering with an auto loan, consumers who enter in times of higher unemployment have better outcomes, with higher credit scores and lower rates of delinquency. Outcomes conditional on entering with a student loan are somewhere in between.

4.2.2 Composition of the Credit Portfolio

Next, we examine how initial conditions affect the composition of the credit portfolio. Table A3 shows results for the effect of unemployment rate in the year of entry on the probability of having a student loan, the probability of having an auto loan, and the total credit limit across all credit cards belonging to the consumer. Again, the table presents separate regressions for outcomes observed 2, 4, 6, 8 and 10 years after entry.

Beginning with the first two columns, we find that higher unemployment at the time of credit market entry significantly increases the probability that consumers have a student loan, an effect that diminishes over time, but persists for at least 10 years. Adjusting for the effect of initial unemployment on selection into entry by instrumenting with unemployment at age 18 increases our estimates substantially. In our IV estimates, we find that for each point of unemployment rate at the time of entry, consumers are 2.8 percentage points more likely to have a student loan two years after entry. The effect diminishes over time, but consumers are still about 1 percentage point more likely to have a student loan 10 years later. Scaled by the 5.4 percentage point median increase in unemployment around the 2007–2009 recession, consumers would be 15 percentage points more likely to have a student loan after 2 years and almost 5 percentage points more likely after 10 years. This is significant given that on average about 33 percent of entrants in our sample have at least one student loan two years after entry, and 40 percent have at least one after 10 years.

Turning to the next two columns of Table A3, we find that consumers are initially less likely to acquire an auto loan when unemployment was higher at the time they enter the credit market. This effect diminishes over time, and longer term consumers are actually more likely to have an auto loan after 10 years. We get more positive effects in our IV regressions for 6, 8 and 10 years post-entry.

Finally, the last two columns of Table A3 show that unemployment at the time of entry lowers access to revolving credit, and the gap grows over time. In our IV specification, we find that each point of unemployment rate at the the time of entry lowers consumers' aggregate

credit card limit by \$84, and this gap grows to over \$200 after 8 years, although the gap seems to shrink by 10 years. This unusual pattern for revolving credit seems to reflect a composition of effects across consumers who enter with different types of credit product: In Appendix Table ?? we show that there is a large, consistent and precise negative effect of unemployment at entry on credit limits, conditional on entering with a credit card in the first place. Conditional on entering with a student loan or auto loan there are small and inconsistent patterns in the effect of unemployment at entry on credit limits over time.

4.3 Loan Terms

The labor literature on scarring finds that the effects are driven in part by lower quality initial job matches, which then impacts transitions to better matches through the early stages of a person’s career. The equivalent in the credit market would be affecting the loan terms of entry products, which could impact repayment patterns and thus the ability to acquire other and better credit products later on. To examine this, we modify our initial conditions regression framework slightly to focus on the terms and features of auto loans, credit cards and mortgages obtained by credit entrants in our sample. In this analysis, for each type of credit we condition on having that type of credit, with the unit of observation being a new account, and study the impact of unemployment at the time of credit-market entry on account characteristics. One key product feature is the interest rate, which we are only able to study for auto loans and mortgages. The CCP does not directly contain information on the interest rates. The rate can be inferred from the CCP data for auto loans and mortgages, but not credit cards.¹⁰ For all products and characteristics we focus on the first account of each type opened by the consumer (potentially the product they they

¹⁰For auto loans this is straightforward, as the interest rate can be directly calculated from term, monthly payment, and initial balance, which are contained in the data. For mortgages, monthly payment often contains additional charges such as property taxes and insurance, and cannot be used to back out interest rate. Instead, we employ the method of Shahidinejad (2022), which leverages balances at two points in time to simultaneously solve for interest rate and the principle and interest portion of the monthly payment. Because we have quarterly data in the CCP, rather than monthly, we modify the Shahidinejad (2022) method slightly by using balance-month pairs from the first 18 months of the life of the loan, rather than months 2–7.

entered the credit market with), and control for credit score and pre-entry tradelines as well as unemployment at origination, to account for consumer characteristics unrelated to initial labor market conditions that might affect the terms. We also include fixed effects for county, year of entry, year the account was opened, and year of birth.

We begin by examining characteristics of auto loans opened by entrants in our data. We show the results of this analysis in Table 7. The first column shows results for interest rate in percentage points, the second column shows results for term in months, and the last column shows results for the initial principle amount. Our estimates on interest rates are quite noisy—although our point estimates indicate a positive correlation between unemployment at entry and interest rate a 95 percent confidence interval includes increases or decreases of a whole percentage point in interest rate. We have more of a tight zero effect on the term of the loan, where we can easily reject increases or decreases of a single month. We do find a moderately sized and precise negative effect of unemployment at entry on the initial principal amount of a consumer’s first auto loan, which decreases by about \$100 per percentage point of unemployment.

Turning to mortgages, we show results in table 8. Here we focus on the first mortgage obtained by each consumer. The first column shows results for inferred interest rate, the second column shows results for the original principle balance, and the third column shows results for the probability of being a subsidized loan, such as an FHA or VA loan. Term is of less interest for mortgages, as there is less variation and the vast majority have a 30 year term. Unlike for auto loans, we find a tight zero effect of unemployment at entry on mortgage interest rates obtained later in life. Our point estimate is negative, and we can reject an increase of as little as 0.006 percentage points at 95 percent confidence. Like auto loans, however, we find that consumers who entered the credit market during periods of higher unemployment borrow less, with initial principle balances more than \$1550 lower per point of unemployment. This is almost 1 percent of the mean. We do not find that entrants are more likely to have a subsidized loan if they entered with high unemployment.

Finally, in Table 9 we show results on the characteristics of the first credit card account acquired by the entrants in our sample. The outcome in the column is the initial credit limit of the account, and the next four columns have as their outcomes indicators for being a secured credit card, being a retail or store card, being issued by a credit union, and being issued by one of the 10 largest credit card issuers in the CCP by number of outstanding accounts. Again, we are not able to study credit card interest rates, as the available fields in the CCP are not sufficient to back out the interest rate on revolving accounts. Similar to our results on auto loans and mortgages, we find that consumers who enter when unemployment is higher have lower credit limits on their first credit card. We find some effect of unemployment at entry on other credit card features, although the magnitudes are somewhat small. Even scaling by the 5.5 percent median increase in unemployment during the 2007–2009 recession, we would expect consumers to be just 0.2 percentage points more likely to have a secured credit card as their first credit card account (compared to a mean of 1.7 percent, 0.4 percent points more likely to have their first account through a credit union (mean of 3 percent), and about 1 percentage point less likely to open the account with a large bank (mean of 78 percent).

Overall, we don't find any clear evidence of an impact of unemployment at entry on the terms and characteristics of credit products obtained by young consumers, but we do find that conditional on obtaining credit, they obtain *less* credit of all three types studied.

5 Conclusion

In this paper, we show that entry into the credit market is tightly linked to the business cycle. Consumers experience both short- and long-term effects on their credit profile, with the latter often extending beyond the duration of a typical economic expansion or contraction. Our empirical results show that economic conditions affect whether, when and how consumers first acquire a credit account, and the direct effects on entry impact credit outcomes and the

terms of credit received for at least ten years after.

An implication of our findings is that the current consumer credit landscape may be shaped in important ways by economic events in years past. For instance, the total volume of outstanding student loans is an area of intense policy concern in the United States, with more than 1.6 trillion dollars in Federal student loans alone in 2022. Our results show that consumers are significantly more likely to enter with student loans when economic conditions are poor, and moreover we find that consumers who entered when unemployment was higher are still more likely to have student loans up to 10 years later. Given that standard repayment plans for student loans have a 10-year amortization period, generally beginning after the student graduates, our results suggest that the overall volume of student loan debt we are seeing today can be linked in part to the economic shocks of the 2007–2009 recession.

Better understanding of the dynamics of economic conditions and credit entry may help policymakers anticipate consumer credit outcomes during economic recoveries, and, therefore, may help guide policies supporting the consumer credit market during economic downturns. These are directions for future research and discussion.

References

- Brevoort, Kenneth and Michelle Kambara**, “Becoming Credit Visible,” 2017. Consumer Financial Protection Bureau Data Point.
- , **Jasper Clarkberg, Michelle Kambara, and Benjamin Litwin**, “The Geography of Credit Invisibility,” 2018. Consumer Financial Protection Bureau Data Point.
- , **Philipp Grimm, and Michelle Kambara**, “Credit Invisibles,” 2015. Consumer Financial Protection Bureau Data Point.

- Brown, Alexander, Daniel Grodzicki, and Paolina Medina**, “When Nudges Spill Over: Student Loan Use Under the CARD Act,” 2022. SSRN Working Paper: <https://ssrn.com/abstract=4129413>.
- Brown, Meta, Andrew Haughwout, Donghoon Lee, and Wilbert van der Klaauw**, “The Financial Crisis at the Kitchen Table: Trends in Household Debt and Credit,” *Federal Reserve Bank of New York: Current Issues in Economics and Finance*, 2013, 19 (2), 1–10.
- Cooper, Daniel, Olga Gorbachev, and Maria Jose Luengo-Prado**, “Consumption, Credit, and the Missing Young,” *Journal of Money, Credit, and Banking* (forthcoming), 2022.
- Debbaut, Peter, Andra Ghent, and Marianna Kudlyak**, “The CARD act and young borrowers: The effects and the affected,” *Journal of Money, Credit and Banking*, 2016, 48 (7), 1495–1513.
- Goodman, Laurie**, “Quantifying the Tightness of Mortgage Credit and Assessing Policy Actions,” 2017. Housing Policy Finance Center Working Paper, Urban Institute.
- Kahn, Lisa B**, “The long-term labor market consequences of graduating from college in a bad economy,” *Labour economics*, 2010, 17 (2), 303–316.
- Kawaguchi, Daiji and Ayako Kondo**, “The effects of graduating from college during a recession on living standards,” *Economic Inquiry*, 2020, 58 (1), 283–293.
- Oreopoulos, Philip, Till Von Wachter, and Andrew Heisz**, “The short-and long-term career effects of graduating in a recession,” *American Economic Journal: Applied Economics*, 2012, 4 (1), 1–29.
- Santucci, Larry**, “A Take of Two Vintages: Credit Limit Management Before and After the CARD Act and Great Recession,” 2015. Federal Reserve Bank of Philadelphia Payment Cards Center Discussion Paper.

– , “What Happened to the Revolving Credit Card Balances of 2009?,” 2016. Federal Reserve Bank of Philadelphia Payment Cards Center Discussion Paper.

Shahidinejad, Andrés, “Are (nonprofit) banks special? The economic effects of banking with credit unions,” 2022. Working Paper.

Table 1: Summary Statistics of Consumers Entering the Credit Market 2001–2021

	Mean	SD	Min	P25	P75	Max
Age at Entry	22.7	6.11	17	19	24	45
First Credit Score	651.8	78.3	378	610	709	850
UE Rate at Age 18	5.91	2.58	0.45	4.12	7.18	38.3
Pre-Entry Tradelines	0.28	0.45	0	0	1	1
Pre-Entry Authorized User	0.14	0.35	0	0	0	1
Pre-Entry Collection	0.15	0.36	0	0	0	1
Ever Mortgage Inquiry	0.46	0.50	0	0	1	1
Ever Filed Bankruptcy	0.038	0.19	0	0	0	1
N	2,341,471					

Table 2: Effect of Economic Conditions on Hazard of Acquiring First Credit Account

	(1)	(2)	(3)	(4)	(5)
County Unemployment Rate at time t	0.940*** (0.00550)	0.982** (0.00606)	0.982** (0.00606)	0.984** (0.00603)	0.982** (0.00612)
Total Authorized User Accounts			1.245*** (0.00497)	1.230*** (0.00569)	1.230*** (0.00569)
Total Collection Tradelines			0.981*** (0.00279)	0.969*** (0.00394)	0.969*** (0.00393)
Total Observed Inquiries			1.074*** (0.00325)	1.088*** (0.00384)	1.088*** (0.00384)
Census Tract % Black				0.480*** (0.0218)	0.482*** (0.0213)
Census Tract % Hispanic				0.285*** (0.0219)	0.285*** (0.0219)
Census Tract Median Income (\$0000s)				0.977*** (0.00343)	0.977*** (0.00342)
Census Tract % < High School				4.333*** (0.544)	4.320*** (0.544)
Census Tract % Non-English Speaker				0.310*** (0.104)	0.310*** (0.104)
County Unemployment Rate at Age 18					1.003 (0.00277)
Observations	36889696	36889696	36889696	34849883	34844885
Stratified by Year of Birth		X	X	X	X

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Exponentiated coefficients reported as hazard ratios, from a Cox proportional hazard regression. Standard errors clustered by state reported in parentheses.

Table 3: Estimates of Economic Conditions at Age 18 on Entry Product

	Probability First Credit Account Is				
	(1) Auto Loans	(2) Student Loans	(3) Credit Cards	(4) Retail Cards	(5) Other
U-Rate at Age 18	-0.0013*** (0.0002)	0.0049*** (0.0005)	-0.0019*** (0.0004)	0.0002 (0.0002)	-0.0019*** (0.0003)
U-Rate at Entry	-0.0045*** (0.0003)	0.0042*** (0.0005)	-0.0005 (0.0004)	0.0020*** (0.0003)	-0.0011*** (0.0003)
Observations	2244803	2244803	2244803	2244803	2244803
Outcome Mean	0.11	0.23	0.45	0.11	0.09

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ The table reports coefficient estimates from a set of linear regressions of entry product type on county-level unemployment rate at age 18. All regressions include a control for county-level unemployment at entry, and county, year of entry, and year of birth fixed effects. Standard errors are clustered by county and year of entry.

Table 4: Effect of Initial Unemployment Rate on Credit Scores Later In Life

Years Since Entry	Credit Score		Probability Scored	
	OLS	IV	OLS	IV
2	1.14*** (0.14)	2.71*** (0.42)	-0.00054 (0.00045)	0.0055*** (0.0012)
4	0.38* (0.15)	1.21*** (0.36)	-0.00000058 (0.00038)	0.0043*** (0.0010)
6	-0.39* (0.15)	0.096 (0.36)	0.0013** (0.00050)	0.0041*** (0.00099)
8	-0.65*** (0.14)	-0.038 (0.37)	0.0026*** (0.00047)	0.0025** (0.00095)
10	0.39* (0.16)	1.30*** (0.35)	0.0020*** (0.00048)	0.0027** (0.00083)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Each cell is the coefficient on unemployment rate in the year a consumer enters the credit market from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. IV columns instrument for the unemployment rate at entry with the unemployment rate at age 18. Standard errors clustered by county-entry year interactions reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Effect of Initial Unemployment Rate on Later Credit Outcomes, By First Credit Product

Years Since Entry	Credit Score		Any Account 30DPD	
	OLS	IV	OLS	IV
<i>Panel A: Entered with Student Loan</i>				
2	0.72*** (0.18)	0.52 (0.28)	-0.0026* (0.0011)	-0.0047** (0.0016)
4	-0.12 (0.22)	-0.34 (0.32)	0.000070 (0.0011)	-0.0026 (0.0017)
6	-0.88*** (0.23)	-1.14** (0.37)	0.0031** (0.0011)	0.0028 (0.0018)
8	-1.06*** (0.23)	-1.20** (0.38)	0.0022* (0.0011)	0.0022 (0.0018)
10	0.43 (0.25)	0.61 (0.35)	-0.00033 (0.00097)	0.00025 (0.0016)
<i>Panel B: Entered with Credit Card</i>				
2	0.27 (0.18)	0.92 (0.49)	-0.0024** (0.00075)	-0.00077 (0.0019)
4	-0.34 (0.19)	-0.66 (0.41)	-0.00031 (0.00085)	0.0065*** (0.0018)
6	-0.93*** (0.20)	-2.12*** (0.44)	0.0020* (0.00086)	0.0085*** (0.0019)
8	-1.00*** (0.19)	-2.34*** (0.44)	0.0035*** (0.00076)	0.0058** (0.0019)
10	-0.12 (0.18)	-1.02* (0.41)	0.0013 (0.00065)	-0.000021 (0.0017)
<i>Panel C: Entered with Auto Loan</i>				
2	0.52 (0.33)	3.22* (1.30)	-0.0038* (0.0017)	-0.011 (0.0060)
4	0.71* (0.34)	3.22** (1.23)	-0.00047 (0.0016)	-0.011 (0.0061)
6	-0.027 (0.36)	2.15 (1.31)	-0.000072 (0.0017)	-0.013* (0.0066)
8	-0.54 (0.37)	2.33 (1.29)	0.0034* (0.0017)	-0.013* (0.0063)
10	0.11 (0.37)	3.98*** (1.21)	0.0038* (0.0015)	-0.013* (0.0057)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Each cell is the coefficient on unemployment rate in the year a consumer enters the credit market from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. IV columns instrument for the unemployment rate at entry with the unemployment rate at age 18. Standard errors clustered by county-entry year interactions reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Effect of Initial Unemployment Rate on Credit Held Later in Life

Years Since Entry	Any Student Loan		Any Auto Loan		Total CC Limit	
	OLS	IV	OLS	IV	OLS	IV
2	0.013*** (0.00065)	0.028*** (0.0021)	-0.0093*** (0.00056)	-0.011*** (0.0015)	-20.1 (11.2)	-84.4** (26.7)
4	0.013*** (0.00064)	0.023*** (0.0019)	-0.0071*** (0.00060)	-0.0077*** (0.0014)	-16.4 (13.7)	-111.1*** (32.7)
6	0.0091*** (0.00062)	0.016*** (0.0019)	-0.0024*** (0.00061)	0.0028 (0.0016)	-36.4 (19.0)	-181.0*** (43.8)
8	0.0066*** (0.00061)	0.010*** (0.0018)	0.0015** (0.00059)	0.0086*** (0.0016)	-64.5** (24.2)	-206.2*** (54.4)
10	0.0067*** (0.00062)	0.0092*** (0.0016)	0.0029*** (0.00060)	0.0059*** (0.0015)	59.1* (28.2)	-34.8 (60.4)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Each cell is the coefficient on unemployment rate in the year a consumer enters the credit market from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. IV columns instrument for the unemployment rate at entry with the unemployment rate at age 18. Standard errors clustered by county-entry year interactions reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Effect of Unemployment Rate At Credit-Market Entry on Characteristics of Auto Loans Obtained Later in Life

	Interest Rate	Term (Months)	Principle Amount
U-Rate at Entry	0.030 (0.69)	0.051 (0.031)	-103.8*** (16.9)
Credit Score	-0.047*** (0.0044)	0.013*** (0.00020)	20.2*** (0.11)
U-Rate at Origination	0.18 (0.26)	-0.062*** (0.012)	-2.72 (6.33)
Pre-Entry AU	-1.52 (0.93)	0.021 (0.043)	1017.4*** (22.9)
Pre-Entry Collection	0.98 (1.03)	-0.88*** (0.047)	-455.2*** (25.4)
<i>N</i>	1161221	1161221	1161221
Outcome Mean	9.48	58.5	16712.4

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Unit of observation is an auto loan opened by a consumer who entered the credit market by opening a non-authorized user credit account between 2001 and 2021. All columns instrument for unemployment rate in the year of entry with unemployment rate in the year the consumer turned 18. All specifications include fixed effects for county, year account was opened, year of birth, and year of first credit market entry. Standard errors clustered by county reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Effect of Unemployment Rate At Credit-Market Entry on Characteristics of Mortgages Obtained Later in Life

	Interest Rate	Principle Amount	Subsidized Loan
U-Rate at Entry	-0.00049 (0.0028)	-1574.4*** (377.1)	-0.0013 (0.0013)
Credit Score	-0.0030*** (0.000025)	410.8*** (3.44)	-0.0030*** (0.000012)
U-Rate at Origination	-0.0070*** (0.0010)	-3386.1*** (138.8)	0.0075*** (0.00047)
Pre-Entry AU	-0.0097** (0.0037)	19803.1*** (497.3)	-0.066*** (0.0017)
Pre-Entry Collection	0.049*** (0.0056)	-16684.6*** (762.2)	0.076*** (0.0026)
<i>N</i>	450042	450042	450042
Outcome Mean	4.22	224585.1	0.43

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Unit of observation is a first-lien mortgage opened by a consumer who entered the credit market by opening a non-authorized user credit account between 2001 and 2021. All columns instrument for unemployment rate in the year of entry with unemployment rate in the year the consumer turned 18. All specifications include fixed effects for county, year account was opened, year of birth, and year of first credit market entry. Standard errors clustered by county reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: Effect of Unemployment Rate At Credit-Market Entry on Characteristics of First Credit Card Obtained Later in Life

	Initial Limit	Secured Card	Retail Card	Credit Union	Large Issuer
U-Rate at Entry	-24.4*** (4.41)	0.00032*** (0.000069)	0.00076*** (0.000092)	0.00031 (0.00026)	-0.0017*** (0.00022)
Credit Score	25.4*** (0.034)	-0.00020*** (0.00000053)	-0.000033*** (0.00000071)	-0.000018*** (0.0000020)	0.0012*** (0.0000017)
U-Rate at Origination	-28.0*** (1.76)	-0.00048*** (0.000028)	-0.0015*** (0.000037)	0.0030*** (0.00010)	0.0012*** (0.000087)
Pre-Entry AU	334.4*** (6.28)	-0.0047*** (0.000098)	-0.0070*** (0.00013)	-0.010*** (0.00037)	0.0042*** (0.00031)
Pre-Entry Collection	58.1*** (8.19)	0.0077*** (0.00013)	0.0059*** (0.00017)	0.0086*** (0.00048)	-0.041*** (0.00041)
<i>N</i>	12496790	12496790	12496790	12496790	12496219
Outcome Mean	2960.5	0.017	0.030	0.36	0.78

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Unit of observation is a the first credit card account opened by a consumer who entered the credit market by opening a non-authorized user credit account between 2001 and 2021. IV columns instrument for unemployment rate in the year of entry with unemployment rate in the year the consumer turned 18. All specifications include fixed effects for county, year account was opened, year of birth, and year of first credit market entry. Standard errors clustered by county reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

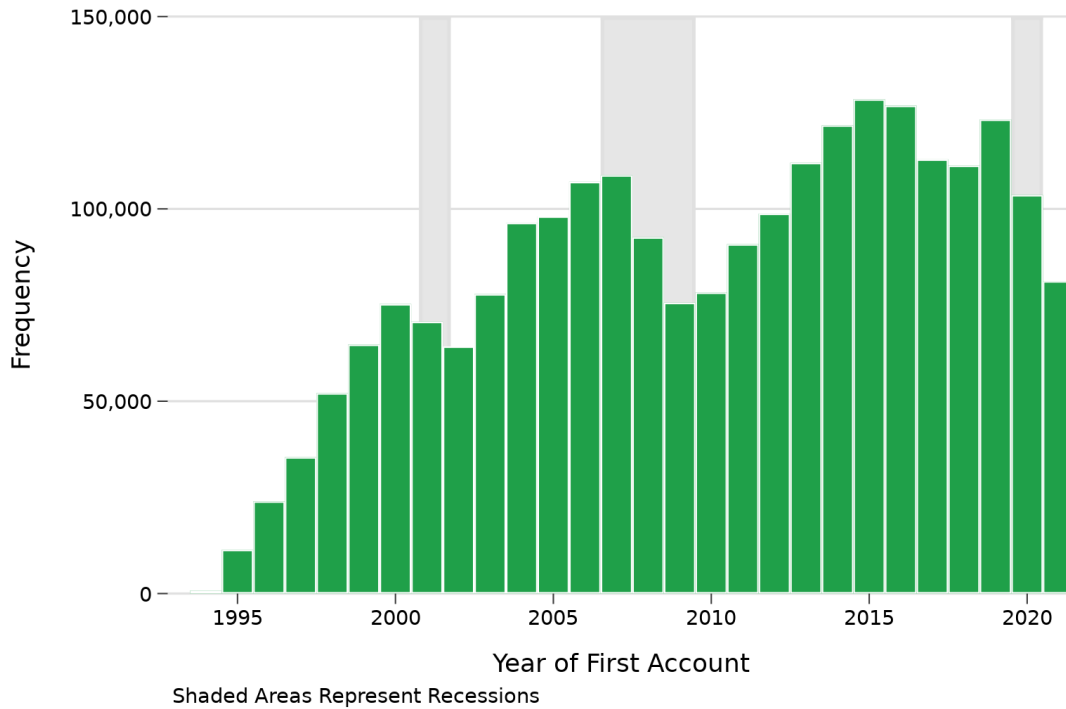


Figure 1: Distribution of Year of Entry Across Sample of Credit Market Entrants in the CFPB Consumer Credit Panel

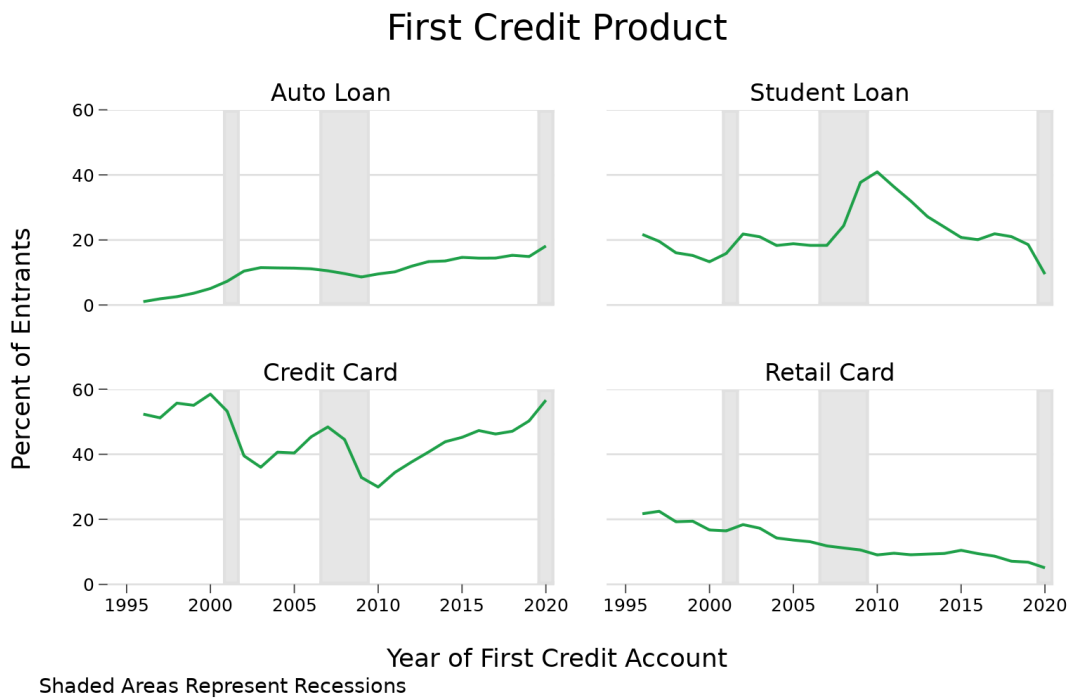


Figure 2: Share of Consumers Entering with Common First Credit Products, by Entry Product and Year of Entry

A Additional Tables and Figures

Table A1: Effect of Initial Unemployment Rate on Credit Later in Life For Sub-Groups of Entrants

t	Enter Age 21+	Likely Students	Likely Non-Students	Enter w/AU	Enter w/Collection
<i>Outcome: Any Student Loan</i>					
2	0.020*** (0.0024)	0.0028 (0.0018)		0.019*** (0.0040)	0.060*** (0.0093)
4	0.019*** (0.0025)	0.0022 (0.0019)	0.000050 (0.00035)	0.016*** (0.0038)	0.050*** (0.010)
6	0.015*** (0.0026)	0.00078 (0.0023)	-0.00018 (0.00098)	0.0099* (0.0039)	0.034** (0.012)
8	0.010*** (0.0026)	-0.0014 (0.0025)	-0.0026 (0.0014)	0.0049 (0.0039)	0.013 (0.011)
10	0.0067** (0.0024)	-0.0033 (0.0026)	-0.0028 (0.0016)	0.0017 (0.0037)	0.0078 (0.0095)
<i>Outcome: Any Auto Loan</i>					
2	-0.0068* (0.0027)	-0.0043 (0.0026)	-0.0029 (0.0026)	-0.011** (0.0033)	-0.0033 (0.0088)
4	-0.0032 (0.0028)	-0.0019 (0.0027)	-0.0055* (0.0025)	-0.0068 (0.0036)	0.0057 (0.0097)
6	0.00079 (0.0030)	0.0019 (0.0028)	0.0049 (0.0026)	0.0069 (0.0037)	0.038*** (0.012)
8	0.0088** (0.0030)	0.0032 (0.0029)	0.0080** (0.0025)	0.014*** (0.0038)	0.047*** (0.011)
10	0.0088** (0.0029)	0.0074** (0.0028)	0.0062* (0.0024)	0.0056 (0.0037)	0.021* (0.0095)
<i>Outcome: Total CC Limit</i>					
2	-34.6 (70.8)	42.7 (34.7)	53.5* (26.4)	-94.4 (66.8)	-20.0 (73.0)
4	-19.1 (76.0)	-38.2 (50.9)	127.1** (39.1)	-36.0 (88.2)	171.9 (120.0)
6	-181.8 (97.9)	-146.8 (75.1)	201.0** (63.1)	-119.0 (117.6)	129.4 (184.1)
8	-185.8 (120.5)	-165.5 (96.3)	229.5** (81.1)	-259.9 (146.1)	162.3 (234.7)
10	36.7 (125.2)	121.4 (107.5)	261.5** (84.6)	-110.1 (166.2)	-63.0 (279.5)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Each cell is the coefficient on initial unemployment rate from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. All columns instrument for the unemployment rate at entry with the unemployment rate at age 18, or at age 21 for columns 2 and 3. Standard errors clustered by county-entry year interactions reported in parentheses.

Table A2: Effect of Initial Unemployment Rate on Credit Held Later in Life

Years Since Entry	Any Student Loan		Any Auto Loan		Total CC Limit	
	OLS	IV	OLS	IV	OLS	IV
2	-0.0037*** (0.00066)	0.030*** (0.0013)	0.0043*** (0.00045)	-0.010*** (0.0012)	-32.9*** (7.11)	-52.5 (34.7)
4	-0.018*** (0.00072)	0.021*** (0.0013)	-0.0012** (0.00046)	-0.010*** (0.0013)	18.1 (13.2)	-213.0*** (27.5)
6	-0.017*** (0.00073)	0.019*** (0.0014)	0.00067 (0.00046)	0.00040 (0.0015)	171.1*** (19.6)	-403.0*** (39.0)
8	-0.013*** (0.00072)	0.023*** (0.0014)	-0.00053 (0.00043)	0.0100*** (0.0015)	289.6*** (23.8)	-356.2*** (48.3)
10	-0.020*** (0.00073)	0.012*** (0.0013)	-0.0038*** (0.00036)	0.0067*** (0.0014)	445.8*** (24.9)	-41.3 (50.9)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Each cell is the coefficient on unemployment rate in the year a consumer enters the credit market from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. IV columns instrument for the unemployment rate at entry with the unemployment rate at age 18. Standard errors clustered by county-entry year interactions reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A3: Effect of Initial Unemployment Rate on Credit Held Later in Life

Years Since Entry	Any Student Loan	Any Auto Loan	Total CC Limit
2	0.089*** (0.0042)	-0.029*** (0.0039)	-226.8* (113.9)
4	0.084*** (0.0054)	-0.029*** (0.0054)	-595.4*** (110.5)
6	0.062*** (0.0064)	0.0081 (0.0066)	-877.4*** (175.3)
8	0.038*** (0.0056)	0.016** (0.0059)	-786.4*** (191.1)
10	0.023*** (0.0051)	0.0092 (0.0053)	-499.7* (198.7)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Each cell is the coefficient on unemployment rate in the year a consumer enters the credit market from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. All columns instrument for the unemployment rate at entry with the unemployment rate at age 16. Standard errors clustered by county-entry year interactions reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A4: Effect of Initial Unemployment Rate on Credit Scores Later In Life (Instrument is Unemployment at 16)

Years Since Entry	Credit Score	Probability Scored
2	5.26*** (1.40)	0.0048* (0.0020)
4	1.16 (1.09)	0.011*** (0.0026)
6	-0.17 (1.30)	0.0080** (0.0031)
8	1.22 (1.16)	0.0022 (0.0028)
10	3.10** (1.04)	0.0027 (0.0025)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Each cell is the coefficient on unemployment rate in the year a consumer enters the credit market from a separate regression. The unit of observation is a consumer, observed 2, 4, 6, 8 or 10 years after acquiring a credit account. Sample is limited to consumers who entered the credit market between 2000 and 2011. IV columns instrument for the unemployment rate at entry with the unemployment rate at age 16. Standard errors clustered by county-entry year interactions reported in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B Discussion of additional results

B.1 Subsample analysis of initial conditions on credit outcomes

We examine whether the overall effects of unemployment at entry are stronger in certain subgroups. Table A1 repeats the IV specifications from Table A3 for several subsamples of entrants. Each cell contains the coefficient on initial unemployment from a separate regression for outcomes 2, 4, 6, 8, or 10 years after entry. The top panel shows results for the probability of having a student loan, the middle panel shows results for the probability of having an auto loan, and the bottom panel shows results for total credit card limit. Each column contains results for a different sub-sample. The first column shows results limited to consumers who entered at age 21 or older, to focus on later entrants. We find largely similar point estimates in this group as for the full sample. The second column shows results for consumers who we can identify as likely having attended college (and thus delayed entering the labor market, defined as having a student loan opened before age 24. This definition is under-inclusive, as individuals may attend college without acquiring student loans. For this subgroup we designate their time of entry as the year of their first non-student loan account. For likely students, initial unemployment has limited effects on having a student loan after entering, but we do not observe any clear pattern in the effect on having an auto loan or credit card limit. Conversely, we can also focus on consumers who likely did not attend college. We identify these consumers as those who did not have a student loan before age 24, but did have a non-authorized user, non-student installment loan before age 22. All types of installment credit generally require proof of income to originate a loan without a co-signer, so these individuals likely entered the labor market rather than going to college. For likely non-students we find the effect of initial unemployment on having an auto loan is similar to the full sample, but we get notably different impacts on credit card limits. Likely non-students have significantly higher credit card limits if unemployment was higher when they entered the credit market. Finally, the fourth column limits attention to

consumers who had an authorized user account prior to entering the credit market, and the fifth column limits attention to consumers who had a collection tradeline prior to entering the credit market. The patterns for these groups are similar to the full sample, although the magnitudes of the impact of initial unemployment on the the probability of having auto loans and student loans is greater (more positive) for consumers who had a collection on their credit records prior to entering the credit market.

B.2 Analysis of Credit Scores with no Year of Entry Fixed Effect