Credit Cards, Race, and Entrepreneurship*

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PRELIMINARY

Abstract: We use the decision by 14 states to remove credit card interest rate caps after the U.S. Supreme Court's 1978 *Marquette* decision as a natural experiment to explore the impact of credit card availability on black entrepreneurship, which we contrast to the impact of bank branching deregulation. We use Current Population Survey data from 1971-1985 to show that removing state-level credit card interest rate caps increased transitions into self-employment among black individuals. There was no corresponding increase for black individuals following bank branching deregulation. We provide additional evidence that the impact was larger in states with a history of discrimination. Our findings suggest that credit cards were a mechanism that black entrepreneurs used to overcome financial barriers to entry due to discrimination in lending.

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I. Introduction

Prior research shows that financial deregulation leads to competition among lenders which benefits borrowers, and ultimately leads to increased entrepreneurial activity (Sandra Black and Philip Strahan, 2002; Nicola Cetorelli and Philip E. Strahan, 2006; William Kerr and Ramana Nanda, 2009). Do all entrepreneurs benefit from financial deregulation? Prior research shows that black entrepreneurs have a harder time obtaining financing than white entrepreneurs (David G. Blanchflower, Phillip B. Levine and David J. Zimmerman, 2003). This difficultly appears to be driven in part by racial discrimination when applying for loans (Robert Fairlie and Alicia Robb, 2008). Hence, while financial deregulation may benefit the average entrepreneur, this average may mask considerable heterogeneity across types of entrepreneurs. In this paper, we seek to understand the relative importance of credit card financing to black and white entrepreneurs. We focus on credit cards for two reasons. First, despite a plethora of anecdotal evidence about the importance of credit cards in entrepreneurial finance, the role credit cards play is still not well understood. Second, there is some evidence that black entrepreneurs are more likely to finance their ventures using credit cards than white entrepreneurs, which may be due to differences in access to credit cards versus traditional bank loans (Robert Fairlie and Alicia Robb, 2008).

The paper investigates changes in self employment transition rates following a state's switch to a policy of no limit on credit card interest rates; we refer to these policies as "no limit" in much of the following. As described in more detail below, these state level policy changes occurred in the years following the US Supreme Court's *Marquette* decision. We find evidence that a state's switch to no limit increased the probability of both white and black transitions into self employment, with a particularly strong effect on black transitions. Our results suggest that

living in a no limit state resulted in a 30% increase in the probability of white transitions into self employment and a 80% increase in the probability of a black transitions into self employment. We augment the main results by showing that white and black individuals were not any more likely to exit self employment following credit card deregulation. We take this as evidence that entrepreneurs in no limit states were not engaged in comparatively riskier projects which in turn were more likely to be funded after credit card deregulation. This result contrasts a finding by other authors that financial deregulation led to more business churn (Kerr and Nanda, 2009).

We also perform a number of robustness checks, including a comparison to bank deregulation. We analyze the role of bank loans in entrepreneurial finance by investigating changes in self employment transition rates following a state's adoption of intrastate or interstate banking deregulation, an approach that follows studies presented in Black and Strahan (2002) and Kerr and Nanda (2009). Intrastate bank branching deregulation allowed banks to expand into neighboring states whereas interstate deregulations allowed banks to acquire branches in other states, provided the states had negotiated a bilateral agreement (Randall Krosner and Philip Strahan, 1999). Prior studies show that bank branching deregulation led to an increase in entrepreneurial activity. We can partially replicate this finding, but interestingly black entrepreneurs do not seem to benefit from bank deregulation as much as white entrepreneurs. Finally, we show that black self employment transitions increased more in areas with higher levels of discrimination. As we argue in the conclusion, we believe these results provide evidence consistent with a scenario in which black entrepreneurs faced discrimination through standard bank lending channels, but that credit cards were an important mechanism that black entrepreneurs used to overcome discrimination based barriers to finance.

Our work builds upon several streams of literature. Prior work has found that blacks generally enter entrepreneurship at lower rates than whites (Robert W. Fairlie, 1999). Several explanations have been offered to explain this disparity, including family structure (Michael Hout and Harvey S. Rosen, 2000), liquidity constraints, and consumer discrimination (Bruce D. Meyer, 1990). Even after becoming entrepreneurs, black individuals face more challenges in running a successful business. Alicia M. Robb, Robert W. Fairlie and David T. Robinson (2009) show that black entrepreneurs have more trouble accessing external capital markets, and rely more heavily on owner financing. Blanchflower, Levine and Zimmerman (2003) find that black-owned small businesses are more likely to be denied bank credit than other groups,[1] and when they do obtain credit, they pay higher interest rates. Other work (George J. Borjas and Stephen G. Bronars, 1989; Meyer, 1990; Daiji Kawaguchi, 2005) has suggested that consumer discrimination may decrease returns for black entrepreneurs. Studies of online lending markets (Enrichetta Ravina, 2008; Devin G. Pope and Justin R. Sydnor, 2010), in which lenders can observe characteristics such as race, show that black borrowers are less likely to obtain loans as white borrowers in some cases, and that black borrowers pay significantly higher interest rates than white borrowers. We build on this literature by showing that black individuals are more likely than whites to use credit cards to finance entrepreneurial entry, and by arguing that credit cards are a mechanism for overcoming racial discrimination in lending.

We add to the literature on credit card and other alternative lending sources. Several studies by Victor Stango and coauthors document the competitive interaction between credit card companies (Victor Stango, 2002; Victor Stango 2003; Chris Knittel and Victor Stango, 2003).

[1] In an appendix, we replicate this result using data on black borrowers in the 1970s and 1980s. We show that black borrowers are systematically more likely than white borrowers to be turned down or are afraid to be turned down by lenders, even after controlling for relevant demographic characteristics.

Jonathan Zinman (2002) uses the *Marquette* decision to study changes in consumer use of credit cards with data from the Federal Reserve Board's Survey of Consumer Finance (SCF). Zinman shows that individuals are more likely to have a credit card post-*Marquette*. To the best of our knowledge, the only other study on the role of credit card and entrepreneurial finance is Robert Scott (2010) which uses Kauffman Firm Survey data to document that a number of entrepreneurs use credit cards to start companies. Other researchers have studied the role of alternative, and potentially usurious, lending sources. Adair Morse (2009) finds that access to payday loans helps alleviate unanticipated financial distress. Efraim Benmelech and Tobias Moskowitz (2010) study historical interest rates in the US and find that tighter interest rate caps lower economic activity, particularly for small firms.

We directly build upon a body of research that studies the effect of bank deregulation. Black and Strahan (2002), Cetorelli and Strahan (2006), and Kerr and Nanda (2009) all find that bank deregulation increases entrepreneurial entry. The increased entry appears to increase churn, as many of the new entrants exit a few periods after entry (Kerr and Nanda, 2009). We account for these bank deregulations in our study, and also study the differential effect these bank deregulations had on black entrepreneurs. Ross Levine, Alexey Levkov and Yona Rubinstein (2008) study the effect of bank deregulation on black wage earners. They show that bank deregulations indirectly led to a decrease in the black-white wage gap by helping to increase firm entry, thereby increasing competition for wage earners. Moreover, they find that the effect is larger in states with comparatively higher discrimination. Our study focuses instead on the direct effect that credit card deregulation had on black entrepreneurial entry. Similar to Levine et al (2008), we find a larger effect in states with comparatively higher discrimination, across several measures of discrimination.

Our study is also broadly related to studies on the role of liquidity constraints in entrepreneurial finance. While several prior academic studies have explored the importance of liquidity constraints for entrepreneurs, they yield contradictory results. For example, David G. Blanchflower and Andrew J. Oswald (1998), Robert Fairlie (1999), Thomas Lindh and Henry Ohlsson (1996), and Ramana Nanda (2009) all demonstrate that wealth constraints hinder entrepreneurship and that shocks that remove these constraints lead to higher entrepreneurship. Erik Hurst and Annamaria Lusardi (2004) and Mitchell A. Peterson and Rajan G. Raghuram, (2002), on the other hand, argue that wealth constraints are likely small. In particular, Hurst and Lusardi (2004) find that the probability of entering self employment is broadly similar across most of the wealth distribution. The removal of credit card interest rates that we study are shocks that should remove liquidity constraints. We contribute to this literature by showing that entrepreneurs are differentially affected by shocks to liquidity constraints.

In the next section, we describe the *Marquette* decision. Section III describes our methods and data. Section IV describes the main results: that white and black individuals were more likely to transition into self-employment if they resided in a state that eliminated its credit card interest rate cap. Section IV also provides robustness tests, additional results showing that black individuals were less likely to exit self employment for unemployment following a state's switch to no limit, and results showing how discrimination affected self employment transition rates. Section V concludes and discusses the implications of our analysis.

II. The Marquette Decision

In December 1978, the Supreme Court considered the case of *Marquette National Bank of Minneapolis v. First Omaha Service Corp*. The case centered around First Omaha's marketing

of credit cards to Minnesota customers. During this period, states were allowed to set their own caps on credit card interest rates, so First Omaha was charging a higher rate, as allowed by Nebraska law, than Minnesota-based banks could offer to customers in their own state. As a result, the Minnesota attorney general contended that these activities interfered with the state's ability to enforce its usury laws (Diane Ellis, 1998). The Court ruled that the National Bank Act stipulated that banks could charge the highest allowable rate in their home state, regardless of the interest rate cap in the customer's state of residence (Lawrence M. Ausubel, 1997; Ellis, 1998).

Starting in 1980, and particularly in 1981, a number of states removed credit card interest rate caps (see Figure 1; New Hampshire was the one state that had no cap for the entire period). Note that the removal of interest rate caps did not immediately follow the Supreme Court ruling in December 1978, but instead occurred over a four year period from 1980 – 1983. According to some accounts, states removed interest rate caps in an attempt to attract and retain banks, and major banks like Citibank moved to high rate or no limit states such as South Dakota (Ausubel, 1997; Ellis, 1998). However, despite Citibank's high profile move to South Dakota, there was not an immediate migration to no limit states because of legal restrictions on interstate banking. Many of these restrictions remained in place until the mid-1980s (Randall S. Kroszner and Philip E. Strahan, 1999). As a result, there was not an immediate saturation of interstate credit cards marketed from banks in no limit states to individuals in states with limits. Instead, individuals living in states that eliminated interest rate caps were immediately affected, but not individuals residing in states with limits. Christopher R. Knittel and Victor Stango (2003) report that, as of 1984, only 8 – 9% of customers held out-of-state bank cards.

Existing data and prior empirical work confirm that state-level changes in credit card interest rates increased the supply of credit cards. Using data from the Survey of Consumer

Finances (SCF), Zinman (2002) shows that credit card ownership increased more in no limit states. According to our own analysis of the SCF presented in Table 1, by 1983 72 percent of individuals living in limit states owned a credit card compared to 77 percent of individuals living in no-limit states. In addition, data on the state-level HHI of credit card companies shows that HHI levels were lower in states with no limit on credit card interest rates. While this result is not statistically significant, it suggests that there was a greater supply of credit cards in no limit states. Moreover, it seems the distribution of the financing provided by credit cards shifted to include higher interest rate borrowers (W. F. Baxter, 1985; Ellis, 1998). Our own analysis of the SCF shows that individuals living in states with no limit on the allowable interest rate paid a statistically significantly greater APR on their outstanding balances. Hence, the existing data show that a state's switch to no limit increased the supply of credit cards to individuals living in the state. Our empirical design takes advantage of this shock to examine the role of credit cards for black and white entrepreneurs.

III. Empirical Strategy and Data

A. Empirical Strategy

We hypothesize that access to credit cards is an important determinant of entrepreneurial activity. Our prediction is that the removal of state level credit card interest rate caps following the *Marquette* decision lead to increased entrepreneurship, and that the effect was especially pronounced among blacks. We treat these state-level changes in maximum allowable credit card interest rates as exogenous and use them to proxy for changes in the availability of credit card financing. We focus on transitions into self employment as a measure of entrepreneurial activity. Accordingly, the main specification is:

$$(1)\ y^*_{imt} = \alpha + \beta_1 Nolimit_{mt} + \beta_2 Nolimit_{mt} * black_{imt} + \delta_m + T_t + Trend * \delta_m + \mathbf{X_{imt}}\boldsymbol{\beta} + e_{imt}$$

where y^*_{imt} is the probability of individual *i* living in market *m* transitioning from a full time job to full time self employment at time *t*. When $y^*_{imt} > 0$, we observe $y_{imt} = 1$ indicating that the individual has transitioned to self employment, and when $y^*_{imt} < 0$, the individual has not transitioned. $Nolimit_{mt}$ is an indicator for *no limit* on credit card interest rates. We include market (λ_m) and year (T_t) effects. Market is defined at the metropolitan-state level. For example, the boundary of the Philadelphia PA/NJ metro area crosses into two states, and so is divided into two mutually exclusive areas: Philadelphia PA and Philadelphia NJ. In addition, areas in each state not part of a metro area are grouped into a statewide non-metro area. To allow for different trends across market areas we include an interaction between a time trend and the market fixed effect $Trend*\delta_m$, an approach that follows Timothy Besley and Robin Burgess (2004) and Justin Wolfers (2006). $\mathbf{X}_{imt}$ is a vector of individual characteristics (including a dummy for *black*) and industry dummies. Throughout all of our specifications the error terms e_{imt} are clustered at the state level to account for autocorrelation in the data across individuals.[2] This clustering relaxes the assumption of independence of the error terms of individuals that live in close proximity to one another, and insures that the standard errors are not underestimated (Marianne Bertrand, Esther Duflo and Sendhil Mullainathan, 2007). We are particular interested in the coefficients β_1 and β_2. We expect that a state's switch to no limit results in increased probability of transition

[2] We follow Arellano (1987) by clustering at a level above the market fixed effect, but results are robust to clustering at the market level.

into self employment in the population, with a particularly strong effect for black individuals. That is, we expect both β_1 and β_2 to be positive.

One explanation for higher transitions into self employment is that individuals are using easier access to credit to fund risky projects. If so, there should be evidence that individuals living in no limit states are more likely to transition out of self employment into unemployment or another wage paying job. We test for this possibility using the following specification:

$$(2)\ w^*_{imt} = \alpha + \gamma_1 Nolimit_{mt} + \gamma_2 Nolimit_{mt} * black_{imt} + \delta_m + T_t + Trend * \delta_m + \mathbf{X_{imt}}\boldsymbol{\gamma} + e_{imt}$$

where w^*_{imt} is the probability of individual *i* living in market *m* transitioning from full time self employment to unemployment or another wage paying job at time *t* and the other variables are as described in (1) above. Positive coefficients γ_1 and γ_2 would indicate an increase in churn.

Finally, in order to test the role of credit cards as a mechanism to address discrimination based barriers to entry, we categorize states along different measures of discrimination and compare β_2 across these state types. That is, we run equation (1) separately for different groups of states, and then compare the resulting coefficients β_2 using χ^2 tests.

B. Description of Data

Data on the interest rate cap for each state during our sample period was hand-collected from annual volumes of *The Cost of Personal Borrowing in the United States* to create a variable *no limit* which equals one for all years when the state has no limit on credit card interest rates, and zero otherwise. Figure 1 shows that the number of states with no limits increased from one to fourteen in the years following the *Marquette* decision. Information on banking deregulation is

from Kroszner and Strahan (1999). The variable *intrastate banking deregulation* equals one for all years that the state has implemented intrastate banking deregulation reforms and zero otherwise; the variable *interstate banking deregulation* equals one for all years that the state has implemented interstate banking deregulation reforms and zero otherwise. Table 2 lists the date when the state passed each type of deregulation.

We use Current Population Survey (CPS) data from 1971-1975, 1977-1981, and 1983-1985[3] to establish the link between changes in availability of credit card financing and self-employment rates. The CPS is ideal for this analysis because it includes many variables that we use to control for alternative explanations. We restrict our observations to individuals who are white or black, who are between ages 18 and 65, who work full time, and who do not work for the military or on a farm. Consistent with other work in this area (Fairlie, 1999), *transition into self-employment* is our dependent variable in all regressions. Self-employment is commonly used to identify entrepreneurs, and is the best variable we have given the nature of the CPS data.[4] We identify transitions into self-employment by restricting the sample to individuals who were employed full time in a wage-paying job in the prior year. Figure 2 uses the sample data to plot self employment transition rates by no limit and limit states, the difference between these rates, and a 95% confidence interval around this difference.

We also collect a number of individual characteristics that previous studies have shown are important predictors of self-employment. These variables include indicators for *black*, *female*, *married*, *home owner*, *urban*, *high school graduate* and *household income* as well as

[3] CPS does not have data for 1976 and 1982.

[4] It would be interesting to distinguish between self-employed individuals who work in a single-person firm and self-employed individuals who employ others. Nanda (2009) has a dataset that allows him to perform such a study, but we are unaware of any U.S. dataset that pre-dates the *Marquette* decision.

continuous variables for *age* and its square.[5] We also construct demographic variables by market for *unemployment rate* and *percent of population living in a rural area*. 145 industry dummies are included to control for differences in self employment transition rates across industry. Self employment transitions may vary by industry based on different financing needs across industries. For example, according to the Federal Reserve Board's 1987 National Survey of Small Business Finance, the median starting capital in the construction industry was $9,500, whereas the median starting capital in retail trade was $55,200.[6] Year dummies are included to control for macroeconomic fluctuation that affect the employment opportunity set faced by each individual. Market fixed effects are included to control for differences in employment opportunities, local regulations regarding business start up costs and other entry barriers across geographical regions. The CPS data includes weights, and the main results are robust to the use of these weights. However, similar to the approach taken in Manju Puri and David T. Robinson (2009), we do not use weights in any of the reported results because our intent is to measure the effect of changes in availability of finance type on an *individual's* decision to become an entrepreneur.

Table 3 presents summary statistics and a comparison of variable means between states that switched to *no limit* regulation during the sample time frame and those that did not. The comparison uses data from 1977 as that was the first year in which the CPS provided data from all 50 states and the District of Columbia. In addition, 1977 is the year prior to the *Marquette* decision. Although our research design treats the state's switch to *no limit* as exogenous, the statistics reported in Table 3 reveal that the observed demographic variables do not appear to be

[5] The results are robust to the exclusion of *homeowner* and *income*, the two variables that are most at risk of being endogenous to the self-employment decision.
[6] NSSBF statistics cited in Hurst and Lusardi (2004). 1987 is the earliest data for the NSSBF data.

randomly distributed across the two types of states. In particular, no limit states appear to have significantly fewer black individuals and younger individuals than states with limits. We address this issue in robustness tests that restrict the analysis to only states that ever experience a switch to no limit.

IV. Results

A. Main Results

Results of OLS regressions are reported in all tables; coefficients of control variables are suppressed for presentation purposes. Table 4 presents the results of the basic model. This model investigates the effects of the availability of finance type on transitions into self employment from a wage paying job using data from the CPS for 1971-1985. Column (1) replicates the model presented in equation (1), omitting the interaction between *black* and *no limit*. The coefficient on *no limit* in Column (1) is positive and significant. Column (2) includes the interaction term; the coefficients on *no limit* and black**no limit* are both positive and significant. As reported in Table 3, the means of demographic variables differed across states types. The systematic difference in these variables shows that the passage of "no limit" laws was not a random event which suggests that states which do not switch to no limit may be a poor control group. Column (3) presents results from the basic model on the subset of 14 states that passed a no limit law from 1971-1985; that is, we investigate the effect of the treatment of switching to no limit on individuals living in states that received the treatment from 1971-1985. The counterfactual in this exercise comes from trends in other states which have not yet switched to no limit, instead of from all other states, regardless of whether they switch to no limit or not. Arguably, the subset of states which ever switch to no limit (during the sample time frame) is a

better control group than the entire population of states. The coefficients on *no limit* and black**no limit* remain positive and of similar magnitude, but only the coefficient on the interaction term is statistically significant. The results in Table 4 indicate that black individuals who resided in a state with no limit on credit card rates and who were employed full time at *t-1* were significantly more likely to enter self-employment by time *t*. The evidence is less strong in the case of white individuals, but nevertheless strongly suggestive of the idea that white individuals who resided in a state with no limit on credit card rates and who were employed full time at *t-1* were more likely to enter self-employment by time *t*. The coefficient on no limit in Column (2) is 0.0024; we compare this coefficient to the mean self employment transition rate of 0.0081 to estimate that self employment transition rates were approximately 30% higher for black individuals living in *no limit* states. The coefficient on *black*no limit* in Column (2) is 0.0068; we compare this coefficient to the mean self employment transition rate to estimate that self employment transition rates were approximately 84% higher for black individuals living in *no limit* states.

B. Robustness Checks

Table 5 presents results from several robustness checks. For comparison, results from the basic model (Column (2) from Table 4) are presented in Column (1) of Table 5. The basic model includes only the interaction between *black* and *no limit*; one worry is that the interaction is capturing unobserved interactions between *no limit* and other indicators for low socio-economic status that are correlated with *black*. In order to address this possibility, Column (2) includes interactions between *no limit* and all the individual characteristics. The coefficient on *black*nolimit* remains positive and statistically significant, although the coefficient drops from

0.0068 to 0.0060, suggesting that some of the main effect is due to the correlation between *black* and other low socio-economic indicators. The interactions are not reported for space reasons, but it is worth noting that the coefficients on the interactions between female and no limit and age and no limit are positive and statistically significant, indicating that female and older individuals who lived in states with no limit on credit card interest rates were more likely to transition into self employment.

Other researchers have argued that black entrepreneurs have more difficulty obtaining loans to finance their ventures (Blachflower et al, 2002; Fairlie and Robb, 2008; Ravina, 2008), a finding we replicate in an appendix. Faced with such barriers to entry, black entrepreneurs may instead prefer to enter certain industries that have lower capital requirements. Equation (1) includes industry dummies to control for the different capital requirements across industries, which may affect the decision to start a business in that industry. Column (3) replicates the model in Column (1) but includes interactions between *black* and the industry dummies to control for the possibility that black individuals may be more likely to work in certain industries, perhaps due to different skills, preferences or access to start up capital. Column (3) also includes interactions between *black* and other demographic characteristics. The coefficient on *black*nolimit* remains positive and significant.

As reported in Hurst and Lusardi (2004), the median starting capital requirements vary across industry. It seems unlikely that an individual could use a credit card to finance entry into an industry with a high starting capital requirement. Columns (4) – (6) investigate this idea. Column (4) includes interactions between *nolimit* and industry dummies. The coefficient on *black*nolimit* remains positive and significant. To better understand effects of industry starting capital requirements, in Columns (5) and (6) we split the data into two subsamples: low starting

capital industry and high starting capital industry. We use the median starting capital figures cited in Hurst and Lusardi (2004) to determine the starting capital for each of eight broad industry categories, and then assign individuals to the low category if the industry in which the individual works is one of the four lower median starting capital industries, or to the high category if otherwise.[7] The coefficient on *nolimit* is insignificant in both models. The coefficient on *black*nolimit* is 0.0095 for low capital industries and 0.0048 for high capital industries, significant at the 10% level in both cases. The point estimates are consistent with the expectation that credit card deregulation will have a larger effect on entry into industries with low starting capital, but the difference between these coefficients is not significant.

Table 6 reports the results of robustness checks using information on state banking deregulations. Other research (Black and Strahan, 2002; Kerr and Nanda, 2009) has shown that banking deregulation led to an increase in entrepreneurial activity. Banking deregulation was contemporaneous to credit card deregulation, and so presents a potential confounding effect that could explain the results shown thus far. In order to address this possibility, we include indicators for *intrastate banking deregulation*, *interstate banking deregulation* and interactions between these variables and *black*. Column (1) replicates Column (1) of Table 4, but with the bank deregulation indicators. The coefficient on *nolimit* is positive and significant. The coefficient on *interstate banking deregulation* is positive, suggesting that interstate banking deregulation increased transitions into self employment, a result consistent with that found by other researchers. However, the coefficient is not significant at standard levels. The coefficient on *intrastate banking deregulation* is negative and insignificant. In Column (2) we add in the

[7] Industries with low starting capital requirements are construction, services, insurance and real estate, and mining. Industries with high starting capital requirements are wholesale trade, manufacturing, transportation, communications and public utilities, and retail trade. See Hurst and Lusardi (2004) for more detail.

interaction *black*nolimit*, which is positive and significant as in Column (2) of Table 4. In Column (3) we add in interactions between *black* and the bank deregulation indicators. While neither are significant, it is interesting to note that the coefficient on *black*interstate banking deregulation* is negative, providing suggestive evidence that bank deregulation increased entrepreneurial activity for white individuals but not for black individuals.

C. Performance of Self-Employed Ventures

The foregoing results show that individuals, particularly black individuals, living in states that switched to no limit on credit card interest rates were more likely to enter self employment. As shown in Table 1, individuals who lived in states with no limit on credit card interest rates paid a higher APR. Hence, one explanation for increased entry into self employment is that entrepreneurs in no limit states were engaged in higher risk projects; once the cap on interest rates was removed, credit card companies were more likely to market credit cards to these individuals, and match the APR on the credit card to the perceived riskiness of the entrepreneur (or his or her project). If it were the case that entrepreneurs in no limit states were systematically more likely to engage in higher risk projects, then on average those projects would be more likely to fail. Hence, we should see that, even though individuals were more likely to enter self employment in states that switched to no limit, those individuals were also more likely to fail at their new venture.

In Table 7, we explore this idea by investigating transitions out of full time self employment. Columns (1) and (2) focus on transitions from self employment into unemployment. We focus on this transition as a way to measure the probability of an entrepreneurial venture failing. Column (1) replicates the model presented in equation (2),

omitting the interaction between *black* and *no limit*. The coefficient on *no limit* in Column (1) is not significant. Column (2) includes the interaction term; the coefficients on *no limit* and *black*no limit* are both negative, and significant in the case of *black*no limit*. Hence, there is no evidence that white or black individuals were more likely to transition from self employment into unemployment; if anything, black individuals were even less likely to make this transition. For comparison, we also examine transitions into full time and part time wage earning jobs in Columns (3) – (6). The coefficients on *black*no limit* are negative across these columns, but not significant. The coefficients on *nolimit* are positive but not significant in Columns (3) and (4) and negative and significant in Columns (5) and (6). To the extent that these transitions out of self employment are a decent measure of entrepreneurial failure, then the results suggest that credit card deregulation did little to change the probability of entrepreneurial success. Hence, there is little evidence to support the idea that entrepreneurs in no limit states were systematically engaged in higher risk activities.

D. The Role of Discrimination

In order to understand the role of discrimination in access to credit, we investigate whether the impact of *no limit* differentially affects black individuals in states with a history of discrimination. To do this, we rely on institutional and legal histories for each state. As other research has argued, initial conditions of institutions and norms in an area can explain variation across areas in later periods (Daron Acemoglu, Simon Johnson and James A. Robinson, 2001). We first focus on historical state characteristics by identifying states which allowed slavery at the start of the Civil War (*slave state*). We next focus on more recent state characteristics contemporaneous to the *Marquette* decision. We identify states which were among the last to

remove anti-miscegenation laws (*anti-miscegenation law state*). We obtain information on the states which repealed anti-miscegenation laws only after the U.S. Supreme Court's 1967 decision in *Loving v. Virginia* from Roland G. Fryer (2007). We also identify states which did not have fair housing laws (*no fair housing law state*) until the federal Fair Housing Act of 1968 from William J. Collins (2004). Finally, we use the racial bias index reported in Levine, Levkov and Rubinstein (2008), which measures the difference between actual and predicted interracial marriage rates, to classify states as above or below the median interracial marriage bias (*interracial marriage bias state*).

Table 8 replicates the model in Column (2) of Table 4, and splits the results by state type. Column (1) focuses on states that were not slave states immediately prior to the Civil War; the coefficient on *black*no limit* is 0.0018 and is not significant. Column (2) focuses on states that were slave states immediately prior to the Civil War; the coefficient on *black*no limit* is 0.0129 and significant at the 1 percent level. The results in these two columns suggest that black individuals residing in former slave states were more likely to transition into self-employment following an increase in credit availability than were black individuals in non-slave states. A χ^2 test rejects the null hypothesis that the coefficients on *black*no limit* are the same across the two samples at the 6 percent level. Columns (3) and (4) present results from splitting the sample into states with and without anti-miscegenation laws in 1967; Columns (5) and (6) present results from splitting the sample into states with and without fair housing laws in 1968; and Columns (7) and (8) present results from splitting the sample into states with low or high interracial bias. We find similar results across all four of these measures for discrimination: black individuals residing in states with higher levels of discrimination were more likely to transition into self-employment following an increase in credit card availability. We can reject the null hypotheses

that the coefficients for *black*no limit* are the same across the two samples for the *anti-miscegenation law state* measure (at the 5 percent level), and for the *no fair housing law state* measure (at the 1 percent level). However, we cannot reject the null hypotheses that the coefficients for *black*no limit* are the same across the two samples for the *interracial marriage bias state* measure.

V. Discussion and Conclusion

Our study considers the importance of different types of finance to different types of entrepreneurs. We take advantage of state level variation in credit card interest rate caps following the Supreme Courts 1978 *Marquette* decision to study the role played by credit cards in entrepreneurial finance. We show that eliminating caps increased black and white transitions into self-employment; the result is particularly strong for black transitions. We show that neither white nor black individuals were less likely to transition from self employment to unemployment following elimination of the caps. We contrast the results to the effect of contemporaneous bank deregulation, which increased white but not black transitions into self employment. Furthermore, we show that black individuals in states with a history of racial discrimination were more likely to enter self-employment after caps were eliminated. We believe these findings have two implications: first, credit cards are an important means of entrepreneurial finance and, second, black individuals faced discrimination-based barriers to entrepreneurship in the 1970s and 1980s and used credit cards as a mechanism to overcome those barriers.

Several of our results contrast results provided by other researchers. First, we provide evidence that self employed individuals are less likely to transition to unemployment or another wage paying job if residing in a state with no limit on credit card interest rates; that is, credit card

deregulation does not appear to increase new business churn. In contrast, new business churn appears to have increased following bank deregulations (Kerr and Nanda, 2009). One explanation for this result is that entrepreneurs financing their businesses with credit cards are primarily financing low capital businesses, an explanation consistent with some of the results supplied in our robustness tests. Second, whereas credit card deregulation had a positive effect on both white and black transitions into self employment, bank deregulations an asymmetric effect. White transitions into self employment increased, but not black transitions. We cannot read too much into this result given the lack of statistical power, but the results are suggestive that discrimination in lending affected black entrepreneurs' ability to access bank financing. The possibility that discrimination in lending affects black entrepreneurs is consistent with the results we provide in Table 8.

There are several limitations to our analysis. For the purposes of our empirical analysis, we assume that within-state changes to credit card limits had an immediate effect on the rates offered to individuals with credit cards in that state, and that rate changes in other states had little to no effect on the rates offered within state. Evidence from Knittel and Stango (2003) is consistent with this assumption, but further investigation is warranted. However, because our analysis compares states with large changes in rates, that is, "no limit" states, to states with small or no changes in rates, this assumption means that any effect we find may be attenuated from the actual effect. For example, while a state may have retained an 18 percent cap, individuals in that state may, in later periods, be using out of state credit cards with much higher limits issued by a bank in a "no limit" state. Hence, any difference in self-employment or credit card use between such a state and a state that changes from an 18 percent limit to no limit will be reduced. The direction of this bias works against us finding a result.

Another limitation is that while we treat states' elimination of caps as an exogenous shock following the *Marquette* decision, we cannot explain why some states remove rate caps and others do not, let alone predict when a state will remove its cap. In unreported hazard models we find no evidence that self employment trends or proportion of black individuals in a state predict when a state will switch to no limit. Also, none of the political economy variables used by Kroszner and Strahan (1999) that predict when a state adopts banking deregulation predict when a state will switch to no limit.[8] It may be that states removing rate caps and subsequent increases in black transitions into entrepreneurship are endogenous. However, we surmise that it is unlikely that states removed interest rate caps because credit constrained black or white entrepreneurs lobbied the statehouse to change the law. Moreover, the text of the *Marquette* decision does not mention the impact of credit cards on entrepreneurs.

Finally, due to data limitations, we cannot directly observe that entrepreneurs who obtained credit cards after the *Marquette* decision actually used those cards to finance entrepreneurial ventures. We instead rely on several pieces of evidence that suggest this scenario occurred. We should point out that there may be a demand-related explanation for our results, as well. Namely, it could be that the increased availability of credit cards to black individuals led to increased spending by black individuals on goods and services sold by firms owned by self-employed blacks, which in turn led to the creation of more firms owned by self-employed black individuals. However, the fact that entrepreneurs own more credit cards than non-entrepreneurs argues against this demand-related explanation.

Our results have several implications for the academic literature and for public policy. The study makes a significant contribution to the empirical work on entrepreneurial finance by

[8] We thank Randall Kroszner and Philip Strahan for generously sharing this data with us.

showing that different types of entrepreneurs benefit from different types of finance. It is one of the few studies to focus on credit cards, which are one of the most important financing tools used by small-business entrepreneurs. In doing so, we have demonstrated that variation in credit card interest rates can influence entrepreneurial entry, most likely because credit card companies extend more credit when rates are uncapped. This effect appears most pronounced among individuals who are most likely to be denied credit prior to the increase in rates, namely black individuals. Thus, our results support the notion that public policies can have a significant impact on black and white self-employment rates. While the *Marquette* decision was not aimed specifically at increasing entrepreneurship, it appears to have indirectly stimulated entrepreneurial activity by encouraging states to eliminate credit card interest rates, thereby encouraging entry by more credit card firms, thereby making credit more available to black and white entrepreneurs. Finally, while our study focuses on a specific time period, 1971-1985, recent research (Ravina, 2008; Pope and Sydnor, 2010) demonstrates that discrimination still affects black borrowers. Hence, it may still be the case that credit cards are an important mechanism for overcoming discrimination based barriers to entry.

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Table 1

Credit Characteristics of States and Individuals

	No Limit State?		
	No	Yes	T-test
State Level HHI Credit Card Issuers (1983)	2259	1878	0.53
State Level HHI Credit Card Issuers (1986)	2698	1712	1.40
Credit Card Debt (1983)	283.58	370.35	-3.13
Credit Card Debt (1986)	942.35	1149.08	-2.10
Last Month's Credit Card Balance (1983)	204.35	275.63	-2.89
APR on Credit Card (1983)	17.72	18.17	-2.09
Number of Bank Issued Credit Cards (1983)	0.72	0.77	-1.32

Data on HHI of Credit Card Issuers is from Knittel and Stango; available for 33 states in 1983 and 38 states in 1986. Other credit data is from the Survey of Consumer Finances (SCF). The number of observations varies from 1900 to 4103, due to missing observations.

Table 2

Information on State Laws Affecting Availability of Finance (1971-1985)

State	No Limit on CC Rates	Intrastate Branching	Interstate Banking
Alabama		1981	
Alaska		<1971	1982
Arizona	1980	<1971	
Arkansas			
California		<1971	
Colorado			
Connecticut		1980	1983
Delaware	1981		
DC		<1971	1985
Florida			1985
Georgia		1983	1985
Hawaii			
Idaho	1983	<1971	1985
Illinios	1981		
Indiana			
Iowa			
Kansas			
Kentucky			1984
Louisiana			
Maine		1975	1978
Maryland		<1971	1985
Massachusetts		1984	1983
Michigan			
Minnesota			
Mississippi			
Missouri			

State	No Limit on CC Rates	Intrastate Branching	Interstate Banking
Montana	1981		
Nebraska		1985	
Nevada	1981	<1971	1985
New Hampshire	<1971		
New Jersey	1981	1977	
New Mexico	1981		
New York		1976	1982
North Carolina		<1971	1985
North Dakota			
Ohio		1979	1985
Oklahoma			
Oregon	1981	1985	
Pennsylvania		1982	
Rhode Island		<1971	1984
South Carolina		<1971	
South Dakota	1981	<1971	
Tennessee		1985	1985
Texas			
Utah	1982	1981	1984
Vermont		<1971	
Virginia	1983	1978	1985
Washington		1985	
West Virginia			
Wisconsin	1981		
Wyoming			

Table 3

Summary Statistics

	Full Sample				1977 Split Sample		
	Mean	*Std. Dev.*	*Min*	*Max*	*Limit*	*No Limit*	*T-test*
Trans. Self Employment	0.0081	0.0898	0.0000	1.0000	0.008	0.009	-1.10
Black	0.0892	0.2851	0.0000	1.0000	0.115	0.043	2.00
Female	0.3704	0.4829	0.0000	1.0000	0.352	0.347	0.92
Age	37.13	12.45	18.00	65.00	36.59	35.99	1.80
High School Grad	0.7878	0.4088	0.0000	1.0000	0.771	0.786	-1.04
Married	0.6487	0.4774	0.0000	1.0000	0.678	0.680	-0.29
Homeowner	0.5221	0.4995	0.0000	1.0000	0.680	0.690	-0.51
Household Income	27302	29123	-9997	999999	20745	20672	0.11
Unemployed %	0.0301	0.0109	0.0000	0.1089	0.024	0.023	0.51
Rural %	0.0120	0.0302	0.0000	0.2251	0.021	0.044	-1.61
No Limit	0.0951	0.2933	0.0000	1.0000			
Intrastate Banking Deregulation	0.4241	0.4942	0.0000	1.0000			
Interstate Banking Deregulation	0.0761	0.2652	0.0000	1.0000			

Note: A Limit state is a state that never switches to no limit. A No Limit state is a state that switches to no limit by 1985 (the last year of the dataset). 1977 is the year prior to the Supreme Court's Marquette decision, and the first year that the CPS includes information on all 50 states plus DC.

Table 4

Effect of No Limit Credit Card Interest Rates on Transitions into Self Employment (CPS Data, 1971-1985)

	(1)	(2)	(3)
Sample Restriction	All States	All States	No Limit States
No Limit on Credit Card Interest Rates	0.0029***	0.0024**	0.0025
	[0.0010]	[0.0011]	[0.0019]
Black*No Limit on Credit Card Deregulation		0.0068**	0.0067**
		[0.0027]	[0.0027]
Black	-0.0001	-0.0006	-0.0008
	[0.0007]	[0.0007]	[0.0010]
Individual Characteristics	YES	YES	YES
Industry Dummies	YES	YES	YES
Year Fixed Effects (1971-1985)	YES	YES	YES
MSA-State Fixed Effects	YES	YES	YES
Trend*MSA-State Fixed Effects	YES	YES	YES
Observations	312680	312680	72254
R-squared	0.0138	0.0139	0.015
Number of clusters	51	51	14

Robust standard errors in brackets, clustered at state level; * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5

Effect of No Limit Credit Card Interest Rates on Transitions into Self Employment (CPS Data, 1971-1985); Robustness Checks

Sample Restriction	(1) All States	(2) All States	(3) All States	(4) All States	(5) Low Cost Ind.	(6) High Cost Ind.
No Limit	0.0024**	0.0040	0.0024**	-0.0095	0.0016	0.0026
	[0.0011]	[0.0031]	[0.0011]	[0.0087]	[0.0029]	[0.0019]
Black*No Limit	0.0068**	0.0060**	0.0065**	0.0066**	0.0095*	0.0048*
	[0.0027]	[0.0027]	[0.0028]	[0.0027]	[0.0050]	[0.0025]
Black	-0.0006	-0.0005	0.0155	-0.0006	0.0004	-0.0005
	[0.0007]	[0.0007]	[0.0178]	[0.0007]	[0.0012]	[0.0007]
Individual Characteristics	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES
Year Fixed Effects (1971-1985)	YES	YES	YES	YES	YES	YES
MSA-State Fixed Effects	YES	YES	YES	YES	YES	YES
Trend*MSA-State Fixed Effects	YES	YES	YES	YES	YES	YES
No Limit*Individual Characteristics	-	YES	-	-	-	-
Black*Individual Characteristics	-	-	YES	-	-	-
Black*Industry Dummies	-	-	YES	-	-	-
No Limit*Industry Dummies	-	-	-	YES	-	-
Observations	312680	312680	312680	96319	96319	148630
R-squared	0.014	0.014	0.014	0.016	0.016	0.014
Number of clusters	51	51	51	51	51	51

Robust standard errors in brackets, clustered at state level; * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6

Effect of No Limit on Transitions into Self Employment (CPS Data, 1971-1985); Robustness Checks

	(1)	(2)	(3)
No Limit	0.0030***	0.0025**	0.0025**
	[0.0010]	[0.0011]	[0.0011]
Intrastate Banking Deregulation	-0.0001	-0.0001	-0.0002
	[0.0007]	[0.0007]	[0.0007]
Interstate Banking Deregulation	0.0014	0.0014	0.0016
	[0.0012]	[0.0012]	[0.0013]
Black	-0.0001	-0.0006	-0.0010
	[0.0007]	[0.0007]	[0.0007]
Black*No Limit		0.0068**	0.0065**
		[0.0027]	[0.0029]
Black*Intrastate Banking Deregulation			0.0012
			[0.0014]
Black*Interstate Banking Deregulation			-0.0016
			[0.0019]
Individual Characteristics	YES	YES	YES
Industry Dummies	YES	YES	YES
Year Fixed Effects (1971-1985)	YES	YES	YES
MSA-State Fixed Effects	YES	YES	YES
Trend*MSA-State Fixed Effects	YES	YES	YES
Observations	312680	312680	312680
R-squared	0.014	0.014	0.014
Number of clusters	51	51	51

Robust standard errors in brackets, clustered at state level; * significant at 10%; ** significant at 5%; **'

Table 7

Effect of No Limit Credit Card Interest Rates on Transitions out of Self Employment (CPS Data, 1971-1985)

	(1)	(2)	(3)	(4)	(5)	(6)
Transition into	Unemployment		Full time Wage		Part time Wage	
No Limit	-0.0011	-0.0006	0.0107	0.0113	-0.0127*	-0.0126*
	[0.0085]	[0.0085]	[0.0284]	[0.0284]	[0.0073]	[0.0073]
Black	0.0239***	0.0263***	-0.0532***	-0.0504***	0.0074	0.0080
	[0.0064]	[0.0071]	[0.0117]	[0.0133]	[0.0059]	[0.0066]
Black*No Limit		-0.0295*		-0.0347		-0.0069
		[0.0149]		[0.0311]		[0.0107]
Individual Characteristics	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES
Year Fixed Effects (1971-1985)	YES	YES	YES	YES	YES	YES
MSA-State Fixed Effects	YES	YES	YES	YES	YES	YES
Trend*MSA-State Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	36216	36216	36216	36216	36216	36216
R-squared	0.0402	0.0402	0.149	0.149	0.0513	0.0513
Number of clusters	51	51	51	51	51	51

Robust standard errors in brackets, clustered at state level; * significant at 10%; ** significant at 5%; *** significant at 1%

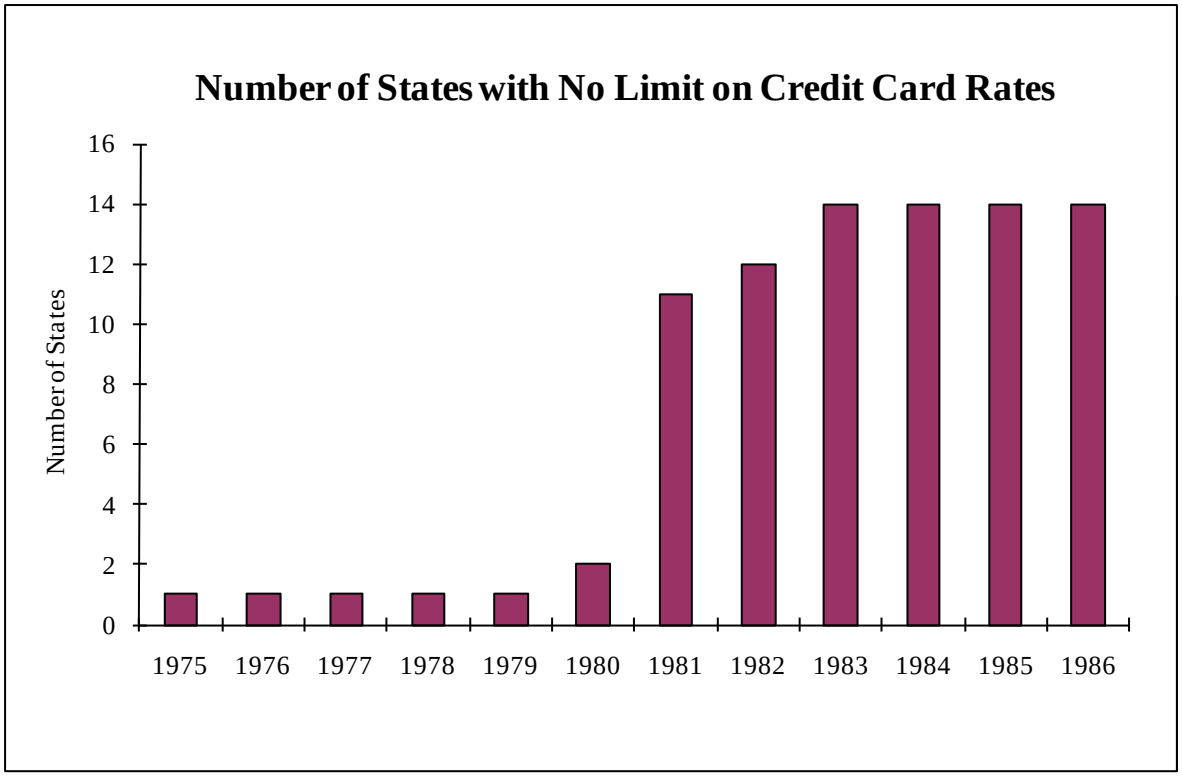
Table 8

Effect of No Limit Credit Card Interest Rates on Transitions into Self Employment (CPS Data, 1971-1985), by State Type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample Restriction:	*Former Slave State?*		*Anti-miscegenation Law?*		*No Fair Housing Law?*		*Interracial Marriage*	
	No	*Yes*	*No*	*Yes*	*No*	*Yes*	*Low Bias*	*High Bias*
No Limit	0.0029*	0.0018	0.0030**	0.0015	0.0014	0.0038**	0.0019	0.004
	[0.0015]	[0.0049]	[0.0015]	[0.0049]	[0.0023]	[0.0019]	[0.0017]	[0.0025]
Black*No Limit	0.0018	0.0129***	0.0016	0.0134***	-0.0026	0.0096***	0.0035*	0.0084**
	[0.0019]	[0.0039]	[0.0018]	[0.0040]	[0.0026]	[0.0023]	[0.0018]	[0.0042]
Black	-0.0008	-0.0026***	-0.0006	-0.0032***	-0.0002	-0.0034***	-0.001	-0.0035***
	[0.0007]	[0.0010]	[0.0007]	[0.0010]	[0.0007]	[0.0009]	[0.0006]	[0.0011]
Individual Characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects (1971-1985)	YES	YES	YES	YES	YES	YES	YES	YES
MSA-State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Trend*MSA-State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	328621	108852	331844	105629	261865	175608	303031	134442
R-Squared	0.0139	0.0174	0.0138	0.0179	0.0145	0.0153	0.0146	0.0163

Robust standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

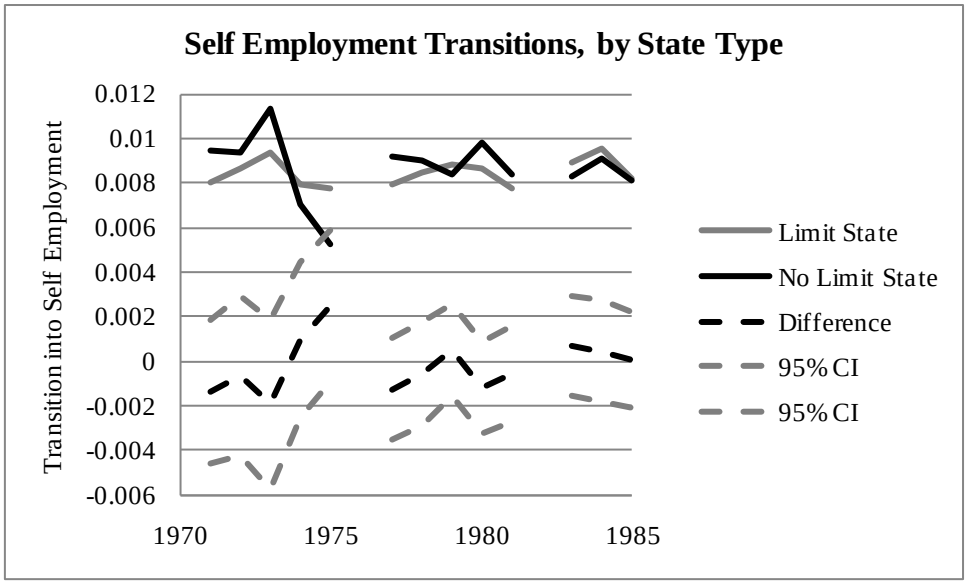
Figure 1



Source: The Cost of Personal Borrowing in the United States

Figure 1 shows the increase in state interest rate caps following the Supreme Court's *Marquette* decsion in 1978. By 1986, 14 states had no limit on interest rates, up from one (New Hampshire) before 1978. States that removed caps during this time period were: Arizona (1980), Delaware (1981), Idaho (1983), Illinois (1981), Montana (1981), Nevada (1981), New Jersey (1981), New Mexico (1981), Oregon (1981), South Dakota (1981), Utah (1982), Virginia (1983), Wisconsin (1981).

Figure 2



Source: Current Population Survey 1971-1975, 1977-1981, 1983-1985

Figure 2 shows self employment transitions by state type. Annual averages of states which become "no limit" states during the sample time frame (1971-1985) are indicated by the solid black line; states which do not switch to "no limit" during the sample time frame are indicated by the solid grey line. The black dashed line represents the difference, and the gray dashed lines represent the 95% confidence interval around this difference.

Appendix A: Race and Liquidity Constraints

Prior literature (Blanchflower, Levine and Zimmerman, 2003; Robb, Fairlie and Robinson, 2009) shows that blacks were more likely than whites to be turned down by bank lenders. In this appendix we verify that blacks were more likely than whites to be turned down, or feared being turned down, by bank lenders in the late 1970s and early 1980s. To do this, we report correlations between *black* and answers to selected questions from the 1977 and 1983 Survey of Consumer Finances (SCF), controlling for individual demographics and state of residence. The questions differ across the two surveys. For the 1977 survey, respondents were asked about their opinions on institutions that lend money or extend credit, including stores, banks, finance companies, and credit unions. Respondents were not asked to distinguish between lenders and creditors.[9] In column 1, we report results of answers to the question, "In your opinion, have you ever been treated unfairly in your credit transactions?" Black individuals were more likely to answer yes to the question, but this result is not statistically significant. In column 2, we report results of answers to the question, "Are there any (other) practices of creditors or lenders that you think are unfair and would like to see changed?" Black individuals were more likely to answer yes to the question, but again this result is not statistically significant. For the 1983 survey, respondents were asked about their experience obtaining loans or credit. In column 3, we report results of answers to the question, "In the past few years, has a particular lender or creditor turned down any request you (or your husband/wife) made for credit or have you been unable to get as much credit as you applied for?" Black individuals were more likely to answer yes to the question, and this result is statistically significant at the 10 percent level. In column 4,

[9] The specific language is: "In this interview please think of the terms 'creditors' and lenders' as the same thing."

we report results of answers to the question, "Was there any time in the past few years that you (or your husband/wife) thought of applying for credit at a particular place, but changed your mind because you thought you might be turned down?" (Emphasis in SCF survey questionnaire). Black individuals were more likely to answer yes to the question, and this result is statistically significant at the 1 percent level. Taken together, survey answers suggest that black individuals encountered frictions, or believed they would encounter frictions, in their access to financing. However, because of the way the questions were asked, we cannot distinguish if the frictions were primarily from lenders requiring face-to-face interactions, or from lenders such as credit card companies which did not require such interactions. It is worth noting that Blanchflower et al. (2003), using Survey of Small Business Finance data from 1993 and 1998, reported similar qualitative findings: that black-owned firms were more likely to report being concerned about credit market problems and less likely to apply for credit because of fear of being turned down.

SCF Survey Questions on Fairness of Lenders and Availability of Loans

	(1)	(2)	(3)	(4)
Dependent Variable:	*Treated Unfairly?*	*Unfair Practices You Want to Change?*	*Turned Down or Unable to Obtain?*	*Afraid of being Turned Down?*
Black	3.7915	2.1454	0.0692*	0.1155***
	[2.2671]	[1.5042]	[0.0370]	[0.0221]
Year	1977	1977	1983	1983
Individual Characteristics	X	X	X	X
Demographic Information	X	X	X	X
State Fixed Effects	X	X	X	X
Observations	1534	1534	2077	2080
R-Squared	0.032	0.047	0.090	0.071
Clusters	35	35	35	35

Robust standard errors in brackets; clustered at state. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. SCF excludes DC, HI, ID, KS, MD, MT, ND, NH, NM, NV, RI, VT, WV, WY.

Appendix B: Additional Results

This appendix contains additional results from the dataset not reported in the article.

B.1 Relationship between Individual Moves and Demographic Characteristics

In this appendix we investigate the demographics of individuals who undertake interstate moves. We use data from the CPS from 1980-1985 (data not available for earlier time periods). The coefficients on *selfemployed* and *black* are insignificant in all regressions, indicating that self employed individuals were no more likely to move than non-self employed individuals and that black individuals were no more likely to move than white individuals. These results give us confidence that the effects we report are not driven by a propensity of black or white entrepreneurs to move to states which have recently removed interest rate caps.

B.2 CPS Results on Smaller Subsamples

In this appendix, we verify the basic relationship between *black*no limit* and *self-employment* for smaller subsamples of the CPS data. The smaller subsamples more closely match the year and states for which Survey of Consumer Finance (SCF) data are available, and hence are helpful in verifying that the relationships in the next appendix are similar in direction and magnitude. Note that in anticipation of the limits of the SCF dataset we focus on self employment levels, rather than transitions into self employment, use state fixed effects, and do not include a trend interacted with the state fixed effect. For convenience, coefficients on explanatory variables other than *no limit* and *black*no limit* have been suppressed. Column (1) replicates the basic model used in Table 4 in the body of the paper, but uses fixed effects at the state level. Column (2) restricts the sample to only those states that are common across the CPS

and SCF dataset. Column (3) further restricts the sample to only those states and years that are common across the CPS and SCF dataset.[10] In general, the results show that when interest rates are allowed to rise individuals identified as black are more likely to be self-employed.

B.3 SCF Results with Credit Card Information

In this appendix we use data from the Survey of Consumer Finances (SCF) to examine the effect of removing credit card interest rate caps ("no limit") on self-employment, and the extent to which this effect varies by credit card ownership. In Column (1), the coefficient on *black*no limit* is positive and significant, indicating black individuals residing in a state which switches to no limit were more likely to be self employed. This result accords with the basic result presented in Table 4 in the body of the paper, and with the basic results in the prior appendix. In Columns (2) and (3) we investigate the effect of credit card ownership on self-employment. To do this, we split the sample into individuals who own a credit card in Column (2) and individuals who do not own a credit card in Column (3). The coefficient on *black*no limit* is positive and significant for the subsample that owns a credit card and positive but not significant for the subsample that does not own a credit card. We interpret this result as weak evidence that black individuals who own a credit card are more likely to be self-employed if they live in a state with no limit on credit card interest rates. While consistent with our argument, the difference in coefficients is not statistically significant (the p-value in a two-tailed test is

[10] The SCF covers years 1977, 1983, and 1986, but there is no CPS data from 1986, so 1985 is used instead. Also, as noted above, the SCF does not include information for DC, HI, ID, KS, MD, MT, ND, NH, NM, NV, RI, VT, WV, WY.

approximately 0.20). The low statistical power of the test is not surprising, however, given that the SCF dataset includes approximately 30 black self employed individuals.

B.4 Predicting Switch to No Limit

In this appendix we use state level data from several sources to examine the hazard of a state switching to no limit on credit card interest rates. We aggregate CPS data to the state level and match to state level data provided by Randall Kroszner and Philip Strahan. Column (1) includes all the demographic variables from the CPS, including a dummy for *self employed*. None of the coefficients are significant. Column (2) adds an interaction between *black* and *self employed*, which is also not significant. Column (3) adds four variables that Kroszner and Strahan (1999) show affect state level adoption of bank deregulation. These variables are small bank share of assets, the difference in the capital-asset ratio between large and small banks, the share of small firms in the state, and an indicator equal to one if there is single party control of the state government. None of these variables are significant.

Appendix B.1

Effect of Demographic Characteristics on Move to "No Limit State", using CPS Data

	(1)	(2)	(3)
Sample Restriction: From State?	*All Movers*	*From No Limit State*	*From Limit State*
Self Employed	-0.0024	0.0006	-0.0034
	[0.0018]	[0.0009]	[0.0022]
Black	-0.0005	0.0004	-0.0004
	[0.0006]	[0.0005]	[0.0006]
Female	-0.0003	-0.0005	-0.0003
	[0.0005]	[0.0006]	[0.0005]
Non-homeowner	0.0006	-0.0013	0.0000
	[0.0011]	[0.0013]	[0.0011]
Bottom 20 Percent Income	0.0001	0.0010	0.0000
	[0.0012]	[0.0010]	[0.0011]
Other Individual Characteristics	Y	Y	Y
Year Fixed Effects (Years>1980)	Y	Y	Y
Geographic Fixed Effects	Y	Y	Y
Observations	119735	3771	115964
R-squared	0.9557	0.9952	0.9528
Number of clusters	352	189	352

Robust standard errors in brackets, clustered at metro area-state level

* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Appendix B.2

Effect of Interest Rate Changes on Self-employment Using CPS Data Sub-Samples

	(1)	(2)	(3)
No Limit	0.0038	0.0008	-0.0003
	[0.0032]	[0.0030]	[0.0035]
Black*No Limit	0.0109**	0.0131**	0.0159**
	[0.0039]	[0.0040]	[0.0037]
Individual Characteristics	Y	Y	Y
Year	Y	Y	Y
State Fixed Effects	Y	Y	Y
State Subsample	CPS	SCF	SCF
Year Subsample	CPS	CPS	SCF
Observations	571034	496588	134711
R-squared	0.0288	0.0281	0.0266
Clusters	51	37	37

Robust standard errors in brackets; clustered at state
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent
SCF State Subsample excludes DC, HI, ID, KS, MD, MT, ND, NH, NM, NV, RI, VT, WV, WY
SCF Year Subsample includes only 1977, 1983, 1986
CPS Year Subsample includes 1971-1975, 1977-1981,1983-1985
CPS State Subsample includes all states.

Appendix B.3

Effect of Race on Self Employment Levels, by Credit Card Ownership, using SCF Data

	(1)	(2)	(3)
Sample Restriction: Owns Credit Card?	*No Restriction*	*Yes*	*No*
No Limit	-0.0309*	-0.0239	-0.0481
	[0.0182]	[0.0192]	[0.0306]
Black*No Limit	0.0774**	0.1011*	0.0045
	[0.0377]	[0.0520]	[0.0243]
Black	-0.0425***	-0.0441***	-0.0424***
	[0.0083]	[0.0072]	[0.0151]
Individual Characteristics	Y	Y	Y
Demographic Information	Y	Y	Y
Year Fixed Effects	Y	Y	Y
State Fixed Effects	Y	Y	Y
Observations	4889	3686	1203
R-Squared	0.0319	0.0367	0.0592
Clusters	36	36	35

SCF excludes DC, HI, ID, KS, MD, MT, ND, NH, NM, NV, RI, VT, WV, WY; SCF includes only 1977, 1983, 1986. Robust standard errors in brackets; clustered at state. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Appendix B.4

Hazard Model Predicting When a State Switches to No Limit

	(1)	(2)	(3)
Self Employed	0.4449	0.3811	0.6765
	[0.3908]	[0.3880]	[0.5977]
Black	0.1759	0.1425	0.3175
	[0.1469]	[0.1574]	[0.2959]
Female	0.0088	0.0160	0.1438
	[0.2260]	[0.2266]	[0.2980]
Homeowner	0.0176	0.0406	0.0646
	[0.1133]	[0.1199]	[0.1697]
Age	0.0094	0.0089	0.0183
	[0.0108]	[0.0107]	[0.0119]
High School Graduate	0.0247	-0.0018	0.3004
	[0.2087]	[0.2054]	[0.2826]
Married	-0.0744	-0.0794	0.0639
	[0.2524]	[0.2501]	[0.1710]
Unemployed	0.2714	0.2638	0.2938
	[0.4501]	[0.4528]	[0.5085]
Household Income	0.0293	0.0239	0.0069
	[0.1939]	[0.1954]	[0.2947]
Black*Self Employed		1.1448	0.6046
		[1.1066]	[2.0448]
Small Bank Share of Assets			0.4400
			[0.3313]
Diff. in Small-Large Bank Capital-Asset Ratio			1.1785
			[0.7147]
Share of Small Firms			0.1994
			[0.4501]
Single Party Control of State Gov't			-0.0186
			[0.0211]
State & Year Fixed Effects	YES	YES	YES
Observations	561	561	321
R-squared	0.3413	0.3419	0.4374
Number of clusters	51	51	37

Robust standard errors in brackets, clustered at state level