

Credit Access among Formerly Justice-Involved Entrepreneurs: Regression Discontinuity Evidence from the Paycheck Protection Program*

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June 13, 2025

Abstract

We study the impact of credit access and entrepreneurship within the justice-involved community. First, we link the Survey of Business Owners to respondents' criminal histories, finding that small business owners with criminal records receive less loan-based start-up and expansion capital and are more likely to report ceasing operations due to financial constraints. Second, we utilize a discrete criminal history-based eligibility rule from the Paycheck Protection Program in a regression discontinuity design, estimating the causal effect of federal loans on entrepreneurs with prior felony convictions. We find that loan eligibility improves business outcomes, reduces wage employment, and decreases future recidivism.

JEL Classification: H81, J24, K42

Keywords: self-employment, government small business loans, criminal histories

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1 Introduction

The United States has the world’s largest justice-involved population, amounting to over 79 million individuals with criminal records as of 2020 (Goggins and DeBacco, 2022). Despite the wide reach of the criminal legal system, people with criminal histories continue to face significant barriers to employment (e.g., Holzer, Raphael, and Stoll, 2003, 2007; Mueller-Smith and Schnepel, 2021; Pager, 2003). Unemployment is common, and even when justice-involved individuals do secure employment, they are often relegated to jobs of lower wages and quality (e.g., Garin et al., Forthcoming; Sugie, 2018; Western, 2002; Decker et al., 2015).

Faced with persistent challenges in the labor market, researchers and policymakers have identified entrepreneurship (or self-employment) as a potentially viable route for individuals with justice involvement to achieve economic independence.¹ Recent studies indicate that a significant portion, between 19 to 28 percent, of those with criminal records (depending on how specific population is defined) are self-employed, representing approximately 4 percent of all U.S. small business owners (Bushway et al., 2021; Finlay, Mueller-Smith, and Street, 2022; Hwang and Phillips, 2024). Moreover, the entrepreneurship rate of justice-involved individuals exceeds that of their non-justice-involved counterparts by 22 to 41 percent, in part because entrepreneurship provides an emancipation route from labor market discrimination (Finlay, Mueller-Smith, and Street, 2022; Hwang and Phillips, 2024). Simultaneously, recent policy initiatives such as the New Start Act of 2023² and a growing number of nonprofit organizations (e.g., Defy, Project ReMADE, LIFE Reentry Program for Women Prisoners, Inmates to Entrepreneurs, and the Prison Entrepreneurship Program) have endorsed entrepreneurship as a legitimate and promising route for justice-involved individuals to overcome the barriers they face in the traditional employment market.

While entrepreneurship is increasingly highlighted as a viable pathway for justice-involved individuals, there remains a significant gap in understanding whether the barriers they often face in other domains—such as employment, housing, and education—extend to the realm of entrepreneurship and its subsequent effects. On the one hand, an existing literature shows that traditionally marginalized groups confront challenges in entrepreneurship, particularly in securing credit for their business ventures, which can lead to negative economic outcomes

¹We define “entrepreneurship” as a labor market status or activity distinct from paid employment (Sørensen and Fassiotta, 2011), and use the term interchangeably with “self-employment” and “small business ownership.”

²The New Start Act provisions funds through the Small Business Administration to grant up to \$500,000 per year to organizations to give entrepreneurship training to formerly incarcerated individuals. For more information, see the press release issued by the U.S. Senate Committee on Small Business & Entrepreneurship here: <https://www.sbc.senate.gov/public/index.cfm/2023/3/cardin-reintroduces-legislation-to-empower-returning-citizens-to-start-businesses>.

(Blanchflower, Levine, and Zimmerman, 2003; Fairlie and Robb, 2007*a*; Chatterji and Seamans, 2012). Quantitative literature in macroeconomics further indicates that barriers to financing can cause underinvestment and the misallocation of resources in the economy, generating aggregate losses in output and welfare (Buera, Kaboski, and Shin, 2015; Hsieh and Klenow, 2009). Yet, on the other hand, the credit restrictions imposed by government institutions, such as the Small Business Administration (SBA), and private lenders are often based on valid concerns, including the prevention of potential fraud and loan default due to reengagement with the criminal legal system. Researchers have also found that extending financial assistance to justice-involved individuals through cash assistance, food stamps, and welfare benefits often yields inconclusive or unintended negative outcomes (Luallen, Edgerton, and Rabideau, 2018; Mueller-Smith et al., 2024; Rossi, Berk, and Lenihan, 1980). This raises two critical questions. Do justice-involved entrepreneurs experience compounded hurdles in accessing credit, and how productive are investments in their businesses? This paper pioneers the investigation into the credit barriers that justice-involved entrepreneurs encounter and the causal measurement of subsequent effects of credit barriers on their small business success, shifts into paid-employment, and recidivism.

To start, we document the first nationally representative, descriptive estimates in credit barriers for entrepreneurs, namely Schedule C filers, with and without a felony conviction. Using microdata from the Survey of Business Owners and Self-Employed Persons (SBO) linked for the first time with person-level criminal histories contained in the Criminal Justice Administrative Records System (CJARS), we find that small business owners with a felony conviction are 1.2 percentage points (19 percent) less likely to receive a loan for start-up capital, 1.5 percentage points (21 percent) less likely to receive a loan for expansion capital if looking to expand, and 1.6 percentage points (56 percent) more likely to report a lack of access to capital as the reason for ceasing operations if no longer open, compared to similar small business owners without a felony conviction.³

Next, we measure the causal effects of credit access among existing small business owners with a felony conviction on their subsequent business success, shifts into paid employment, and recidivism. Identifying a causal impact of credit access is challenging because observed and unobserved characteristics associated with credit access are likely correlated with other outcomes of interest. We leverage a discrete eligibility rule by SBA during the COVID-19 pandemic for small business Paycheck Protection Program (PPP) loans that required applicants to have no felony conviction in the preceding 60 months. This new requirement

³Throughout the paper, we report point estimates and relative effect sizes based on the outcome mean, which have an implied range based on standard errors reported in the associated tables. Formal statistical tests are also reported in the tables at conventional levels, 10%, 5% and 1%.

was designed to be less holistic and more formulaic than previous SBA review criteria to accelerate implementation, which, as a byproduct, generates a regression discontinuity design that we can leverage to overcome endogeneity concerns.⁴ A review of the loan density and applicant characteristics confirm the validity of this novel source of exogenous variation in credit access.

We begin by showing that business owners marginally eligible for PPP funding based on the date of their last felony conviction are indeed more likely to receive a PPP loan in the first wave of the program (65 to 74 percent), which translates to a significant increase in total PPP funding receipt. Correspondingly, we find positive impacts on small business success, measured by tax filing behavior associated with continued entrepreneurship activity, increases in total business revenue, and an increase in business-wide payroll wages. Interestingly, PPP eligibility decreases the likelihood of paid employment by 8 percent and lowers W-2 earnings, likely reflecting a diminished need to find outside employment to supplement self-employment.

We then document the effects on future criminal convictions. We find that marginally eligible business owners are 44 to 53 percent less likely to receive a new conviction over the first 12 months of the PPP program. Specifically, we observe significant reductions in convictions related to violence, substance abuse, and financial crimes/fraud. These findings contrast with the original logic used in developing the SBA PPP eligibility rules: that recent felons may abuse the funds for fraudulent purposes or be unable to maintain the terms of the loan due to continued contact with the criminal legal system. Instead, the results identify a unique incentive for public agencies to support entrepreneurs with criminal records: limiting the externalities imposed on society resulting from criminal activity.

Finally, we conduct a return on investment (ROI) exercise based on the change in total revenue between 2019 and 2021 divided by the loan amount to measure the ROI for all Schedule C filers receiving a PPP loan in the first wave. The goal is to understand how small business owners with felony records perform relative to their counterparts without a felony record. We find that the distribution is quite similar among marginal business owners with criminal records and PPP loan recipients who have *never* had a felony record. Given the government’s stake in public safety, the effective ROI after accounting for crimes avoided places justice-involved entrepreneurs favorably in the distribution of business outcomes.

Our findings on the effects of access to credit among justice-involved entrepreneurs pro-

⁴The PPP, passed by Congress at the start of the COVID-19 pandemic and distributed through SBA, offered critical financial assistance to small businesses. Unlike other SBA programs that employ subjective guidelines to assess how one’s criminal history might influence creditworthiness, the PPP initially included explicit eligibility rules categorically precluding some justice-involved entrepreneurs from participating. See Section 2.3 for more details.

vide important insights for research and policy. As one of the first papers to examine the credit barriers that justice-involved individuals face in entrepreneurship, this study contributes to extending our understanding of the diverse barriers and challenges that justice-involved people face in achieving economic self-sufficiency. As most studies on justice-involved individuals have focused on employment barriers, our knowledge of the potential barriers and challenges to entrepreneurship, an increasingly important alternative labor market choice, has been sparse. While the policy variation we study originates from the COVID-19 era, we are aware of no other study to-date with credible causal identification regarding the impact of credit access among justice-involved entrepreneurs. Importantly, while our findings are based on an emergency SBA loan program, the mechanisms through which credit access improves entrepreneurial and criminal outcomes – such as increased capital for business operations and reduced financial precarity – are not unique to the pandemic, suggesting that our results likely generalize to broader SBA programs and other credit access initiatives. As policymakers highlight and promote entrepreneurship as an effective strategy for the reintegration of justice-involved individuals, our findings provide much-needed insight into how expanding credit access for justice-involved individuals, particularly for those already engaged in small business activity, will improve their reentry outcomes and strengthen their communities.

2 Background

2.1 Entrepreneurship among justice-involved individuals

Recent studies have highlighted the significant share of justice-involved individuals engaged in self-employment. Using linked Form 1040 and Schedule C tax records with Criminal Justice Administrative Records System (CJARS), Finlay, Mueller-Smith, and Street (2022) document that 28 percent of tax filers who are ever convicted or in the corrections system were self-employed business owners, with the highest rate among those with felony records. They also note that justice-involved individuals have a 22 percent higher likelihood of self-employment compared to those without justice involvement, adjusting for age, race, sex, education, and commuting zone. Similarly, using the National Longitudinal Survey of Youth 1997 (1997–2015), Hwang and Phillips (2024) show that approximately 19 percent of formerly incarcerated individuals engage in self-employment, a level 41 percent higher than similar never-incarcerated counterparts.

Overall, the share of justice-involved individuals among all self-employed individuals in the U.S. is a relatively small but significant share, with disproportionate representation

among minority business owners. Using data from a national background check company, Bushway et al. (2021) estimated that about 4 percent (1.5 percent) of all small business owners in the U.S. have a criminal history (felony record), amounting to roughly 1.1 million entrepreneurs (over 400,000). Finlay, Mueller-Smith, and Street (2022) also show that 2.7 percent of all self-employed entrepreneurs have a criminal record, with the highest rates for Black and Hispanic business owners.

This documented prevalence of entrepreneurship among justice-involved individuals highlights entrepreneurship as a response to the compounding barriers to traditional employment for people with criminal records in the traditional labor market.⁵ Hwang and Phillips (2024) identify these structural barriers in wage-employment as one of the key drivers of entrepreneurship for the justice-involved population, where Black formerly incarcerated individuals are more likely to engage in entrepreneurship in jurisdictions where they are faced with greater employment barriers (i.e., jurisdictions without Ban-the-Box policies).⁶ The authors also find that because entrepreneurship provides a pathway to circumvent traditional employment barriers, formerly incarcerated entrepreneurs experience 24 percent higher annual earnings compared to formerly incarcerated individuals in traditional employment, contributing to a 30 percent reduction in recidivism rates. These recent descriptive papers mark a pioneering effort to shed light on self-employment as an important potential avenue for justice-involved individuals to navigate labor market barriers and achieve greater economic self-sufficiency.

At the same time, policymakers and various non-profits have endorsed entrepreneurship and self-employment as viable pathways for justice-involved individuals to attain economic independence and mobility. Recently, the Chairman of the Senate Small Business Committee introduced The New Start Act of 2023, which would fund entrepreneurial development programs that serve justice-involved individuals. The New Start Act would not only provide training and entrepreneurial education to the justice-involved population, but it would also invest in organizations that award microloans to would-be entrepreneurs. While this is the first effort targeting entrepreneurship among justice-involved individuals at the federal level, a handful of states and local jurisdictions already offer entrepreneurship programs as part

⁵A line of literature suggests self-employment as a viable option predominately for those who face discrimination in the formal labor market from family duties, sex, immigration status, and race (e.g., Aldrich and Waldinger, 1990; Yang, Kacperczyk, and Naldi, 2024) since the income and other benefits offered from employer-based employment generally far exceed lifetime earnings from self-employment (Hamilton, 2000; Heilman and Chen, 2003). This reasoning naturally extends to those with criminal records who are also stigmatized in the labor market sector (e.g., Pager, 2003; Holzer, Raphael, and Stoll, 2003; Bushway, Stoll, and Weiman, 2007).

⁶Scholars have also found individual-level mechanisms that also drive justice-involved individuals into entrepreneurship, such as risk preferences and entrepreneurial predisposition (e.g., Fairlie, 2002; Levine and Rubinstein, 2017; Gottschalk, 2009).

of education and training in prison and post-release support services.⁷ The largest funders of these programs are non-profits, including Defy Ventures, Inmates to Entrepreneurs, and the Texas Prison Entrepreneurship Program (PEP), which focus on both entrepreneurial training and funding to support justice-involved populations embarking on entrepreneurship. These programs have found positive outcomes for those participating in the program in terms of new business starts and reduced recidivism. For example, Texas PEP has led to the foundation of over 500 businesses, and participants have an 7 percent recidivism rate versus a national average of nearly 50 percent (Prison Entrepreneurship Program 2020). A recent study comparing accepted and trained individuals to accepted and untrained individuals finds a 12–38 percent reduction in recidivism (Hill, 2022). Anecdotal evidence from other entrepreneurial training programs, such as Defy Ventures, which achieved a recidivism rate of 7 percent, further suggests a positive impact of entrepreneurship training on reducing recidivism. Both of these programs and many others, offer initial seed funding for the program participants, which may be a critical component given the potential barriers people with criminal records face in accessing capital.

2.2 Barriers to credit for justice-involved individuals

The prevalence and positive outcomes of entrepreneurship for justice-involved individuals advance entrepreneurship as an attractive way forward for this population. Yet opportunities to become a successful entrepreneur are not evenly distributed across population groups. Factors that are critical for successfully starting and sustaining a business, particularly access to credit, are disproportionately available to those who are already advantaged, creating barriers to entrepreneurship for those who lack access (Kim, Aldrich, and Keister, 2006; Blanchflower, Levine, and Zimmerman, 2003). A body of research indicates that groups facing disadvantages in the labor market, such as racial minorities and women, also encounter similar obstacles in entrepreneurship (Thébaud and Sharkey, 2016; Robb and Fairlie, 2007; Fairlie and Robb, 2007*b,a*). For example, Black entrepreneurs often struggle with obtaining startup capital, leading to shorter business lifespans and smaller sizes (Blanchflower, Levine, and Zimmerman, 2003; Robb and Fairlie, 2007; Chatterji and Seamans, 2012). In parallel, studies show that women entrepreneurs, despite having similar qualifications and business prospects, face discrimination from investors and lenders (Bigelow et al., 2014; Brooks et al., 2014; Shane, 2012; Thébaud, 2015*a,b*). These financial frictions lead to aggregate economy-wide losses due to the underinvestment and misallocation of critical funds to entrepreneurs

⁷For example, there are publicly funded entrepreneurial training programs for justice-involved individuals such as ASPIRE MO in Missouri, the Pathway to Enterprise for Returning Citizens (PERC) program in Illinois, and the Aspire to Entrepreneurship program in Washington, DC.

(Buera, Kaboski, and Shin, 2015; Hsieh and Klenow, 2009).

Investigating the credit barriers faced by justice-involved individuals is crucial, yet our current understanding is limited, with only a handful of related studies. Qualitative research indicates that individuals with a criminal history often struggle to secure loans from commercial banks, largely due to their criminal record and the associated collateral consequences like lower credit scores (Baskaran, 2018). In the only empirical work on credit scores and access to personal credit among incarcerated individuals, Aneja and Avenancio-León (2020) find a 42–57 point drop in credit scores for incarcerated individuals after release. Using evidence from sharp credit score cutoffs, they also show that a lack of access to mortgages and auto loans may increase recidivism by up to 18 percentage points, a 46 percent increase from an overall mean of 39 percent.

The personal finance barriers only compound the business loan barriers for self-employed individuals with criminal records. For example, the Small Business Administration (SBA), the largest loan-granting agency for small businesses, has historically restricted aid to business owners with criminal records and required applicants to disclose all criminal histories in order to determine character and creditworthiness. Specifically, the SBA Paycheck Protection Program (PPP) initially excluded businesses with owners who had recent criminal histories, amounting to the exclusion of up to 212,655 (0.5 percent) small businesses (Bushway et al., 2021). Finlay, Mueller-Smith, and Street (2022) find that nearly 3 percent of business owners were ineligible for PPP due to justice involvement, with this ineligibility disproportionately affecting Black and Hispanic men. In addition, barriers to business credit and capital for justice-involved entrepreneurs extend beyond government loans to private financial institutions, where Hwang (2021) finds that formerly incarcerated entrepreneurs are over 55 percent less likely to obtain financial capital from financial institutions or the government compared to non-incarcerated entrepreneurs.

Facing these financial challenges and constraints, many formerly incarcerated individuals turn to personal savings or support from family and friends. Consequentially, they often start businesses in low-capital and low-growth industries like construction, “other services”, or waste management rather than capital-intensive and high-growth sectors such as finance, mining, manufacturing, and real estate (Hwang, 2021; Finlay, Mueller-Smith, and Street, 2022). While we have limited understanding from prior work as to whether such financial constraints causally lead to negative business outcomes (e.g., business size, revenue growth, or survival rates) among justice-involved entrepreneurs, research on other minority groups such as Black entrepreneurs shows that expanded credit access raises business size by 5-7 percentage points (Kim et al., 2021).

Yet it remains uncertain whether increased access to credit for self-employed individuals

with a criminal record yields positive outcomes. The barriers to credit imposed by the governmental and private lenders are rooted in potentially valid concerns. Extending credit or business loans to justice-involved entrepreneurs may heighten the risk of fraudulent behavior and default due to their possible ongoing involvement with the criminal justice system or the inherent challenges in achieving business success.⁸

Relevant research has found that providing financial support to justice-involved individuals through cash assistance, Supplemental Nutrition Assistance Program (SNAP) or food stamps benefits, and Supplemental Security Income (SSI) support has not consistently demonstrated positive outcomes and has, in some cases, led to unintended negative consequences. For instance, some studies find no evidence that receiving welfare and food stamp benefits decreases recidivism among justice-involved individuals (Luallen, Edgerton, and Rabideau, 2018; Mueller-Smith et al., 2024), while others find that cash assistance alone is insufficient to sustain positive economic outcomes or reduce criminal activity (Yang, 2017; Tuttle, 2019; Deshpande and Mueller-Smith, 2022). Historical studies from the 1970s and 1980s also suggest that welfare benefits can increase recidivism by discouraging work (Rossi, Berk, and Lenihan, 1980; Berk, Lenihan, and Rossi, 1980), and some recent quasi-experimental work on payment cycles also provides some supportive evidence for increases in drug use and domestic violence following benefit dispersal (Carr and Packham, 2021; Abdelrahman and Schnepel, 2021; Dobkin and Puller, 2007). Additionally, studies examining the effects of welfare programs on a broader low-income, at-risk population indicate that cash assistance can increase the consumption of “temptation goods” like drugs and alcohol, as well as goods that elevate the expected utility of crime through a “loot effect”, consequently leading to an increase in crime (Riddell and Riddell, 2006; Dobkin and Puller, 2007; Evans and Moore, 2011; Castellari et al., 2017; Wright et al., 2017). While these findings of potential null or negative consequences of financial support for individuals with criminal records primarily pertain to public assistance, which differs significantly from credit access, it remains inconclusive whether increased credit access for justice-involved business owners may lead to negative outcomes in line with the concerns of the SBA and private lenders.

2.3 SBA loans and justice-involved small business owners

The SBA plays a unique lending role for small businesses, as its objective is to promote equitable business growth and resilience of small businesses rather than merely earn a return on investment. For example, it conducts special outreach to women, racial minorities, and

⁸Biden-Harris Administration Fact Sheet can be found here: <https://www.whitehouse.gov/briefing-room/statements-releases/2024/04/25/fact-sheet-biden-harris-administration-celebrates-second-chance-month-announcing-new-actions-to-strengthen>

veterans, and they provide relief for natural disasters. The SBA has several small business loan guarantee programs, among which the 7(a) and 504 loan programs are the top two lending programs both in number of loans and amount. Together, the 7(a) and 504 loan programs amounted to over \$44.7 billion in lending support to over 61,000 small businesses during the fiscal year 2021.⁹ During the COVID-19 pandemic, SBA additionally provided PPP loans. The PPP program was created by the Coronavirus Aid, Relief, and Economic Security Act, which was enacted on March 27, 2020, to offer assistance to small businesses facing economic hardship amid the pandemic. Initially, Congress allocated \$349 billion, which was quickly exhausted, adding \$310 billion a month later. Two more allocations of \$284 and \$7 billion were later approved to replenish funding in December 2020 and March 2021, respectively.

The PPP loans offered desirable loan terms and had the ability to be forgiven as long as the provided documentation showing the loan was used to cover payroll costs, and most mortgage interest, rent, and utility costs over the 8 week period after the loan is made, and employee and compensation levels were maintained.¹⁰ While the vast majority of loans were ultimately forgiven, business owners were uncertain about their ability to receive forgiveness on their loans. Specifically, the Federal Reserve Bank estimates that over half of the business owners reported a concern that their loan would not qualify for forgiveness. It is unclear exactly how business owners viewed the program in terms of forgiveness at the time of application, but we view the findings of this program as broadly applicable to other loan or grant-based programs aiming to ease liquidity constraints and bolster entrepreneurship among those with criminal histories.

The SBA 7(a) and 504 loan programs have historically collected criminal history information on Form 912 to determine character and creditworthiness. Small businesses are ineligible for loans if the business has an owner who is currently incarcerated, under community supervision, or facing charges. In addition, SBA also requires that small business owners “must be of good character” (Small Business Administration, 2020, p.152), which is determined by a rigorous character evaluation process that includes close attention to an applicant’s past criminal record and association with crimes of “moral turpitude” (Small Business Administration, 2017, p.227).¹¹ While these restrictions imply that justice-involved

⁹Source: <https://www.sba.gov/article/2021/oct/29/sba-administrator-guzman-announces-448-billion-through>

¹⁰The initial PPP loans would mature in two years, have deferred payments for the first six months with a 1 percent interest rate, and not require collateral or service fees. Loan applications required extensive documentation, including past payroll, and loan forgiveness required would require documentation of payroll and payments on mortgage, lease, and utility obligations. See more here: <https://home.treasury.gov/system/files/136/PPP--Fact-Sheet.pdf>.

¹¹SBA eliminated the “moral turpitude” clause from its loan origination policies in January 2018 and eliminated the “good character” clause in August 2023. Source: <https://www.sba.gov/document/>

business owners will likely face institutionalized barriers to financial access from SBA loan programs due to their criminal histories, the lack of specific standards to guide loan decisions leads to uncertainty about the extent of the barrier.

For the PPP, SBA implemented more explicit eligibility restrictions for those with criminal histories to determine character, the ability to repay loans, and potential for fraud. Specifically, the original application excluded businesses with an owner of at least 20 percent or more equity who was currently in prison, on parole, on probation, had a pending charge, or was convicted of a felony within the last five years. While other criminal history disqualifications left more ambiguity (e.g., having a pending charge),¹² time since felony conviction was deterministic and easy to verify. This created discrete jumps in eligibility that we use in our identification strategy. The criteria were modified, however, in June 2020 to narrow the scope of ineligible criminal histories in response to requests by politicians, business owners, and new research showing the extent to which the broad ban affected small business owners (Finlay, Mueller-Smith, and Street, 2022; Defy Ventures, Inc. v. U.S. Small Business Administration, 2020). Under the new rule, only those who were currently in prison, convicted of a felony within the last year, or convicted of a financial crime within the last five years, were still barred from eligibility. Under the revised 2021 PPP restrictions, the number of business owners ineligible for PPP loans dropped by 95 percent from 212,655 to 11,481 businesses (Bushway et al., 2021). The restrictions were again narrowed in scope in February 2021, removing the restriction for any felony in the past year while maintaining the 5-year financial felony restriction. Because of the changing regulations, we focus on PPP eligibility in what we term the first wave (i.e., prior to regulation changes on June 30, 2020) and interpret this variation as a natural experiment that altered both expectations of and access to critical funding during an uncertain time.

In general, the criminal history restrictions set by the SBA, in the 7(a), 504, and initial PPP loans, were intended to accomplish three goals: 1) to avoid loaning money to those who may not be able to complete the terms of the agreement due to involvement in the criminal legal system (i.e., returning to prison), 2) to mitigate the risk of fraud, waste, and abuse of the program, and 3) to determine creditworthiness. However, the SBA has more recently proposed new regulations that would significantly narrow the role of criminal histories for applicants across all loan programs.¹³ The goal of these modified rules is to make

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¹²An early complaint of the initial restrictions was that it was not clear whether having a pending charge was only relevant for felony, misdemeanor or even criminal traffic offenses or how it would be verified.

¹³Specifically, the proposed rules would 1) standardize rules across all SBA loan programs; 2) reduce confusion and subjectivity (e.g., by clarifying what is considered a “crime of moral turpitude”); 3) eliminate detailed questions related to criminal histories and instead only request and verify current incarcerated status and past fraud on SBA programs; 4) continue to allow SBA lenders to follow

SBA programs more accessible to those seeking a second chance, namely justice-involved people. Ultimately, in choosing to disqualify applicants with criminal histories, the benefits of imposing credit barriers to business owners with criminal records must be weighed against the costs of reducing the economic self-sufficiency of business owners with criminal records. For example, the SBA must balance concerns over recidivism and fraud against the benefits of small business owners who use credit to support themselves.

While SBA is only one institution in the lending market, it is the largest single lender and its loans are likely more accessible than loans through private lenders due to SBA’s goal of equitable lending. It is also possible that private banks, especially regional institutions, may follow SBA’s lead in assessing eligibility criteria. Thus, understanding access to credit within the SBA context is ideal both due to the discrete nature of eligibility to identify causal effects and the role SBA plays in small business lending more generally. Our results are the first to speak to the effect of business loan access among those with criminal records, speaking directly to the potential costs and benefits of SBA’s proposed policy changes.

3 Data sources and linkages

We use integrated administrative and micro-survey data within the Census Bureau Data Linkage Infrastructure to conduct both the descriptive and causal research described in this paper. These sources include IRS Form 1040 and Schedule C individual tax filings, responses to the Survey of Business Owners and Self-Employed Persons (SBO), Small Business Administration (SBA) loan administrative records, and criminal histories from the Criminal Justice Administrative Records System (CJARS). All of these datasets can be linked at the person level using Protected Identification Keys (PIKs).¹⁴

To quantify the extent of credit barriers for justice involved individuals, we link respondents from the 2002, 2007, 2012 survey waves of SBO with Form 1040 return, Schedule C

their own policies on criminal background checks; and 5) deem business owners who are currently incarcerated or have previously committed fraud against the government to be ineligible for all programs. For more information, see SBA press release #23-66 here: <https://www.sba.gov/article/2023/09/14/returning-citizens-empowered-start-grow-businesses-under-proposed-rule>.

¹⁴The U.S. Census Bureau uses the Personal Verification System (PVS) to probabilistically link records to anonymized PIKs, which allows person-level linkages within the restricted environment (Wagner and Layne, 2014). Individuals who are not assigned a PIK are not included in our samples throughout due to the inability to link across datasets. Because our results are constructed from a combination of population-level administrative data, rather than a probability sample, sampling error does not apply. Non-sampling error, however, still exists. For instance, administrative records data may contain measurement error because of issues such as coverage problems (e.g., the data source may not cover certain populations as well as others); linking or matching issues which could affect accuracy or precision; conceptual and timing misalignments; reporting errors; definition and classification difficulties; errors in recording or coding the data obtained; and other errors of coverage, processing, and estimation for missing or misreported data.

filings, and criminal histories. The SBO provides nationally representative individual-level responses to small business financing questions related to start-up capital sources, expansion capital, and closure reasons if no longer operating, along with owner demographics (e.g., race, sex, age, and education) and business characteristics (e.g., total receipts and industry).¹⁵ However, like most surveys, the SBO does not include information on criminal histories. Thus, we match business owners to their criminal histories using CJARS, which allows us to document differences in small business funding by felony conviction status as of the survey year.

Criminal histories are measured using the CJARS, which integrates and harmonizes decentralized criminal history information from across the United States (Finlay, Mueller-Smith, and Papp, 2022). In the data, we observe dated incidents of criminal charges, convictions, and corrections events. Specifically, we identify felony convictions, which are the focus of this paper for three reasons: 1) felony convictions are more prevalent than incarceration events, affecting 8 percent of adult men and 33 percent of Black men (Shannon et al., 2017); 2) felony convictions are a salient labor market signal (Mueller-Smith and Schnepel, 2021); and 3) loan eligibility for PPP relies on the timing of past felony convictions. We focus on 13 states where we can consistently observe court records throughout our analysis period: Arizona, Florida, Maryland, Michigan, Minnesota, New Jersey, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Texas, and Wisconsin. These states represent nearly 40 percent of the U.S. population in 2020 and 36 percent of Schedule C filers in the U.S. in 2019.¹⁶

To document the causal effect of credit barriers for justice-involved individuals, we focus on Schedule C filers in 2019 and link their associated Form 1040, Schedule C filings, SBA loans, and criminal histories at the person level. Using Schedule C filings and Form 1040s to measure self-employment provides us with a subset of all small businesses in the U.S., yet Schedule C filers make up the vast majority of self-employed individuals in 2019.¹⁷ We

¹⁵See a copy of the survey questionnaire here: https://www2.census.gov/programs-surveys/sbo/questionnaire/2012/2012-sbo-questionnaire/sbo1_2012.pdf. The respondents of the survey with a PIK are limited to Schedule C filers. The three most recent SBO survey waves of 2002, 2007, and 2012 are used, as they include detailed questions related to business financing. Although using survey rounds conducted several years prior may pose limitations, we assume that similar patterns of financial barriers have persisted over time. Non-response in the survey is not imputed, and answers are not mutually exclusive; thus, the options for financing or business closures need not sum to 1.

¹⁶Authors' calculations from <https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html#v2023> and <https://www.irs.gov/statistics/soi-tax-stats-historical-data-tables> Table 21c.

¹⁷Specifically, we do not observe partnerships filing a Schedule K-1 (Form 1065) or Schedule E (Form 1040); corporations filing Form 1120 and either a Form 941, 943, or 940 for tax withholding; S-corporations filing a Form 1120-S and Schedule K-1; and some limited liability companies (LLCs). The IRS treats single-member LLCs as sole-proprietors (observed) and multi-member LLCs as partnerships (not observed). LLCs

also link the Census Bureau Business Register, which has detailed business information for Schedule C filers, including the business owner, total revenue, payroll bill, and NAICS codes. Importantly, we are able to link individuals to loan receipts and loan amounts using SBA administrative data for 504, 7(a), and PPP loans. Unfortunately, we do not observe applications for SBA loans as well since loans are administered through a network of financial institutions that only provide information on approved loans to SBA.

In the causal analysis, we similarly focus on the same 13 states with sufficient historical CJARS coverage to adequately measure criminal histories. The dated incidents in CJARS are critical for our identification strategy, allowing us to measure eligibility down to the exact day. We measure any future conviction, whether misdemeanor or felony, as our main outcome of recidivism over 9, 12, and 18-month periods. For most states, we can measure future convictions through 2021 and for some states into 2022 (Finlay and Mueller-Smith, 2022).¹⁸ We also observe the offense type for convictions, which we classify as violent, income generating, financial, substance abuse, and all others.¹⁹ Financial felonies are a subset of our definition of income-generating offenses (following SBA criteria on financial crimes) but are separated due to the specific interest in financial offenses related to loan eligibility.

We are able to measure a range of other outcomes for this research sample, including loan receipt using SBA microdata, and entrepreneurship and labor market outcomes using Schedule C filings, the Census Bureau Business Register, and W-2 information returns.²⁰ It is important to keep in mind that it is relatively low cost to file a Schedule C; thus, while we use it to measure continued self-employment, it is an imperfect measure of business success or survival, as businesses likely continue to file unless they filed for bankruptcy or sold off their businesses.

4 Patterns of credit access and business operations

Using the newly linked SBO waves, we document covariate-adjusted differences in reported funding sources and business operations for owners with and without felony records by the

can also opt to be treated as corporations, in which case they are not observed. Independent contractors and self-employed people who receive a Form 1099-MISC report income and expenses on a Schedule C.

¹⁸Since coverage varies across geographies, we cannot observe the full 18-month follow-up period for all geographies in the sample. In these cases, we use as much follow-up as is available in order to maintain a balanced sample, but this may lead to slightly more muted effects for longer follow-up windows.

¹⁹These classifications rely on the Text-based Offense Classification tool (Choi et al., 2023). The ten most common offenses in each category are listed in Appendix Table A1.

²⁰Schedule C filers do not receive a W-2 at their business. Rather, all revenue net of expenses is taxed as self-employment income. Similarly, the Schedule C payroll bill does not include money paid to the owner, rather it is money paid to their employees. Total revenue and the payroll bill from Schedule Cs are rounded to the nearest thousandth, making it a coarser measure.

time of the survey in Table 1.²¹ Given differences in both owner and business characteristics across criminal record status, we control for the demographics of the business owner, such as sex, race, age, and education, as well as business characteristics, including business age, industry, and total receipts.²² While these exercises are descriptive in nature, in the absence of preexisting nationally representative estimates, this evidence fills an important void in the literature.

In Table 1 Panel A, we document whether small business owners with and without a felony conviction differed in their likelihood of utilizing the four sources of capital at the stage of business formation. Specifically, we compare the likelihood of utilizing the four sources of start-up capital among small business owners with and without any felony convictions. The results show that small business owners with a felony conviction are 1.8 percentage points or 20 percent less likely to receive a government or bank loan for start-up capital, compared to small business owners without a felony conviction. In contrast, small business owners with a felony conviction do not significantly differ in their likelihood of using personal or family savings/non-savings or credit cards as their source of start-up capital.²³ Small business owners are 1.4 percentage points (22 percent) more likely to report other sources used for start-up capital than those without a felony conviction. These results provide supportive evidence that individuals with felony convictions not only face credit barriers in sustaining and growing their businesses, but also at the nascent stages of starting a new business - which can likely impact the types, industry, and growth aspiration of their businesses as well.

In Panel B, we document whether owners with and without a felony conviction differ in the financial resources used to expand and grow their businesses, by comparing the four sources of expansion capital —personal or family savings/non-savings, government or bank loan, credit card, or other source— among small business owners who reported a need for expansion capital. We find that small business owners with a felony record are 1.5 percentage points or 21 percent less likely to receive a government or bank loan for expansion capital, compared to other small business owners. We also find that business owners with felony convictions are 1.32 percentage points or 73 percent more likely to report they had no access to financial capital to pursue their business expansion. This provides supportive

²¹Visualizations of these differences are provided in Appendix Figure A1. We report the unadjusted differences in Appendix Table A3 and Appendix Figure A1).

²²These differences are shown in Appendix Table A2.

²³Throughout this section, we discuss the point estimates bench-marked to the non-felony conviction control mean. All point estimates throughout this paper have been formally tested at the conventional level of 10%, 5%, and 1%, and reported differences in the text are statistically significant at these levels. Percent changes throughout this section are produced by the point estimate divided by the non-felony control mean of the outcome.

evidence for the credit barriers that individuals with felony convictions face. They are also 2.2 percentage points (4 percent) less likely to source their expansion capital from personal or family savings/non-savings and 2.6 percentage points (14 percent) less likely to source their expansion capital from credit cards, compared to those without felony convictions. Small business owners with a felony record are 0.46 percentage points (3 percent) more likely, albeit not at a statistically significant level, to use other sources to obtain expansion capital than those without a felony conviction, which may include payday lenders, off-market loans, or any other source that is not already explicitly asked categories (e.g., money from self, from family, etc.). These descriptive results suggest that small business owners with felony convictions face credit barriers in accessing capital to grow and sustain their businesses, particularly in securing government or bank loans, even conditional on business age and total revenue.

Finally, we turn to the ability to sustain a business, which is most closely tied to the subsequent causal analysis. Panel C compares the reported reasons for ceasing operations among the small business owners who have closed their businesses by the time of the survey for those with and without a felony conviction. Small business owners with felony convictions are 4 percentage points (77 percent) more likely to report lack of access to capital as the reason for ceasing operations, compared to those without felony convictions. This result provides supportive evidence for both the lack of access to credit and the importance of access to credit in sustaining business operations for small business owners with felony convictions. Results further show that small business owners with felony convictions are 5.9 percentage points (20 percent) more likely to report low sales as the response for ceasing operations, even after controlling for age of business and total revenue; this finding is in line with prior work that finds small business owners with a criminal record are more likely to be reliant on business income (Finlay, Mueller-Smith, and Street, 2022).

Together, these results suggest a lack of access to formal credit for business owners with felony convictions, and that such a lack of access is leading to smaller businesses and increased failure rates. These results speak to the SBA’s concerns regarding the inability of justice-involved business owners to repay loans due to business failure, suggesting that their perceived lack of creditworthiness may, in part, be attributed to the initial lack of access to credit. Given reasonable endogeneity concerns though, we delve into examining the causal impacts of credit barriers for business owners with felony convictions on entrepreneurial and recidivism outcomes in the next section.

5 Causal effect of credit access for the justice-involved

5.1 Identification strategy and sample definition

To understand the effect of access to credit among small business owners with past felony records, we leverage the discontinuity in eligibility for federal funding through the SBA PPP loan discussed in Section 2.3 in a regression discontinuity design (RDD). Specifically, we compare Schedule C filers barely eligible for the PPP (i.e., has felony conviction older than 60 months) to those barely ineligible (a felony conviction more recent than 60 months) at the start of the first wave of PPP on April 3, 2020. We re-center the cutoff so that our running variable refers to days relative to the eligibility cutoff where Schedule C filers with a felony conviction exactly 5 years prior to April 3, 2020 have 0 days eligible at the start of the PPP funding; those with convictions slightly older than five years have positive days of eligibility, while those with convictions not yet five years old have negative days of eligibility. Throughout the paper, we use 20 months on either side of the cutoff in our baseline model and continually refer to these individuals as marginal, barely eligible or ineligible, and show robustness to this decision in Figure 7 and Appendix Table A6.²⁴ Since marginally ineligible individuals with felony records for the funding at the start or the program will age into eligibility during the first wave of the PPP, we exclude individuals within one month of eligibility in all specifications.²⁵ Ultimately, our results represent the local average treatment effect of PPP eligibility for Schedule C filers with felony records around five years old.

Our goal in this paper is to understand how credit access impacts justice-involved entrepreneurs and the trajectories of their small businesses; it is not to evaluate the efficiency of the design of the PPP inclusion criteria. While anyone with a Schedule C filed in 2019 was eligible to apply for PPP, we aim to restrict our focus to more serious entrepreneurs in order to align with the typical target population considered for business loans from the SBA or other lenders under non-pandemic conditions. To accomplish this, we restrict our attention to two potential sample definitions: (1) Schedule C filers with adjusted gross income exceeding the first kink point in the EITC benefit schedule, and (2) Schedule C filers with positive total revenue reported in tax year 2019.²⁶ The point behind these two complementary sample definitions is to remove those who may have been required to file a Schedule C in

²⁴We chose to present a common bandwidth across outcomes for the main results for consistency and chose 20 months since it is the average optimal bandwidth for our main outcomes.

²⁵We show that our primary results are robust to including these individuals in Appendix Table A7. Additional exclusions are not required since initial funding of the first wave of PPP loans was quickly depleted, only to resume starting in 2021.

²⁶For the former criteria, we exclude Schedule C filers with Adjusted Gross Income (AGI) below 10,370 and 14,570 for those claiming 1 and 2 or more dependents, respectively Tax Policy Center (2024).

2019 or were engaged in potential tax-sheltering activities (Carroll et al., 2000), but were not actually seeking to grow a small business (e.g., small businesses that were already moving towards closing down prior to the PPP or individuals engaged in modest amounts of self-employment to maximize their EITC benefit (Chetty and Saez, 2013; Garin et al., 2024)).²⁷ There is non-trivial overlap between these populations, so they should not be thought of as independent study samples. Throughout, we focus on geographic areas in the top quartile of PPP exposure in the first wave due to the well-documented geographic concentration in initial PPP funding (Granja et al., 2022).

We apply the following model to estimate the causal effects of PPP eligibility on several outcomes of interest:

$$Y_{i,d} = \alpha + \beta I(\text{days after eligibility} > 0)_i + \gamma(\text{days after eligibility})_i + \delta(\text{days after eligibility})_i \times I(\text{days after eligibility} > 0)_i + \mathbf{X}_i + \epsilon_{i,d}$$

where outcomes of interest for individual i with d days of PPP loan eligibility include indicators for receiving a PPP loan (first wave and ever), a criminal conviction (in 9, 12, and 18 months), a conviction of a certain type (violent, income generating, financial, substance abuse, and other), filing a Schedule C in 2021 and 2022, and filing a W-2 in 2021 and 2022. The following additional outcome variables measured in dollars: total Schedule C revenue in 2021 and 2022, total Schedule C payroll bill in 2021 and 2022, and total W-2 earnings in 2021 and 2022. The continuous running variable, $(\text{days after eligibility})_i$, is based on the exact date of the most recent felony conviction, and $I(\text{days after eligibility} > 0)_i$ is an indicator equal to 1 if the individual was eligible for a PPP loan based on days since their last felony conviction. X_i is a vector of observable characteristics. The vector of control variables includes a range of individual, business, employment, and criminal record characteristics: sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with a measure of criminal history in the past ten years, including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. Standard errors are clustered on the running variable (i.e., days relative to eligibility).

The timing of a small business owner’s past felony conviction directly affects their eligibility for PPP loans and subsequently could change their behavior through several mechanisms.

²⁷According to a Federal Reserve Bank Survey of over 4,000 non-employer firms, the firm was the primary job among 67 percent of the business owners. The other respondents worked multiple jobs, with 17 percent reporting that this was the main job and 14 percent reporting that this was their side job.

The first channel is through an immediate change in expectations about their businesses' economic prospects during an uncertain time; news of eligibility is positive for those with felony convictions just over five years, while it is negative for those with slightly more recent felony convictions. Galbiati, Ouss, and Philippe (2021) highlight the importance of news and information surrounding economic circumstances for individuals leaving prison, even conditional on current job availability, on the likelihood they return to prison. Business owners have the option and expectation of credit, even if they choose to wait to secure a loan as their economic reality becomes more certain or are waiting for loan funds to be transferred. The second channel is access to funding itself through the PPP program. Business owners can use the funds to support business operations like paying rent or committed financial obligations (e.g., payments on a work vehicle) to avoid losing capital or insolvency. In June of 2020, the felony restrictions were reduced in scope; however, the initial deadline for funding was at the end of June 2020 (see Figure 1). While the deadline was extended until August of 2020 to allow newly eligible business owners to apply, it was likely not enough time to gather documents and successfully apply, given the short notice, and the PPP funding was not replenished nor were there expectations that it would be replenished. It was not until December of 2020 that the Biden administration added new funding to the PPP program that individuals previously excluded had a meaningful change in expectations around their economic prospects and were able to secure funding through the program. Thus, we think of initial eligibility as changing the expectations and funding levels for close to 9 months.

5.2 Evaluating the validity of the research design

The identifying assumption behind our model is threefold: 1) being on either side of the cutoff is random (e.g., there is no manipulation in time since last felony conviction, and caseload characteristics are smooth through the threshold), 2) the cutoff induces a discrete change in eligibility, and 3) no other policies change at the 60 month mark in the age of one's last felony conviction. These assumptions are plausible in our context.

The capacity for endogenous sorting in this setting was quite limited. While other SBA program criminal history disqualifications left more ambiguity and discretion (e.g., having a pending charge)²⁸, PPP eligibility required a deterministic and verifiable rule based on the time since last felony conviction. Consequently, manipulation is nearly impossible in this context, given the unexpected nature of COVID-19 that led to the Paycheck Protection Program and the five year look-back threshold that determined eligibility. Thus, we expect balance in observable and unobservable characteristics. Figure 2 (Panels A and B)

²⁸An early complaint of the initial restrictions was that it was not clear whether having a pending charge was only relevant for felony, misdemeanor or even criminal traffic offenses or how it would be verified.

and Figure 3 provide evidence consistent with this hypothesis, showing no meaningful discontinuities in caseload density or observable characteristics, including demographic traits, business characteristics, employment histories, criminal records, and supervision status, at the policy threshold for either of our research samples.²⁹

To further test this critical assumption, we also create summary indices of predicted recidivism in 12 months, W-2 filing in 2021, and Schedule C filing in 2021 based on all observable preexisting characteristics tested individually in Figure 3. The goal of the exercise is to ensure that our balance tests of individual traits do not mask some underlying relationship between potential outcomes and the policy variation. To do so, we separately estimate the following OLS equation:

$$Y_{i,d} = \alpha + \beta X_i + \epsilon_{i,d}$$

where $Y_{i,d}$ is the number of convictions in the year following April 3, 2020, likelihood of filing a W2 in 2021, or likelihood of filing a Schedule C in 2021, and X_i is the set of baseline covariates previously referenced. Figure 2 (Panels C and D) and Figure 3 confirm smoothness for each of these composite indices.

The second assumption, that moving across the cutoff has a material impact on PPP loan eligibility, is satisfied by the policy itself; individuals with a felony conviction within the last five years were not eligible for PPP funding, while those with felony convictions five years or older were.³⁰ Given the eventual revisions to eligibility criteria, this discontinuity holds only for the first wave of PPP funding (April 3–June 30). We unfortunately do not have applicant information to show the effect on application behavior, as SBA did not receive this information from partnering financial institutions. Rather, in the next section we show empirically that the eligibility discontinuity had an impact on actual loan receipt.

As geographic areas had heterogeneous exposure to PPP, we expect the assumption of discontinuity in PPP loan eligibility across the cutoff to particularly hold in regions with high exposure to PPP. We focus on geographic areas in the top quartile of PPP exposure in the first wave and conduct a placebo test for the sample of Schedule C filers in 2019 with a felony conviction turning 5 years old around April 3, 2020 in the bottom three quartiles of PPP exposure in the first wave. Given the low exposure to PPP among the geographic areas in the bottom three quartile, we expect to find our main outcomes to be smooth across the five-year cutoff. Our results support this, showing that our outcomes such as PPP receipt in the first wave, Schedule C filing in 2021, payroll bill in 2021, and W-2 filings are smooth

²⁹See Appendix Tables A4 and A5 for detailed information on the magnitude of coefficient estimates, associated standard errors, and control means.

³⁰<https://www.federalregister.gov/documents/2020/06/26/2020-13942/business-loan-program-temporary-changes-paycheck-protection-program-additional-eligibility-revisions>

across the cutoff (Appendix Table A8). We do find that in the Positive Revenue Sample, convictions in 9, 12, 18 months decreases across the cutoff. We interpret this as decreased criminal behavior in response to the expectancy of receiving PPP loans.

Finally, one might be concerned that other treatments may occur exactly after five years have elapsed since one’s last felony conviction. We have already ruled out the most obvious co-occurring treatment, changes in the likelihood of being on probation, in prison, or on parole at exactly five years from the conviction. This could arise in theory given the bunched nature of most correctional supervision sentences resulting from felony convictions. However, it is also possible, that individuals’ labor market options change exactly after five years if employers care only about convictions in the past 5 years. In general, we think this is not likely as many employers ask if an individual has ever been convicted of a felony, and other prominent rules (e.g., clean slate policies) change after criminal record availability after specifically 7 years (Agan et al., 2023).

Nonetheless, we conduct two placebo exercises. First, we use data from the sample of 2019 non-Schedule C filers with a felony conviction reaching the five-year mark around April 3, 2020, to estimate the effect of a felony conviction aging past five years on our primary outcomes (i.e., recidivism and labor market outcomes). Since non-Schedule C filers were not subject to SBA credit access restrictions, we would expect these outcomes to remain smooth across the five-year cutoff. Our results support this expectation, providing evidence that the observed discontinuity in our main outcomes stems from the change in loan eligibility for Schedule C filers rather than from other co-occurring treatments at the five-year cutoff or specific events affecting felony conviction holders at that time (Appendix Table A9).

Second, we use data from the prior calendar year to estimate the effect of a felony conviction reaching the five-year mark on our primary outcomes before the credit access policy was implemented. Specifically, we analyze the sample of Schedule C filers in 2017 with a felony conviction turning five years old around April 3, 2018, and estimate impacts on 12-month convictions and W-2 filing/earnings in 2019. We find that the main outcomes remain smooth across the five-year cutoff for the 2017 Schedule C filers, further supporting that the observed discontinuity arises from the change in loan eligibility rather than from other co-occurring treatments at the five-year cutoff (Appendix Table A10).

5.3 Reduced form findings from the regression discontinuity

Effects on receipt of PPP funding. Figure 4 and Table 2 show the effect of PPP eligibility on first-wave loan receipt. Throughout this and the following sections, we discuss the point estimates derived from our two primary samples, the EITC-exclusion sample and

the positive revenue sample, benchmarked to the average outcome to the left side of the cutoff. We observe consistent and statistically significant increases in PPP loan receipt in the first wave across both of our sample definitions, finding that marginally eligible small business owners were 1.4–1.6 percentage points (65 percent–74 percent) more likely to receive PPP loans.³¹ Admittedly, these point estimates are relatively small in levels. Because we believe eligibility itself could impact future outcomes independent of loan receipt, this should be thought of as a strict lower bound on the size of the marginal population. Section 5.4 provides a more complete discussion of how to think through scaling our RD estimates to measure actual treatment effects. This includes exercises that proxy for loan application behavior itself, which suggests a potential first stage in the range of 4.7–10.6 percentage points depending on the assumptions being made. For now, we proceed with a discussion of the reduced form findings.

Changes to entrepreneurship and labor market outcomes. Research has shown evidence of fraud and waste in the PPP (Beggs and Harvison, 2023; Griffin, Kruger, and Mahajan, 2023). Whether such loans operated in practice as unintended and atypical forms of cash assistance to small business owners or as traditional business loans to support entrepreneurial activity fundamentally alters the interpretation of the policy variation that we study. To explore this issue, we examine the continued likelihood of self-employment in 2021, the year following receipt of potential PPP funds. If business owners treated such funds as disposable income, we may not expect to see a discontinuity in the continued likelihood of business survival. In contrast, if business owners used the credit as intended through investing in their ongoing entrepreneurship, ongoing self-employment should be more likely among marginally eligible individuals.

Figure 4 and Table 2 show the results of this exercise. Supportive of the latter hypothesis, we observe consistent evidence between our two samples that eligibility increases the likelihood of continued self-employment in 2021 between 1.8–3.8 percentage points (4–8 percent).³² In fact, we observe that the total payroll bill for the small business reported on the individual’s 2021 Schedule C tax forms also shows consistent, significant increases across the discontinuity. The PPP was specifically designed to maintain firm payroll levels

³¹Some individuals to the left of the cutoff can still be legally treated in the first wave as felony convictions age during the first wave and make them eligible with a few weeks left in the first wave of the program. For example, someone with a felony record 45 days from the five-year mark would be eligible June 5, 2020 and could theoretically submit and be approved within our definition of the first wave ending on June 30. It is also possible that some of the initial take up on the left side of the cutoff is due to mismeasurement, particularly in the data linkage process, or fraudulent applications that intentionally misrepresent their criminal histories.

³²While the estimate of 3.8 percentage points is significant at the 5% level using the EITC exclusion sample, the estimate of 1.8 percentage points is not significant at the conventional levels we test for when using the positive revenue sample to define “serious entrepreneurs”.

during the pandemic, and these estimates indicate that for this subpopulation the program was operating broadly as intended. Related, we also find positive but imprecise impacts to total revenue in 2021, across both samples. This pattern of results counters popular concerns that justice-involved business owners are unreliable investments while supporting the hypothesis raised in Section 2.2 that insufficient credit constrains entrepreneurial success in this population.

We also consider impacts to entrepreneurial outcomes continuing in 2022 (see Appendix Table A11), and find positive but imprecise impacts. In our EITC sample, we do find a significant positive impact on payroll bill in 2022. Studying outcomes into 2022 is complicated by the fact that the ongoing integrity of our research design erodes over the longer follow-up period. This is due to two factors. First, those marginally ineligible in April 2020 would have their criminal histories age into eligibility by the start of the second wave of funds in early 2021 if they managed to desist from further criminal activity. Second, the 5-year eligibility rule for felony convictions was removed entirely during the summer of 2020 along with a variety of additional revisions to make the PPP more accessible to justice-involved individuals. This weakening of our experimental variation is partly borne out empirically. The impact on loan receipt within the Positive Revenue shrinks to 1.1 percentage points and loses statistical significance when evaluating if individuals ever received a PPP loan. The impact for the EITC Exclusion sample similarly contracts to 2.0 percentage points when evaluating ever receiving a PPP loan, although this remains statistically significant. Regardless, the sizable catch-up within the control group is apparent considering that control means rise to close to 10 percent for ever receiving a PPP loan, which is over four times the rate of first-wave loan receipt.

In addition to entrepreneurial activity, we also study how PPP eligibility changed individuals' likelihoods of engaging in paid employment on the labor market. Figure 5 Panel B shows a distinct drop in paid employment, which we defined as $>\$1,000$ in W-2 reported earnings, in 2021 that ranges between -3.7 and -5.0 percentage points (8–11 percent) depending on the specific research sample. This pattern is also reflected in W-2 earnings in 2021, where we find a significant drop in W-2 earnings that ranges between $\$1,299$ to $\$2,027$ (10–13 percent) depending on the specific research sample. We examine these paid-employment outcomes continuing in 2022, and we find both the decreases in W-2 filing and W-2 earnings to remain consistent but largely imprecise (except the significant decrease of W-2 filings in 2022) (see Appendix Table A11). We interpret these results to indicate that as marginally eligible justice-involved entrepreneurs renew their focus on their small businesses in light of access to government-provided business loans, they are less likely to have time or need for paid employment.

Impacts on future criminal behavior. Despite ample evidence that paid employment can lower recidivism, Deshpande and Mueller-Smith (2022) highlight how reductions in employment and crime outcomes can occur simultaneously in response to available alternative income sources. A similar logic may apply to our setting. While prior work studies traditional cash assistance program, we examine a different alternative to paid employment, entrepreneurship and self-employment facilitated by PPP access, which also may relieve financial pressures for these individuals. Since we see a decline in paid employment, which suggests improved self-sufficiency, it is natural to question whether criminal activity also changed.

Figure 6 shows a clear reduction in the 12 month likelihood of a future criminal conviction, with point estimates ranging from -1.0 to -0.7 percentage points (53–44 percent) in our two research samples. This reduction is robust to measuring recidivism over 9 month and 18 month follow-up periods, and appears to be driven by statistically significant reductions in violent crimes, financial crimes, and substance abuse-related crimes like driving under the influence or possession of illicit drugs (Appendix Table A12). Changes in violence and substance-abuse behavior may reflect stress responses or coping mechanisms among marginally ineligible entrepreneurs who cannot secure financing in response to a major economic shock. Such behavior would impose significant negative externalities on individuals’ families and communities, significantly lowering overall social welfare. The receiving or knowing that one could access PPP funding may have relieved the significant strain faced by marginally eligible individuals during this period of economic uncertainty, thereby reducing the likelihood of turning to antisocial behaviors.

The change in financial crimes similarly connects back to potential desperation-related socially sub-optimal responses among marginally ineligible entrepreneurs. We do not believe the reduction in financial crimes to be mechanical in nature (i.e., control group members had higher fraud convictions because they were caught lying on their PPP loan applications), since the COVID-19 Fraud Enforcement Task Force was only established in May 2021, which falls after the 12-month window of our main outcome period. Instead, the SBA’s initial criminal history restrictions, which were intended to prevent fraud in the PPP, appear to have had the opposite impact.

More broadly, our findings are consistent with a larger literature about job loss and criminal activity (Bennett and Ouazad, 2019; Britto, Pinotti, and Sampaio, 2022), wherein business closure can be thought of as the loss of self-employment. These results though are not consistent with evidence that providing cash assistance encourages criminal activity (Carr and Packham, 2021; Abdelrahman and Schnepel, 2021; Dobkin and Puller, 2007). In addition, these findings raise potential nuances regarding theories of turning points and

desistance in crime (Laub and Sampson, 1993; Bushway and Paternoster, 2013), given that our research sample is comprised of individuals who have spent years without a new criminal offense and started small businesses, two factors that should strongly predict no further contact with the justice system. Yet, our findings suggest that even with these advantages, such individuals still may be on the cusp of becoming justice-involved once more.

Robustness checks. Throughout the paper, we use a baseline model that includes 20 months on either side of the cutoff, a 30-day donut, uniform weights, and a linear functional form. Our findings, however, are robust to variations in bandwidth, donut size, weights, and functional form. Our main results are consistent across different bandwidth choices (Figure 7 and Appendix Table A6), using bandwidths of 6, 12, 18, 20, 24, 30, and 36 months on either side of the cutoff. We also confirm robustness to donut exclusions (Figure 7 and Appendix Table A7, Models 1–5) by testing specifications with no donut, as well as 15-day, 30-day, 45-day, and 60-day donuts. Finally, we assess robustness to alternative weighting and functional form choices (Figure 7 and Appendix Table A7, Models 6–9), including triangle weights, Epanechnikov weights, a quadratic functional form, and a local linear functional form. These variations do not alter the bottom-line conclusions resulting from this natural experiment.

Heterogeneity analysis. Given significant differences by race in both the criminal justice system and labor markets, we explore subgroup heterogeneity across this dimension by splitting the sample into white and non-white subgroups. One reason we may expect racial heterogeneity is differential success in securing PPP loans. For example, prior work has documented that Black small business owners were less likely to receive PPP loans because of fewer pre-existing banks relations (Atkins, Cook, and Seamans, 2022), which are thought to be vital for credit access in general (Berger and Udell, 2002). Additionally, potential racial discrimination from lenders may have decreased the likelihood of eligible Black entrepreneurs for receiving funds (Chatterji and Seamans, 2012; Atkins, Cook, and Seamans, 2022), or discouraged them from applying in the first place (Fairlie, Robb, and Robinson, 2022). Finally, prior research has shown that Black individuals are less likely to have other alternative resources, such as family wealth, in the face of negative shocks compared to White individuals (e.g., Blau and Graham, 1990; Ganong et al., 2020), potentially changing the role of PPP eligibility across White and Black business owners.

In Panels A and B of Appendix Table A13, we show that marginally eligible White business owners were 1.5 and 1.8 percentage points, or 66-74%, more likely to receive a PPP loan in the first wave for the positive revenue and EITC exclusion samples, respectively.

White filers were 0.8-0.9 percentage points (62-64 percent) less likely to have a criminal conviction in the next 12 months, 2-3 percentage points (5-7 percent) more likely to be self employed in 2021, and 4.5 percentage points (10-12 percent) less likely to work for another employer.³³ We find similar results for non-white filers in Panels C and D, although less precisely estimated given that they represent less than one third of our sample. We find that non-white filers are 1.2-1.4 percentage points more likely to receive a PPP loan in the first wave. They have a similar reduction in the likelihood of receiving a criminal conviction compared to their white counterparts, with a 0.9-1.6 percentage point reduction (36-64 percent) in the likelihood of having a criminal conviction in the next 12 months. Non-white filers in the EITC exclusion sample have quite similar estimates to white filers in both samples with an increase in the likelihood of filing a Schedule C in 2021 and a decrease in the likelihood of filing a W-2 in 2021 with near zero estimates for the loosely attached businesses in the non-white positive revenue sample. One potential reason why these results are so similar despite the notable racial differences documented in the literature is that we are not comparing the full population of White filers to non-white filers; all individuals in our sample hold felony conviction records, which may remove some of the documented advantages that White business owners hold relative to their minority peers.

5.4 Scaled treatment effect estimates

So far, we have discussed our results purely in terms of reduced form estimates. We interpret these findings as the impact of program eligibility on loan receipt, labor market, and criminal recidivism outcomes. It is natural, however, to consider scaling these reduced form estimates by a first-stage measure to better quantify the specific magnitudes of the impacts of credit access. Our dual sample approach already acknowledges that our proxy for active entrepreneurs (i.e. 2019 Schedule C filers) is likely too broad, drawing in individuals who would not seek out PPP loans even if given the opportunity, which should bias our estimates towards zero.

In this spirit, Table 2 provides three different scaling criteria for our reduced form estimates. The first approach divides our self-employment, labor market, and recidivism estimates by the change in first wave loan receipt at the discontinuity. It assumes that only loan receipt impacts measured outcomes and that changes to future behavior are concentrated within the loan receipt complier population, which is only about 1.4 to 1.6 percent of our two study samples. The resulting estimates are quite substantial, too large in fact to be plausible. For instance, these results would suggest that loan receipt changes self-employment and

³³These estimates are significant at the conventional levels used throughout the paper except likelihood of filing a schedule C.

paid employment likelihoods by up to 231 and 305 percentage points, which is impossible.

Such patterns suggest that the complier population should be more broadly defined. For example, it is likely that individuals who had applied for PPP assistance altered their behavior in systematic ways over the short-run even if they did not ultimately receive funding in the first wave. For instance, perhaps applying for assistance solidifies one’s identity as an entrepreneur, their commitment to their small business, and their expectation of eventual loan assistance. Unfortunately, due to the decentralized nature of the implementation of the PPP program and the important role of local financial institutions in vetting PPP applicants, we cannot observe loan applications themselves. We do, however, have access to another coincident program that was SBA-administered, the COVID-19 Economic Injury Disaster Loan (EIDL) program. After linking that data with CJARS, we observe that 30 percent of EIDL applicants with felony criminal histories had their applications approved.

If we assume that the EIDL approval rate for justice-involved individuals applies to our entire research sample regardless of the timing of their criminal history, we end up with our second exercise which we refer to as the loan application lower bound. Since there are more loans approved to those with older criminal histories, they will also have proportionally more loan applications. This brings the size of the potential complier population up to 4.7 to 5.4 percent. Scaling our reduced form estimates by this stage still yields certainly large treatment effect estimates, but at least no results are impossible on face value. For instance, now we estimate self-employment and paid employment treatment effects topping out at 69 and 91 percentage points respectively.

Our final exercise acknowledges that approval rates in this sample may be endogenous to the PPP eligibility criteria itself. Stated another way, perhaps the EIDL approval rates only make sense for the PPP-eligible population (i.e. those with convictions older than 5 years), and that marginal applicants with more recent criminal histories would actually forgo completing the PPP application altogether knowing that their loan approval would have been jeopardized anyway due to their disqualifying criminal history, which was very salient for the PPP loan program. We refer to this exercise as the loan application upper bound.

This final exercise suggests that the marginal population may have been as large as 9.7 to 10.6 percentage points. Scaling by this candidate first stage yields treatment effect estimates that are much more realistic, typically about 15% of the treatment effects implied by scaling by first wave loan receipt. That said, even these results would imply significant shifts in the lives of the complier population: self-employment increasing by 19 to 36 percentage points; paid employment decreasing by 38 to 47 percentage points; conviction likelihood within 1 year declining by 7 to 10 percentage points. Such magnitudes indicate that expanding credit

access for justice-involved entrepreneurs could significantly alter their life trajectories.

6 Evaluating the return on investment for justice-involved entrepreneurs

To further assess the productivity of the PPP funding, we calculate the return on investment (ROI) for loan recipients. Specifically, we estimate the return on investment with two measures, revenue growth per (loan) dollar and revenue per (loan) dollar, using the below equations for all Schedule C PPP loan recipients:

$$\begin{aligned} \text{Revenue Growth Per Dollar} &= \frac{(\text{Average Total Revenue}_{2021,2022} - \text{Total Revenue}_{2019})}{\text{PPP Loan Amount}} \\ \text{Revenue Per Dollar} &= \frac{(\text{Average Total Revenue}_{2021,2022})}{\text{PPP Loan Amount}} \end{aligned}$$

where total revenue is measured from the Business Register and PPP loan amounts from SBA for all Schedule C filers for 2019. We consider first wave recipients who were either marginally eligible, with a felony conviction within 0-20 months of the eligibility cutoff, or did not have any observable felony convictions. This exercise departs from the RD framework since no comparable exogenous variation exists for the general population to measure the causal impact of loan dollars. A drawback to this approach is that non-justice involved entrepreneurs likely are significantly more advantaged in non-observable ways, which would boost their potential ROIs and make them an imperfect benchmark for justice-involved individuals.

With that in mind, Figure 9 presents the distribution of the return on investment using both measures for all Schedule C filers receiving a PPP loan without a felony conviction and those that were marginally eligible to receive the loan (i.e., had a felony conviction between 60 and 80 months prior to the start of the program). Surprisingly, the two groups show similar distributions for revenue growth per dollar (Panel A), ranging from -9.94 to 7.84, with an average of -0.81 for non-felony PPP loans and -0.72 for PPP loans to individuals with felony convictions. Since PPP loans were granted during the pandemic to ameliorate the burden from lockdowns, we do not necessarily expect Growth per Dollars to be positive since many businesses may not have returned to pre-pandemic levels of operation by 2021 or 2022.

Moreover, we find that the felony conviction sample shows less dispersion and is less likely to be in the top or bottom deciles of ROI. This evidence counters some of the conventional arguments made against providing credit or financial capital for business owners with felony

convictions—that business owners with felony convictions pose riskier investments.³⁴

The revenue per dollar results in Panel B, which do not normalize relative to baseline 2019 revenue levels, show similar distributions between the two groups but with some interesting nuances. Relative to revenue growth per dollar, we find more differences between the two distributions, with an average of 9.74 for loan recipients in the general population compared to 6.36 for those with felony records. Justice-involved entrepreneurs are more likely to be among the bottom deciles of Revenue per Dollar in 2021 and 2022, and less likely to be among the top deciles. This difference between the distribution of the two ROI measures leads to the interpretation that while small business owners with felony convictions have similar rates of revenue growth, the absolute size of the businesses (in terms of revenue) may be smaller, leading to lower rates of revenue per dollar. In other words, small business owners with felony convictions may show lower ROI not due to the lack of growth in their business, but due to the underlying difference in their pre-existing business size compared to other businesses, a feature that is confirmed in Appendix Figure A2.

Appendix Figure A2 also shows the relatively skewed distribution of business sizes among justice-involved small business owners relative to other Schedule C filers regardless of PPP receipt status. The smaller size of these businesses suggests a potential important friction with the current portfolio of loan products available from SBA, which traditionally target larger businesses.³⁵ To quantify this, we link Schedule C filers between 1994 and 2017 with the universe of contemporaneous SBA loan approval data for the 7(a) and 504 loan programs.³⁶ While we find that ever securing a 7(a) or 504 loan is rare in the general population of Schedule C filers without criminal records, at 0.06 percent and 0.004 percent respectively, these loan rates are 2 to 3 times larger than the rates for justice-involved entrepreneurs.³⁷

The inherent difference in the size of businesses owned by individuals with and without felony convictions may be driven by the credit access barriers faced by justice-involved entrepreneurs. However, this difference in business size also highlights a potential opportunity for SBA in developing smaller-sized loans that target smaller businesses, which are disproportionately represented by business owners with felony convictions. Efforts to increase smaller size loans, along with revised eligibility criteria, may contribute to diminishing the barriers

³⁴See: <https://www.arnoldventures.org/stories/banks-wont-even-talk-to-us-business-owners-with-a-crimin>

³⁵For example, the minimum and average loan amounts for two most common SBA loans, the 7(a) and 504 programs, in fiscal year 2023 were \$30,000 minimum/\$479,685 average and \$125,000 minimum/\$1,083,622 average respectively. Source: “7(a) & 504 Summary Report.” U.S. Small Business Administration. Accessed on November 8, 2023.

³⁶Years 1996 and 1997 are excluded from this exercise because of limitations in the availability of the tax data.

³⁷Specifically, we find that 0.03 percent and 0.0014 percent of Schedule C filers with preexisting felony convictions ever received 7(a) or 504 loans from the SBA respectively.

to credit for justice-involved individuals and amplify the associated benefits associated with supporting small business owners with criminal histories documented in this paper.

7 Discussion and conclusion

This study stands at the forefront of examining credit barriers faced by justice-involved individuals who pursue entrepreneurship. Using a unique dataset that combines administrative records and micro-survey data, our study enriches our understanding of entrepreneurship as a feasible career alternative for justice-involved people. This paper brings to light the critical credit challenges that justice-involved individuals face and their repercussions on recidivism and business outcomes, providing key insights for researchers and policymakers on how to rethink entrepreneurship as a pathway to reintegration for the justice-involved population.

Our paper reveals credit access disparities for entrepreneurs with felony convictions, marking a significant expansion of the dialogue around the labor market hurdles confronting justice-involved individuals to include the realm of self-employment. Previous research and policies have largely concentrated on overcoming employment barriers within conventional wage-based roles, leading to improvements in employment for justice-involved individuals. However, our findings expose a critical, yet previously underexplored, barrier—the struggle to secure entrepreneurial financing. We demonstrate that these financial constraints not only heighten the risk of reoffending but also diminish the engagement in and reliance on entrepreneurship as a sustainable livelihood option for justice-involved individuals. The difficulty in accessing credit effectively limits their entrepreneurial endeavors, closing off a potentially rewarding path for economic self-sufficiency and societal reintegration in the face of employment discrimination.

These findings suggest that without addressing such credit barriers to entrepreneurship, the viability of entrepreneurship as an alternative pathway for justice-involved individuals remains in jeopardy. Given the importance of entrepreneurship for justice-involved individuals, our results highlight the importance of mitigating entrepreneurial credit barriers for this population. The SBA has made recent policy changes aligned with mitigating credit barriers for justice-involved individuals. In addition to expanding access to PPP loans to those with felony convictions, the SBA has more recently proposed new regulations that would significantly narrow the role of criminal histories for applicants across all loan programs.

Moreover, SBA’s broader purposes and goals of their loan programs—to increase business diversity and address “persistent inequities in accessing capital to ensure all small business owners can get the funding needed to grow and create jobs for our economy”—can be seen

in their recent movement to increase smaller sized loans to businesses.³⁸ The most common SBA loans, those issued under the 7(a) and 504 programs, have historically offered larger loan amounts that do not target the smaller businesses that are disproportionately owned by minorities such as racial minorities, women, veterans, and, as we document, justice-involved individuals. In response, the SBA has been increasing the share of smaller-size loans within the 7(a) loan program, by announcing nearly 70 percent of the SBA’s 7(a) loan volume (more than 39,000 loans) were “small-dollar” loans of \$350,000 or less, with the program originating 45 percent more loans under \$150,000 in fiscal year 2023 compared to 2021. The SBA has also been increasing its Microloan program, a loan program targeting smaller businesses with smaller-size loans of up to \$50,000. For the 2023 fiscal year, \$87 million in microloan funding went to more than 5,500 small businesses, with 35 percent of loans going to Black-owned businesses and 15 percent of loans going to Hispanic-owned businesses. Based on our results, these modified rules with relaxed eligibility criteria and increasing smaller-sized loans will make SBA programs more accessible to those seeking a second chance, namely justice-involved individuals. Furthermore, given that financial institutions likely follow loan eligibility criteria provided by the SBA, we expect these recent changes may spillover to further mitigation of credit barriers for justice-involved entrepreneurs beyond the SBA loan programs to private financial loans.

While our study focuses on the SBA’s Paycheck Protection Program (PPP) loans as an opportunity to causally study the effects of financial barriers encountered by justice-involved entrepreneurs, it is important to evaluate the broader applicability of our findings to other credit obstacles beyond the PPP framework, given the unique circumstances surrounding the PPP loans during the COVID-19 pandemic. PPP loans were designed with the immediate goal of sustaining businesses through the economic turmoil and enforced shutdowns of the pandemic period; the purpose of these loans is similar to that of the SBA disaster relief loans, although both are quite different from the goals of private lenders.

While the PPP’s objectives align with the overarching aims of other SBA initiatives, we acknowledge the constraints in extending our conclusions to different credit environments. Moreover, given that our analysis is situated at the start of the COVID-19 crisis, the context of the pandemic must be factored into our interpretation of the findings. The pandemic era underscored the acute necessity for financial support among businesses, possibly amplifying the perceived value of credit access in our study. Concurrently, the primary function of such loans during this period was to ensure business continuity rather than to foster expansion, which may account for the small observed impact of PPP loans on business revenue growth. The fact that most PPP loans were eventually forgiven perhaps even connects our findings

³⁸Source: <https://www.sba.gov/article/2023/11/21/sba-announces-biden-harris-administrations-progress-s>

more to other SBA programs and proposed legislation to encourage entrepreneurship (e.g., New Start Act 2023) rather than credit access specifically. This nuanced perspective suggests the importance of considering both the specifics of the PPP loan program and the broader economic conditions induced by the pandemic when assessing the implications of our findings on the significance of financial credit access for business owners.

Consequently, future studies should broaden the scope to identify and analyze credit barriers facing justice-involved entrepreneurs that extend beyond PPP and other SBA loan programs more generally. Additionally, there is a critical need for in-depth exploration into how access to credit impacts both business outcomes and recidivism rates. This includes unpacking the underlying processes, such as variations in loan application behaviors and approval rates, to fully understand the relationship between credit access and its effects on this unique entrepreneur demographic.

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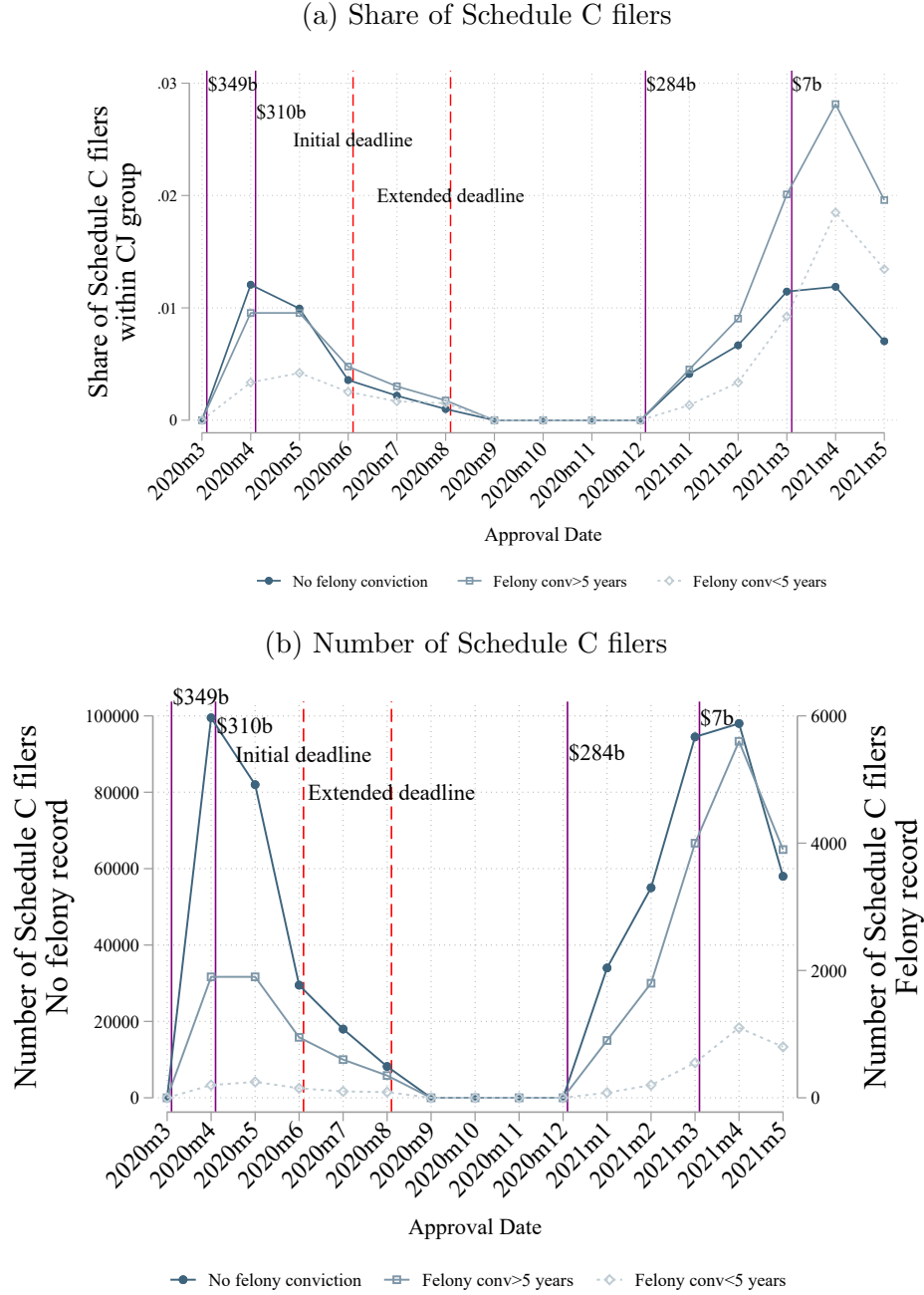
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8 Figures

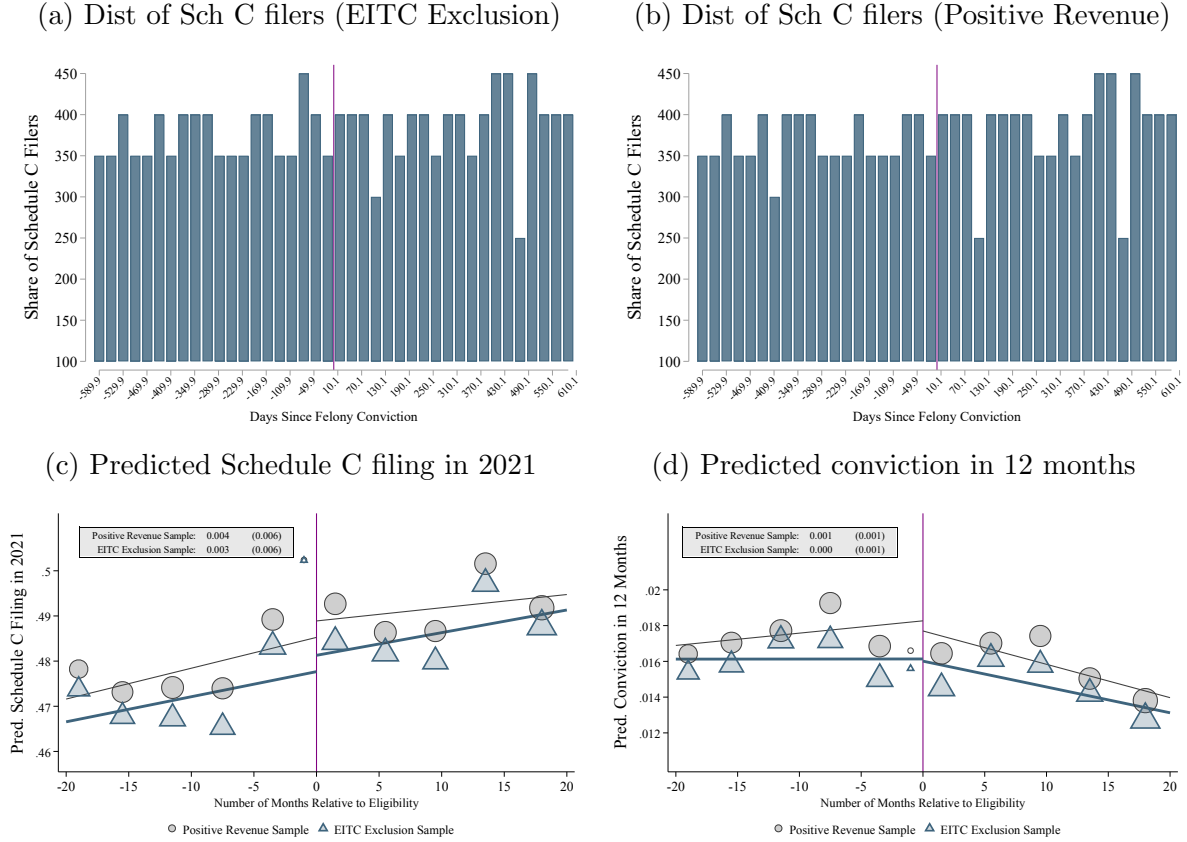
Figure 1: Share and Number of Schedule C filers receiving PPP loans overtime by criminal histories



Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file), SBA Paycheck Protection Program loan data, and Census Best Race Files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all schedule C filers in 2019 in CJARS-covered states. Panel (a) and (b) report the share and number of Schedule C filers receiving an SBA PPP loan for Schedule C filers in the 2019 tax year based on three criminal history groups. Criminal history groups are no-felony convictions, felony convictions older than 5 years as of the given year, and felony convictions within the past 5 years relative to April 3, 2020.

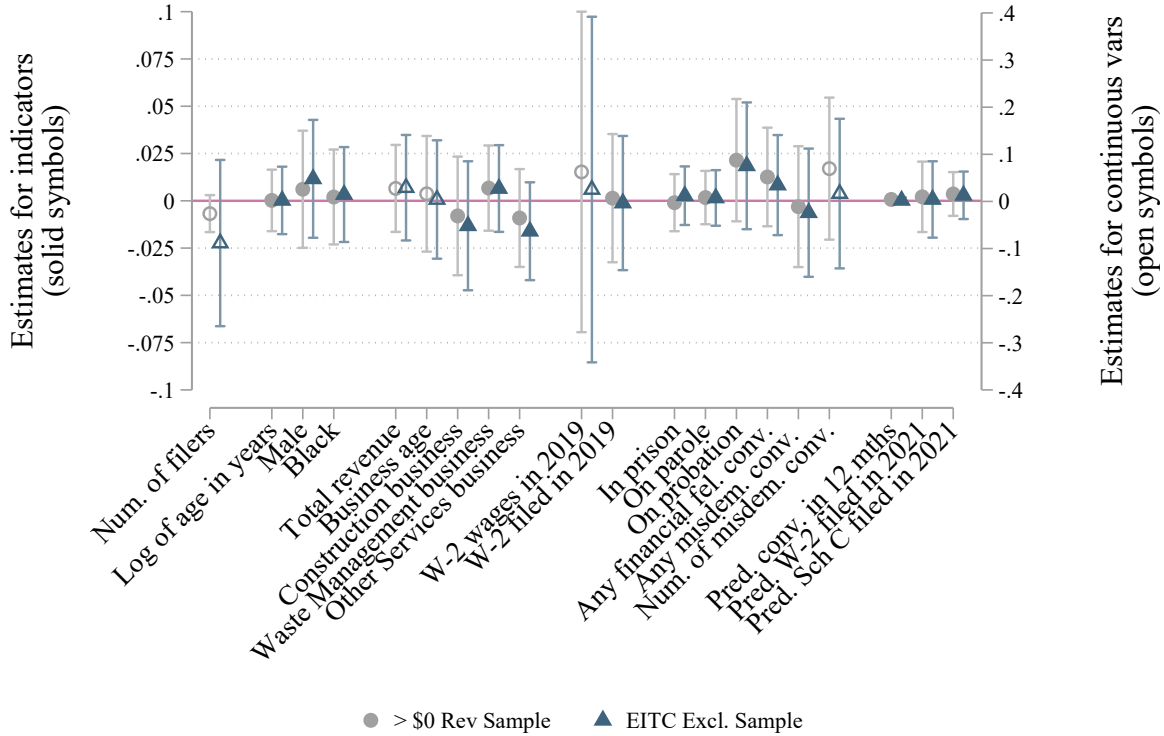
Figure 2: Number and characteristics of Schedule C filers in high-exposure PPP areas relative to age of last felony conviction



Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file), SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). In Panel (a) and (b), observations are only included if they are within 20 months of the cutoff on either side. In Panel (c) and (d), observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

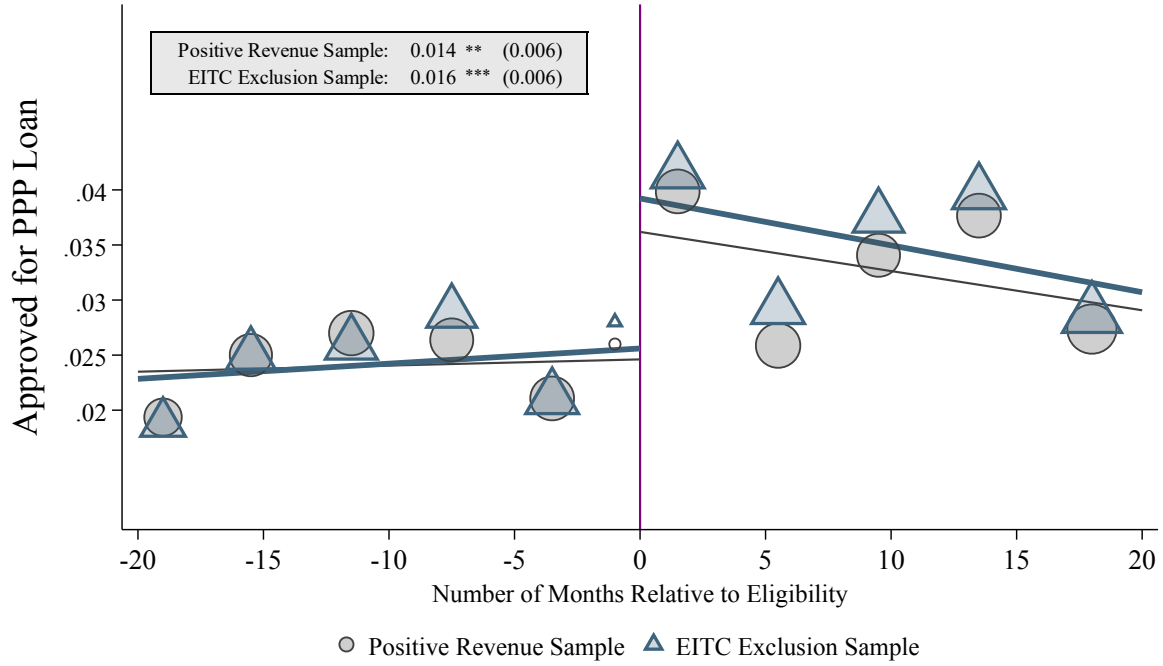
Figure 3: Balance among baseline characteristics



Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file) SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). Observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction. Results are also in Appendix Tables A4 and A5.

Figure 4: Receipt of First-Wave PPP Loan

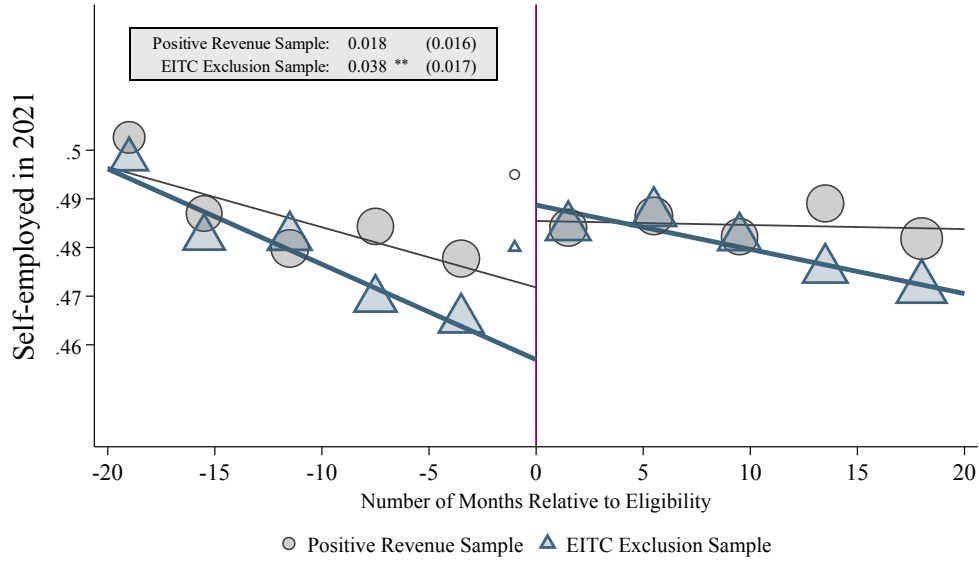


Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file) SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

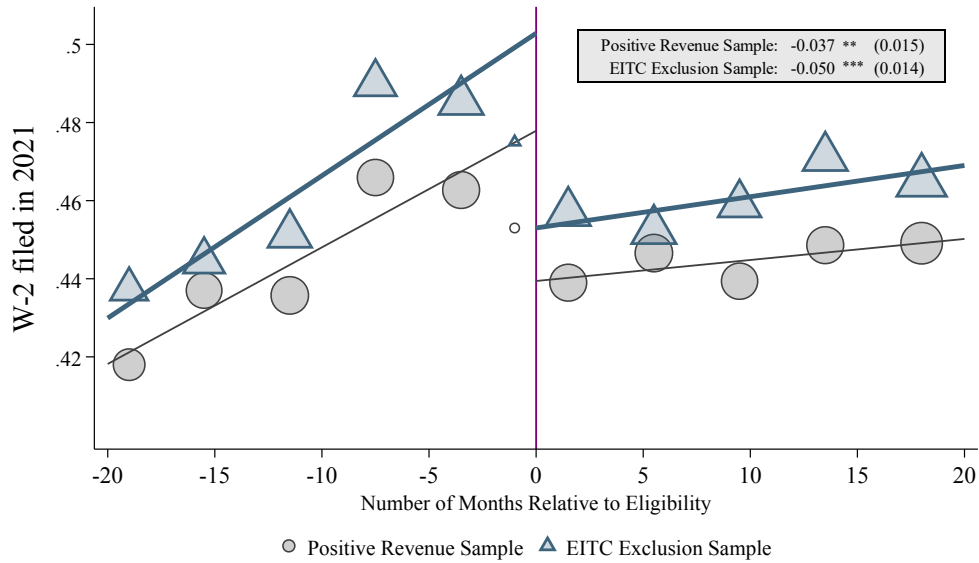
Notes: The sample includes all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). Observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

Figure 5: PPP eligibility and entrepreneurship/paid-employment

(a) Self-employment in 2021



(b) Paid-employment in 2021

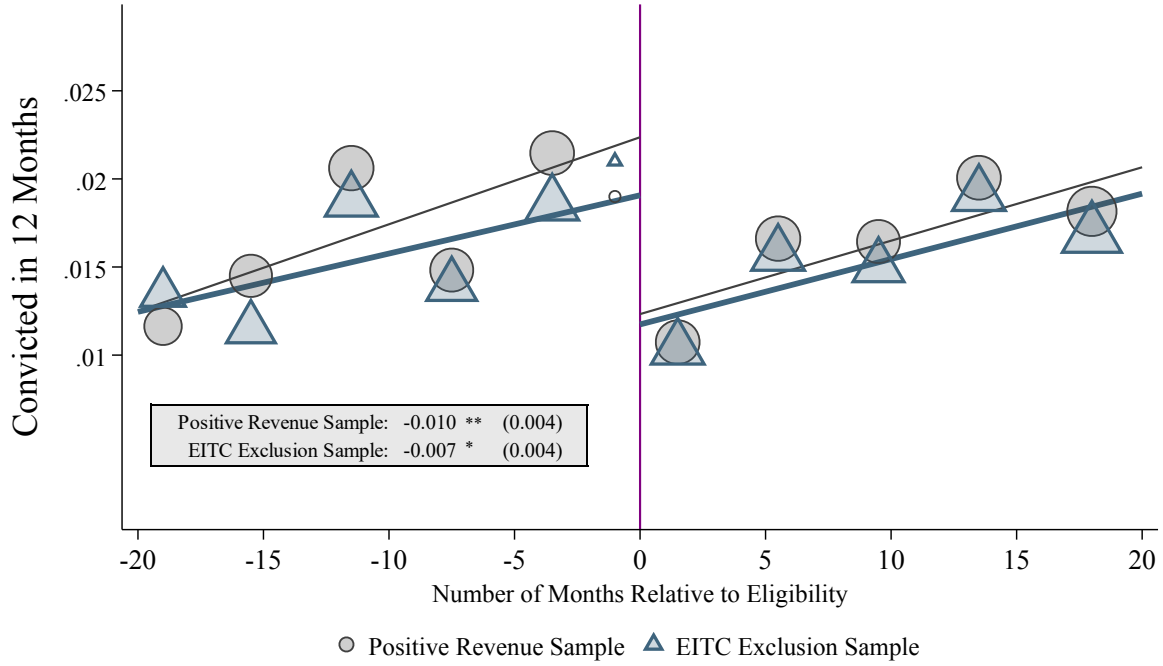


Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file), SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). Observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to -1 days.

Paid-employment is defined as W-2 earnings in excess of \$1,000. Standard errors are clustered by days since the last conviction.

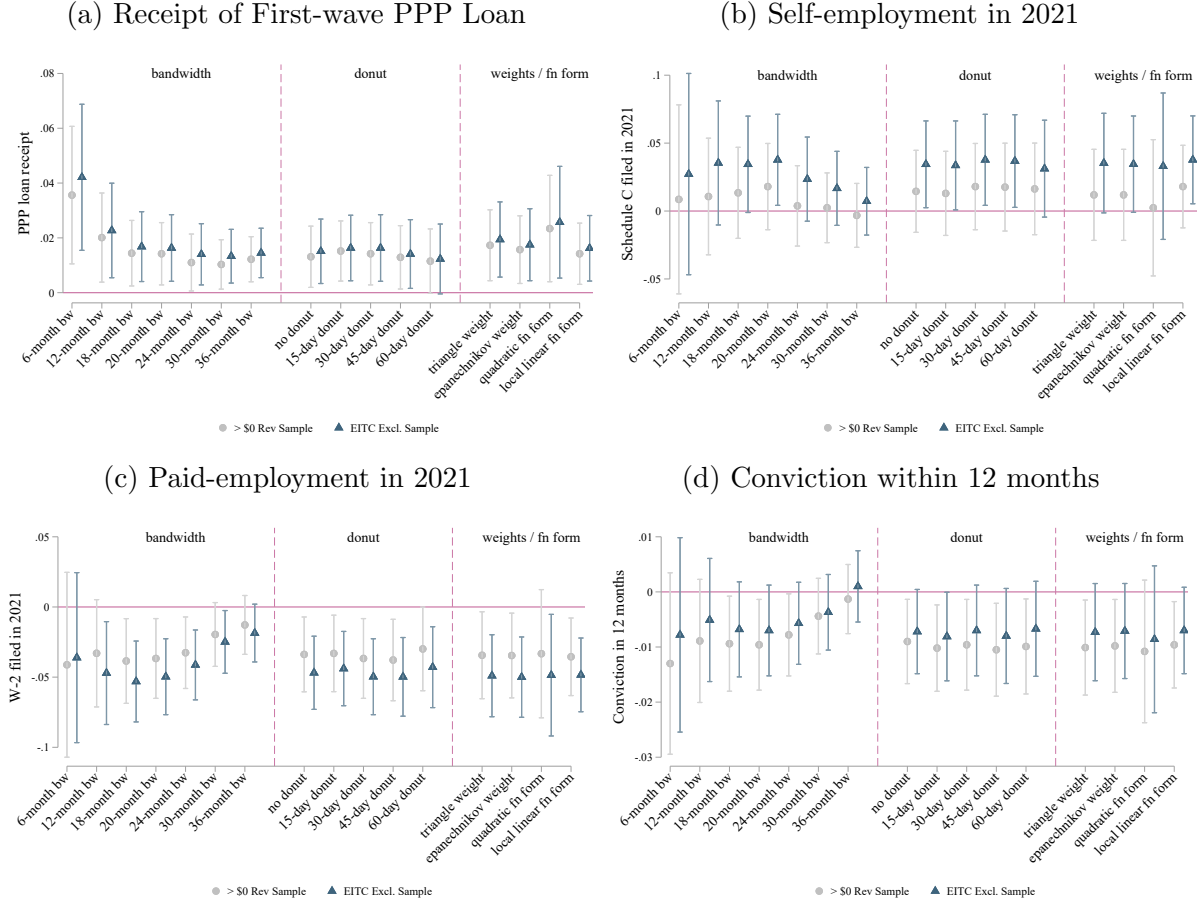
Figure 6: PPP eligibility and likelihood of new conviction within 12 months



Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file), SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). Observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

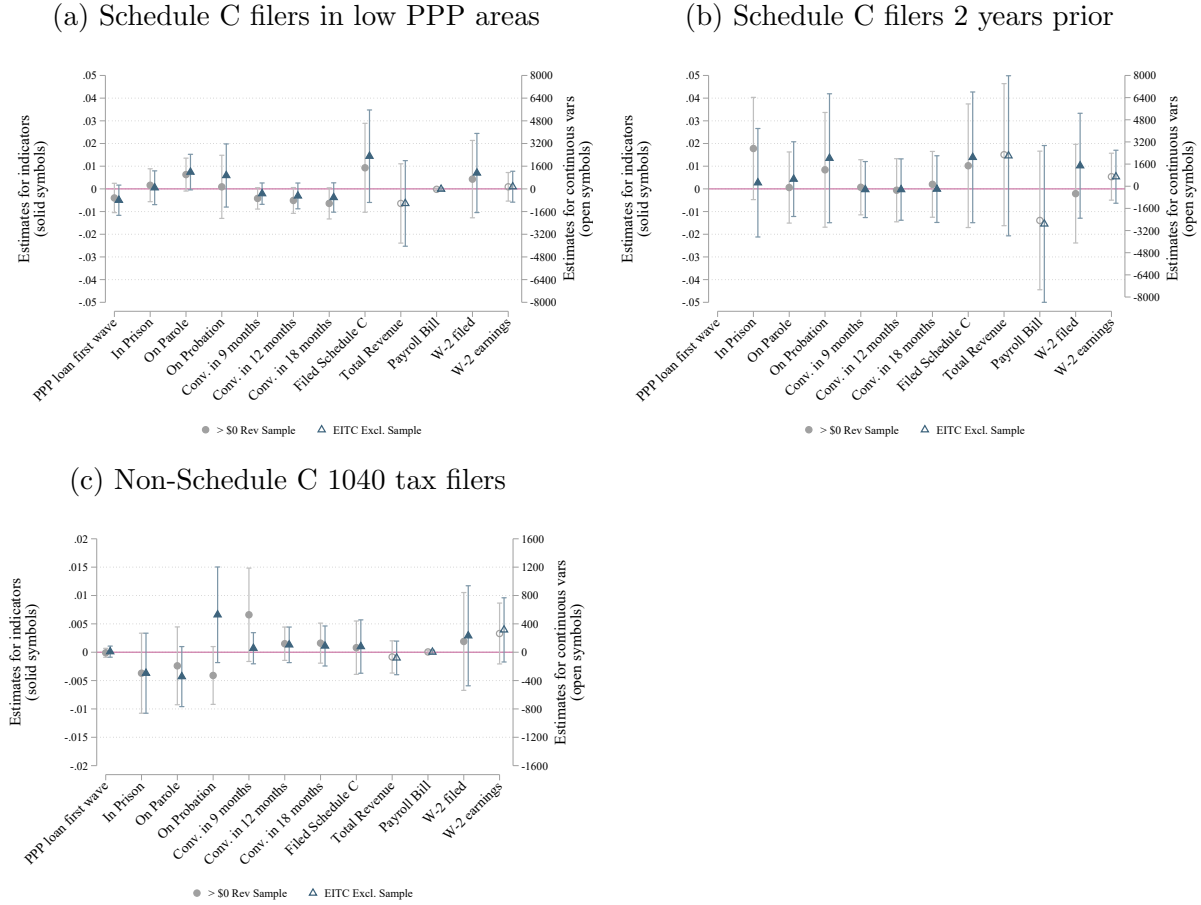
Figure 7: Robustness to specification



Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file), SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). The baseline specification uses observations within 20 months of the cutoff on either side, except for the donut from -30.25 to 1 days, weighted uniformly and controlling linearly for the running variable on either side of the cutoff. Alternative specifications vary the bandwidth in 6-month increments, the donut in two-week increments, the weighting to either triangular or epanechnikov, and the functional form to quadratic or local linear. Standard errors are clustered by days since the last conviction. Results are also in Appendix Tables A6 and A7.

Figure 8: Placebo exercises

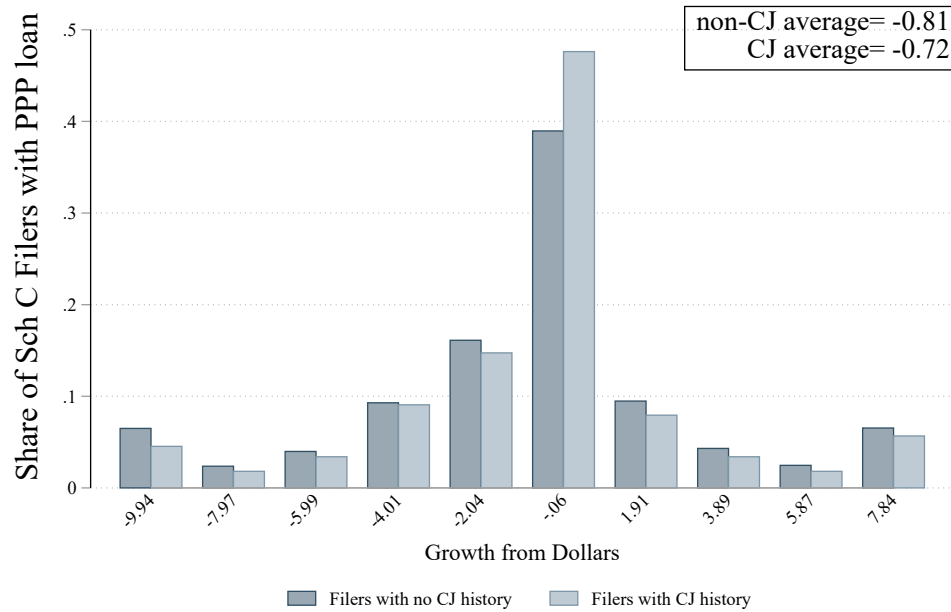


Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file), SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

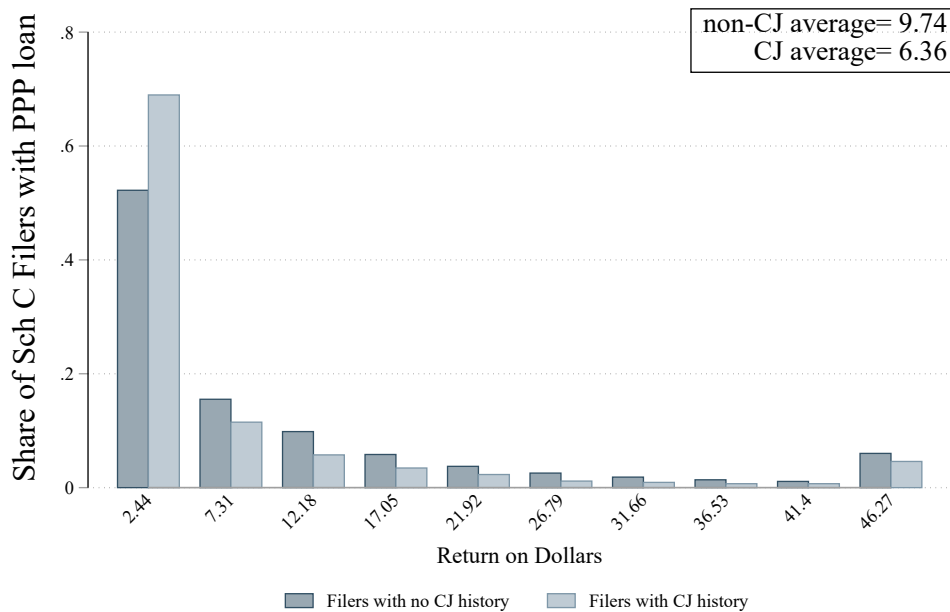
Notes: The sample in Panel A is all Schedule C filers in the 2019 tax year in low PPP exposure counties, defined as the bottom three quartiles. The sample in Panel B includes all Schedule C filers in the 2017 tax year in high PPP exposure counties, defined as the top quartile. The sample in Panel C includes all non-Schedule C tax filers in 2019 in high PPP exposure areas. The baseline specification uses observations within 20 months of the cutoff on either side, except for the donut from -30.25 to 1 days, weighted uniformly and controlling linearly for the running variable on either side of the cutoff. Standard errors are clustered by days since the last conviction. Results are also in Appendix Tables A8, A9 and A10.

Figure 9: Distributions of Returns on Investment for PPP loans

(a) Growth on dollars



(b) Return on dollars



Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019, 2021, and 2022 SSNunits file), and SBA Paycheck Protection Program loan data. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in the 2019 tax year who received a PPP loan that either did not have a felony conviction or were marginally eligible (conviction within 20 months of the eligibility cut off). Standard errors are clustered by days since the last conviction.

Table 1: Differences in reported start-up capital, expansion capital and reason for closing among Schedule C filers

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Start-up capital source						
	Personal or family savings/non-savings	Gov't or bank loan	Credit card	Other source		
I(Felony conv)	0.0031 (0.0065)	-0.0180*** (0.0046)	-0.0014 (0.0066)	0.0136** (0.0052)		
N	285,000	285,000	285,000	285,000		
Outcome mean for non-CJ	0.865	0.09	0.145	0.067		
Panel B: Expansion capital source						
	Personal or family savings/non-savings	Gov't or bank loan	Credit card	No access to capital	Other source	
I(Felony conv)	-0.0219*** (0.0059)	-0.0152*** (0.0032)	-0.0256*** (0.0049)	0.0132*** (0.0027)	0.0046 (0.0049)	
N	243,000	243,000	243,000	243,000	243,000	
Outcome mean for non-CJ	0.501	0.073	0.179	0.018	0.144	
Panel C: Reason for ceasing operations						
	Low sales	Lack of access to capital	One-time event	Sold or started another business	Retired or deceased	Other reason
I(Felony conv)	0.0585*** (0.0125)	0.0395*** (0.0083)	-0.0266*** (0.0070)	-0.0100+ (0.0059)	-0.0265*** (0.0061)	-0.0011 (0.0126)
N	97,000	97,000	97,000	97,000	97,000	97,000
Outcome mean for non-CJ	0.288	0.051	0.107	0.072	0.163	0.444

Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file), SBO survey (waves 2002, 2007, 2012), Census Numident, and Census Best Race Files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is a pooled cross-section of all Schedule C filers responding to the SBO survey in the 2002, 2007, and 2012 waves, weighted using survey weights. The SBO survey samples exclude Schedule C businesses with less than \$1,000 in receipts for all industries except construction and more than \$1 million in receipts. Respondents that have non-responses for all three questions of Startup Capital Source, Expansion Capital Source, Currently in Operations are dropped from the sample. Non-response in the survey is not imputed. Rate of non-response across the groups are similar. The table reports the covariate-adjusted difference in responses for owners with a felony record along with standard errors and the outcome mean for those without a felony record as of the survey year. Controls include: all owner demographics, industry fixed effects, and business characteristics in Appendix Table A2 Panels A, B, and C along with survey wave by business age fixed effects. The unadjusted differences are reported in Appendix Table A3 and these results are visually presented in Appendix Figure A1.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (Throughout the paper, this indicates rejecting the null at the corresponding levels of 10%, 5%, and 1%)

Table 2: Impact of PPP eligibility on first-wave loan receipt, entrepreneurship, paid employment, and criminal activity

	EITC Exclusion Sample (N = 13,000)				Positive Revenue Sample (N = 14,500)			
	<i>Implied Two Stage Least Squares, scaled by:</i>				<i>Implied Two Stage Least Squares, scaled by:</i>			
	<i>Reduced Form</i>	Loan receipt first wave	Loan application, lower bound	Loan application, upper bound	<i>Reduced Form</i>	Loan receipt first wave	Loan application, lower bound	Loan application, upper bound
PPP receipt first wave Sample means = 0.022, 0.022	0.0163*** (0.0062)	0.0163*** (0.0062)			0.0142** (0.0058)	0.0142** (0.0058)		
PPP loan application first wave Sample mean: See notes.			0.0543*** (0.0186)	0.1058*** (0.0177)			0.0473** (0.0174)	0.0967*** (0.0161)
Self employment in 2021 Sample means = 0.471, 0.478	0.0377** (0.0171)	2.31* (1.37)	0.69* (0.39)	0.36** (0.17)	0.018 (0.0162)	1.27 (1.25)	0.38 (0.37)	0.19 (0.17)
Total revenue in 2021 Sample means = \$28,600, \$27,200	3,465 (3,563)	212,577 (233,064)	63,773 (69,162)	32,750 (34,120)	1,503 (3918)	105,845 (279,282)	31,754 (83,654)	15,543 (40,600)
Total payroll bill in 2021 Sample means = \$296, \$278	244.6** (101.4)	15,006* (8,443)	4,502* (2,422)	2,312** (1,034)	223.8** (90.04)	15,761* (9,036)	4,728* (2,579)	2,314** (1,008)
W-2 Filed in 2021 Sample means = 0.467, 0.447	-0.0497*** (0.0138)	-3.05** (1.44)	-0.91** (0.40)	-0.47*** (0.15)	-0.0367** (0.0145)	-2.58* (1.47)	-0.78* (0.42)	-0.38** (0.16)
W-2 Wages in 2021 Sample means = \$15,300, \$13,400	-2.027** (932.1)	-124,356* (74,212)	-37,307* (21,405)	-19,159** (9,375)	-1,299 (894.6)	-91,479 (73,247)	-27,444 (21,442)	-13,433 (9,518)
Conviction within 9 months Sample means = 0.012, 0.013	-0.0065* (0.0037)	-0.40 (0.27)	-0.12 (0.08)	-0.06* (0.04)	-0.0082** (0.0037)	-0.58 (0.35)	-0.17* (0.10)	-0.08** (0.04)
Conviction within 12 months Sample means = 0.016, 0.018	-0.0070* (0.0042)	-0.43 (0.31)	-0.13 (0.09)	-0.07 (0.04)	-0.0096** (0.0042)	-0.68* (0.40)	-0.20* (0.12)	-0.10** (0.05)
Conviction within 18 months Sample means = 0.024, 0.027	-0.0074 (0.0048)	-0.45 (0.34)	-0.14 (0.10)	-0.07 (0.05)	-0.0099** (0.0048)	-0.70 (0.44)	-0.21 (0.13)	-0.10* (0.05)

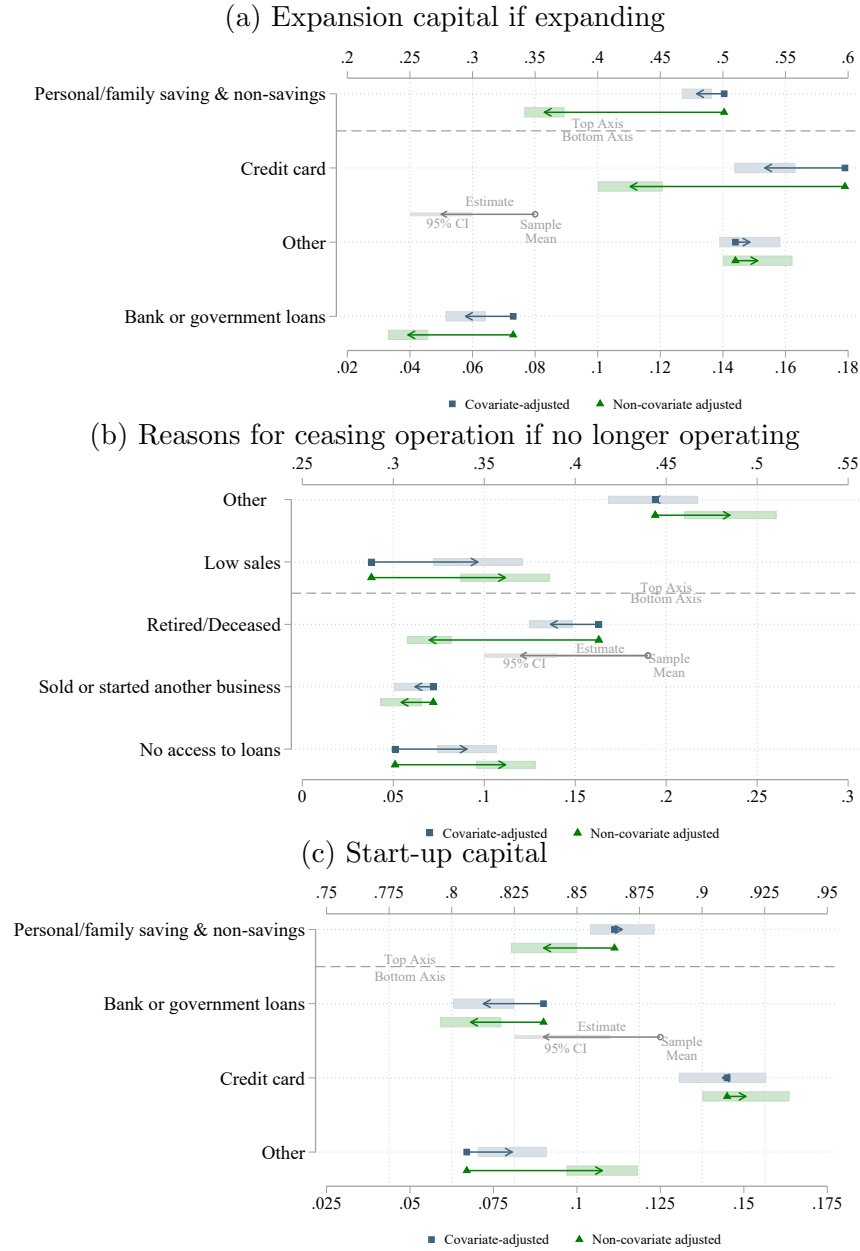
Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with: adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). High-PPP-exposure counties are defined by Granja et al. (2022). Paid-employment is defined as W-2 earnings in excess of \$1,000. Controls include sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with measure of criminal history in the past ten years including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. The bandwidth is 20 months on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors (in parentheses) are clustered by days since the last conviction. Sample means are based on the left side of the cutoff. For loan application means, the lower bound estimate scales all loans received by the 0.30 EIDL denial rate implying a sample mean to the left of the cutoff of 0.073 and 0.073 for the EITC Exclusion and Positive Revenue samples respectively. For the upper bound estimate, the EIDL denial rate is only applied to the right of the cutoff, implying the sample mean to the left of the cutoff is the same as the PPP receipt sample means: 0.022 and 0.022.

* p<0.10, ** p<0.05, *** p<0.01

Appendix A: Supplementary Results

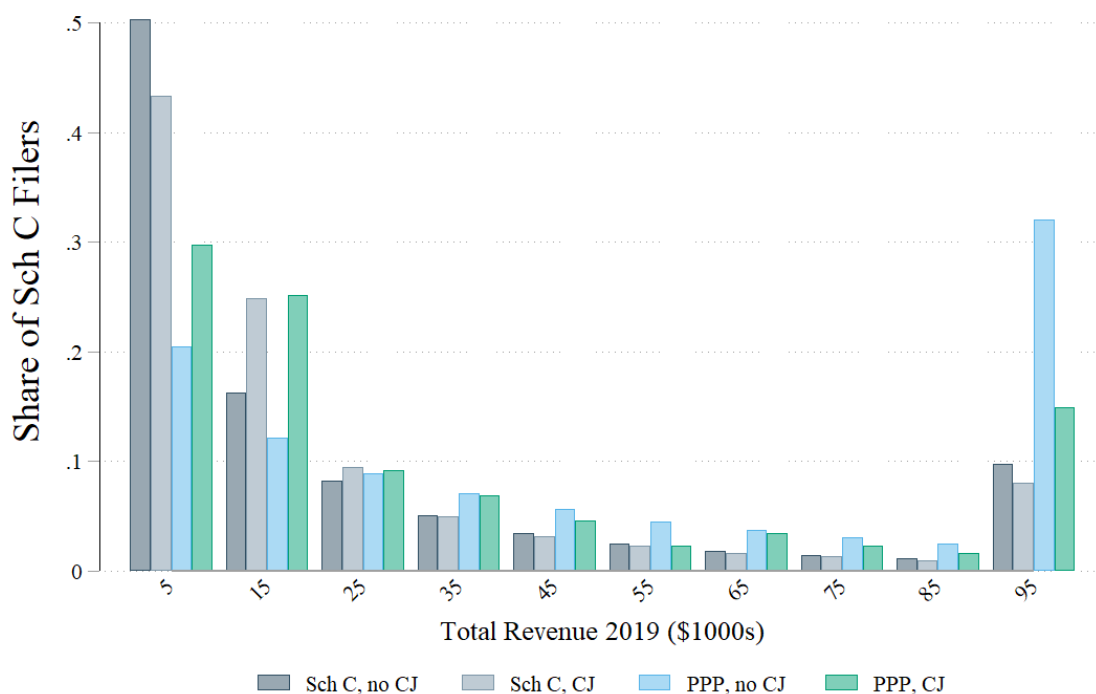
Appendix Figure A1: Reported business operations by felony record status



Source: Authors' calculations from CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file), SBO survey (waves 2002, 2007, 2012), Census Numident, and Census Best Race Files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all Schedule C filers responding to the SBO survey in the 2002, 2007, and 2012 waves, weighted using survey weights. Respondents that have non-responses for all three questions of Startup Capital Source, Expansion Capital Source, Currently in Operations are dropped from the sample. Non-response in the survey is not imputed. Rate of non-response across the groups are similar. The mean for owners without a felony record are plotted with the estimated, covariate-adjusted difference in responses for owners with a felony record along with 95% confidence intervals. Controls include: all owner demographics, industry fixed effects, and business characteristics in Appendix Table A2 Panels A, B, and C along with survey wave by business age fixed effects.

Appendix Figure A2: Distribution of 2019 total revenue for Schedule C filers by criminal histories



Source: Authors' calculations from CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file), SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in the 2019 tax year in CJARS-covered states. Groups are Schedule C filers with no felony convictions, Schedule C filers with felony convictions, Schedule C filers who received a PPP loan with no felony convictions, and Schedule C filers who received a PPP loan with a felony conviction.

Appendix Table A1: Most common offenses within conviction type categories

Violent	Substance abuse	Income generating	Financial	Other
Aggravated assault	Driving under the influence of alcohol	Forgery/Fraud	Forgery/Fraud	Criminal traffic
Extortion/threat	Possession/use of marijuana	Theft, Value Unknown	Commercialized vice	Obstruction/resisting
Armed robbery	Possession/use of unspecified drug	Burglary	Financial crimes	Disorderly conduct Offense
Simple assault	Drug paraphernalia	Destruction of property	Taxation offense	Weapons offense
Violent offense other	Other drug offense	Criminal trespass	Forgery/fraud, conspiracy	Not known/missing
Child molestation	Driving while intoxicated	Petty theft ($\leq$ \$500)	Bribery/conflict of interest	Public order offense, other
Child Abuse	Possession/use of cocaine or crack	Distribution, drug unspecified	Financial crimes conspiracy	Liquor law violation
Rape	Possession/use of controlled substance	Grand theft ($>$ \$500)	Commercialized vice, attempted	Other court offense
Murder	Possession of amphetamines	Distribution marijuana	Commercialized vice, conspiracy	Contempt of court/violate court order
Kidnapping	Possession/use of heroin	Distribution cocaine or crack	Financial crimes attempted	Probation violation

Source: Authors' calculations from CJARS vintage 2022Q4. Not estimated using Census Bureau data.

Notes: The ten most common offenses in each category within all CJARS data are listed for clarity as to the type of offenses in each grouping. All categories are mutually exclusive except Financial offenses, which are a subset of Income Generating offenses.

Appendix Table A2: Differences in characteristics for SBO filers with and without a felony record

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Demographics										
	White	Black	Hispanic	Asian, Native American or Pacific Islander	Male	Owner age	High school or higher	Bachelors degree or higher	Missing education	Missing owner age
Felony	-0.073*** (0.005)	0.077*** (0.004)	0.091*** (0.005)	-0.012*** (0.0017)	0.0998*** (0.0058)	-6.65*** (0.135)	-0.057*** (0.0047)	-0.196*** (0.0031)	0.012*** (0.0034)	-0.0002* (0.0001)
N observations	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000
Panel B: 2-digit NAICS										
	Agriculture/Forest/ Fishing/Hunting	Mining	Utilities	Construction	Manufacturing	Wholesale and Trade	Retail	Transportation and Warehousing	Information Systems	Finance and Insurance
Felony	0.005*** (0.0015)	-0.0023*** (0.0008)	0.0001 (0.0004)	0.152*** (0.0057)	-0.0020 (0.0013)	-0.0007 (0.0015)	-0.023*** (0.0031)	0.035*** (0.0034)	-0.0054*** (0.0009)	-0.026*** (0.0014)
N observations	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000
Outcome mean for non-felony	0.012	0.008	0.001	0.119	0.017	0.019	0.103	0.047	0.013	0.042
	Real Estate and Renting/Leasing	Professional, Science, or Technical Services	Waste Management	Education	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services		
Felony	-0.033*** (0.0022)	-0.095*** (0.0030)	0.023*** (0.0039)	-0.017*** (0.0010)	-0.022*** (0.0029)	-0.028*** (0.0018)	-0.0015 (0.0013)	0.04*** (0.005)		
N observations	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000		
Outcome mean for non-felony	0.063	0.17	.08	0.026	0.08	0.055	0.013	0.131		
Panel C: Business characteristics										
	Business age	Receipts in \$1000s	No start-up capital needed	No expansion needed	Currently operating	Missing the business age	Missing whether start-up capital was needed	Missing whether expansion was needed	Missing whether currently operating	
Felony	-1.94*** (0.057)	-5.03*** (1.084)	-0.034*** (0.0051)	-0.091*** (0.0059)	-0.131*** (0.0061)	0.115*** (0.0061)	0.0046*** (0.0011)	0.0023* (0.0013)	-0.0103*** (0.0031)	
N observations	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000	550,000	
Outcome mean for non-felony	2.81	39.7	0.26	0.453	0.586	0.211	0.005	0.012	0.095	
Panel D: Business characteristics (covariate-adjusted)										
	Business age	Receipts in \$1,000s	No start-up capital needed	No expansion needed	Currently operating	Missing the business age	Missing whether start-up capital was needed	Missing whether expansion was needed	Missing whether currently operating	
Felony	0.0000*** (0.0000)	-2.90*** (1.08)	-0.0074 (0.0049)	-0.0234*** (0.0054)	-0.0303*** (0.0052)	0.0136*** (0.0033)	0.0037*** (0.0011)	0.0026** (0.0013)	-0.0195*** (0.0027)	
N observations	550000	550000	550000	550000	550000	550000	550000	550000	550000	
Outcome mean for non-felony	5.34	39.7	0.26	0.453	0.586	0.396	0.005	0.012	0.094	

Source: Authors' calculations from estimates are based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file), SBO survey (waves 2002, 2007, 2012), Census Numident, and Census Best Race Files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample includes all Schedule C filers responding to the SBO survey in the 2002, 2007, and 2012 waves, weighted using survey weights. Respondents that have non-responses for all three questions of Startup Capital Source, Expansion Capital Source, Currently in Operations are dropped from the sample. Non-response in the survey is not imputed. Rate of non-response across the groups are similar. The table reports the difference in responses for owners with a felony record, along with standard errors and the outcome mean for those without a felony record as of the survey year. For Panel D, controls include all owner demographics, industry fixed effects, and business characteristics (except the business characteristic of interest) in Appendix Table A2 Panels A, B, and C along with survey wave by business age fixed effects.

* p<0.10, ** p<0.05, *** p<0.01

Appendix Table A3: Differences in reported start-up capital, expansion capital and reason for closing among Schedule C filers

	(1)	(2)	(3)	(4)	(5)	
Panel A: Start-up capital source						
	Personal or family savings/non-savings	Gov't or bank loan	Credit card	Other source		
I(Felony conv)	-0.0282*** (0.0066)	-0.0218*** (0.0046)	0.0056 (0.0066)	0.0406*** (0.0054)		
N	285,000	285,000	285,000	285,000		
Outcome mean for non-CJ	0.865	0.09	0.145	0.067		
Panel B: Expansion capital source						
	Personal or family savings/non-savings	Gov't or bank loan	Credit card	Other source		
I(Felony conv)	-0.1436*** (0.0080)	-0.0336*** (0.0032)	-0.0686*** (0.0052)	0.0167*** (0.0028)	0.0071 (0.0056)	
N	243,000	243,000	243,000	243,000	243,000	
Outcome mean for non-CJ	0.501	0.073	0.179	0.018	0.144	
Panel C: Reason for ceasing operations						
	Low sales	Lack of access to capital	Sold or started another business	Retired or deceased	Other reason	
I(Felony conv)	0.0736*** (0.0125)	0.0607*** (0.0083)	-0.0282*** (0.0071)	-0.0176** (0.0058)	-0.0932*** (0.0063)	0.0411** (0.0129)
N	97,000	97,000	97,000	97,000	97,000	97,000
Outcome mean for non-CJ	0.288	0.051	0.107	0.072	0.163	0.444

Source: Authors' calculations from estimates based on CJARS vintage 2022Q4, IRS Form 1040 for TY 2019, Business Register (2019 SSNunits file), SBO survey (waves 2002, 2007, 2012), Census Numident, and Census Best Race Files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is a pooled cross-section of all Schedule C filers responding to the SBO survey in the 2002, 2007, and 2012 waves, weighted using survey weights. The SBO survey samples exclude Schedule C businesses with less than \$1,000 in receipts for all industries except construction and more than \$1 million in receipts. Respondents that have non-responses for all three questions of Startup Capital Source, Expansion Capital Source, Currently in Operations are dropped from the sample. Non-response in the survey is not imputed. Rate of non-response across the groups are similar. The table reports the non-adjusted difference in responses for owners with a felony record along with standard errors and the outcome mean for those without a felony record as of the survey year.

* p<0.10, ** p<0.05, *** p<0.01 (Throughout the paper, this indicates rejecting the null at the corresponding levels of 10%, 5%, and 1%)

Appendix Table A4: Balance checks for 2019 Schedule C filers (EITC Exclusion Sample)

	(1)	(2)	(3)	(4)	(5)
Panel A: Distribution of filers by time since last felony conviction					
	N Filers				
I(Felony conv $\geq$ 5 yrs)	-0.0884 (0.09) [10.79]				
Range of days since last fel. conv.	1,200				
Panel B: Demographics					
	Male	Age	Black		
I(Felony conv $\geq$ 5 yrs)	0.0116 (0.0159) [0.732]	0.0002 (0.0091) [3.62]	0.0033 (0.0128) [0.146]		
N	13,000	13,000	13,000		
Panel C: Business characteristics in 2019					
	Total revenue (IHS)	Business age	Construction	Waste mngmnt	Other services
I(Felony conv $\geq$ 5 yrs)	0.0291 (0.0571) [3.01]	0.0041 (0.0641) [1.46]	-0.0132 (0.0174) [0.294]	-0.0161 (0.0132) [0.153]	0.0065 (0.0117) [0.138]
N	13,000	13,000	13,000	13,000	13,000
Panel D: Labor market involvement in 2019					
	W-2 Filed over \$1000	W-2 Earnings (IHS)			
I(Felony conv $\geq$ 5 yrs)	-0.0012 (0.0181) [0.52]	0.0252 (0.1871) [5.67]			
N	13,000	13,000			
Panel E: Criminal history by 2019					
	Any financial fel.	Any misd. conv	Num misd. Convs		
I(Felony conv $\geq$ 5 yrs)	0.0083 (0.0135) [0.138]	-0.0063 (0.0173) [0.548]	0.0166 (0.081) [1.53]		
N	13,000	13,000	13,000		
Panel F: Supervision status on April 3, 2020					
	On probation	In prison	On parole		
I(Felony conv $\geq$ 5 yrs)	0.0185 (0.0171) [0.322]	-0.0027 (0.0079) [0.062]	0.0015 (0.0075) [0.046]		
N	13,000	13,000	13,000		
Panel G: Predicted outcomes					
	Conv in 12 mths	Sch C in 2021	W-2 in 2021		
I(Felony conv $\geq$ 5 yrs)	0.0002 (0.0008) [0.016]	0.0029 (0.0064) [0.472]	0.0007 (0.0103) [0.503]		
N	13,000	13,000	13,000		

Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule in 2019. High-PPP-exposure counties are defined by Granja et al. (2022). The bandwidth is 20 months on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors (in parentheses) are clustered by days since the last conviction. Average outcome on the left side of the cutoff is show in brackets.

Appendix Table A5: Balance checks for 2019 Schedule C filers (Positive Revenue Sample)

	(1)	(2)	(3)	(4)	(5)
Panel A: Distribution of filers by time since last felony conviction					
	N Filers				
I(Felony conv $\geq$ 5 yrs)	-0.0259				
	(-0.02)				
	[12.17]				
Range of days since last fel. conv.	1,200				
Panel B: Demographics					
	Male	Age	Black		
I(Felony conv $\geq$ 5 yrs)	0.0061	0.0002	0.0020		
	(0.0158)	(0.0083)	(0.0128)		
	[0.686]	[3.61]	[0.151]		
N	14,500	14,500	14,500		
Panel C: Business characteristics in 2019					
	Total revenue (IHS)	Business age	Construction	Waste mngmnt	Other services
I(Felony conv $\geq$ 5 yrs)	0.0276	0.0162	-0.0080	0.0067	-0.0091
	(0.0471)	(0.0626)	(0.0160)	(0.0115)	(0.0132)
	[3.149]	[1.469]	[0.288]	[0.144]	[0.166]
N	14,500	14,500	14,500	14,500	14,500
Panel D: Labor market involvement in 2019					
	W-2 Filed over \$1000	W-2 Earnings (IHS)			
I(Felony conv $\geq$ 5 yrs)	0.0014	0.0626			
	(0.0173)	(0.1735)			
	[0.491]	[5.323]			
N	14,500	14,500			
Panel E: Criminal history by 2019					
	Any financial fel.	Any misd. conv	Num misd. Convs		
I(Felony conv $\geq$ 5 yrs)	0.0126	-0.0031	0.0696		
	(0.0133)	(0.0163)	(0.0769)		
	[0.146]	[0.559]	[1.578]		
N	14,500	14,500	14,500		
Panel F: Supervision status on April 3, 2020					
	On probation	In prison	On parole		
I(Felony conv $\geq$ 5 yrs)	0.0215	-0.0010	0.0017		
	(0.0165)	(0.0077)	(0.0072)		
	[0.319]	[0.064]	[0.042]		
N	14,500	14,500	14,500		
Panel G: Predicted outcomes					
	Conv in 12 mths	Sch C in 2021	W-2 in 2021		
I(Felony conv $\geq$ 5 yrs)	0.0007	0.0036	0.0021		
	(0.0008)	(0.0059)	(0.0095)		
	[0.018]	[0.478]	[0.489]		
N	14,500	14,500	14,500		

Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with total revenue above zero dollars in 2019.

High-PPP-exposure counties are defined by Granja et al. (2022). The bandwidth is 20 months on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors (in parentheses) are clustered by days since the last conviction. Average outcome on the left side of the cutoff is show in brackets.

Appendix Table A6: Robustness to different bandwidth selections, in 6-month intervals for all Schedule C filers in all counties

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	+/-6 months	+/-12 months	+/-18 months	+/- 20 months	+/-24 months	+/-30 months	+/-36 months
Panel A: PPP receipt in 1st wave, EITC Exclusion							
I(Felony conv $\geq$ 5 yrs)	0.0421*** (0.0136)	0.0227** (0.0088)	0.0168** (0.0065)	0.0163*** (0.0612)	0.0140** (0.0057)	0.0133*** (0.0050)	0.0145*** (0.0046)
Panel B: PPP receipt in 1st wave, Positive Revenue							
I(Felony conv $\geq$ 5 yrs)	0.0356*** (0.0128)	0.0201** (0.0083)	0.0144** (0.0061)	0.0142** (0.0058)	0.0110** (0.0053)	0.0103** (0.0046)	0.0122*** (0.0042)
Panel C: Conviction by 12 months, EITC Exclusion							
I(Felony conv $\geq$ 5 yrs)	-0.0078 (0.0090)	-0.0051 (0.0057)	-0.0068 (0.0044)	-0.0070* (0.0042)	-0.0057 (0.0038)	-0.0037 (0.0035)	0.0010 (0.0033)
Panel D: Conviction by 12 months, Positive Revenue							
I(Felony conv $\geq$ 5 yrs)	-0.0130 (0.0084)	-0.0089 (0.0057)	-0.0094** (0.0044)	-0.0096** (0.0041)	-0.0078** (0.0038)	-0.0044 (0.0035)	-0.0013 (0.0032)
Panel E: Self-employed in 2021, EITC Exclusion							
I(Felony conv $\geq$ 5 yrs)	0.0272 (0.0378)	0.0354 (0.0233)	0.0344* (0.0181)	0.0377** (0.0171)	0.0235 (0.0158)	0.0167 (0.0139)	0.0072 (0.0127)
Panel F: Self-employed in 2021, Positive Revenue							
I(Felony conv $\geq$ 5 yrs)	0.0086 (0.0355)	0.0107 (0.0219)	0.0134 (0.0171)	0.0180 (0.0162)	0.0038 (0.0151)	0.0024 (0.0131)	-0.0032 (0.0120)
Panel G: W-2 filed in 2021, EITC Exclusion							
I(Felony conv $\geq$ 5 yrs)	-0.0361 (0.0309)	-0.0471** (0.0187)	-0.0531*** (0.0147)	-0.0497*** (0.0138)	-0.0413*** (0.0127)	-0.0249** (0.0114)	-0.0186* (0.0105)
Panel H: W-2 filed in 2021, Positive Revenue							
I(Felony conv $\geq$ 5 yrs)	0.0412 (0.0336)	-0.0330* (0.0195)	-0.0385** (0.0154)	-0.0367** (0.0145)	-0.0326** (0.0130)	-0.0196* (0.0116)	-0.0128 (0.0107)
N Sch C filers, EITC Exclusion	3,600	7,600	11,500	13,000	15,500	19,500	23,000
N Sch C filers, Positive Revenue	4,000	8,500	13,000	14,500	17,500	21,500	26,000

Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). High-PPP-exposure counties are defined by Granja et al. (2022). Controls include sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with measure of criminal history in the past ten years including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. The bandwidth is varied by six-month increments on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

* p<0.10, ** p<0.05, *** p<0.01

Appendix Table A7: Robustness to specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: PPP receipt in 1st wave, EITC Exclusion									
I(Felony conv $\geq$ 5 yrs)	0.0151** (0.0060)	0.0163*** (0.0061)	0.0163*** (0.0062)	0.0141** (0.0064)	0.0123* (0.0065)	0.0194*** (0.0070)	0.0175*** (0.0067)	0.0257** (0.0104)	0.0162*** (0.0061)
Panel B: PPP receipt in 1st wave, Positive Revenue									
I(Felony conv $\geq$ 5 yrs)	0.0131** (0.0057)	0.0152*** (0.0056)	0.0142** (0.0058)	0.0129** (0.0059)	0.0115* (0.0060)	0.0173*** (0.0066)	0.0157** (0.0063)	0.0234** (0.0099)	0.0142** (0.0057)
Panel C: Conviction by 12 months, EITC Exclusion									
I(Felony conv $\geq$ 5 yrs)	-0.0072* (0.0039)	-0.0081** (0.0041)	-0.0070* (0.0042)	-0.0080* (0.0044)	-0.0067 (0.0044)	-0.0073 (0.0045)	-0.0071 (0.0044)	-0.0086 (0.0068)	-0.0070* (0.0040)
Panel D: Conviction by 12 months, Positive Revenue									
I(Felony conv $\geq$ 5 yrs)	-0.0090** (0.0039)	-0.0102** (0.0040)	-0.0096** (0.0042)	-0.0105** (0.0043)	-0.0099** (0.0044)	-0.0101** (0.0044)	-0.0098** (0.0043)	-0.0108 (0.0066)	-0.0096** (0.0040)
Panel E: Self-employed in 2021, EITC Exclusion									
I(Felony conv $\geq$ 5 yrs)	0.0344** (0.0163)	0.0336** (0.0167)	0.0377** (0.0171)	0.0368** (0.0174)	0.0312* (0.0182)	0.0353* (0.0187)	0.0345* (0.0181)	0.0330 (0.0275)	0.0377** (0.0165)
Panel F: Self-employed in 2021, Positive Revenue									
I(Felony conv $\geq$ 5 yrs)	0.0145 (0.0154)	0.0130 (0.0158)	0.0180 (0.0162)	0.0176 (0.0165)	0.0163 (0.0172)	0.0119 (0.0171)	0.0119 (0.0171)	0.0024 (0.0256)	0.0180 (0.0155)
Panel G: W-2 filed in 2021, EITC Exclusion									
I(Felony conv $\geq$ 5 yrs)	-0.0469*** (0.0133)	-0.0439*** (0.0135)	-0.0497*** (0.0138)	-0.0498*** (0.0143)	-0.0429*** (0.0147)	-0.0490*** (0.0149)	-0.0500*** (0.0146)	-0.0486** (0.0221)	-0.0484*** (0.0134)
Panel H: W-2 filed in 2021, Positive Revenue									
I(Felony conv $\geq$ 5 yrs)	-0.0338** (0.0136)	-0.0331** (0.0139)	-0.0367** (0.0145)	-0.0378** (0.0148)	-0.0299** (0.0152)	-0.0344** (0.0158)	-0.0346** (0.0154)	-0.0333 (0.0233)	-0.0355** (0.0141)
N Sch C filers, EITC Exclusion	13,500	13,500	13,000	13,000	12,500	13,000	13,000	13,000	13,000
N Sch C filers, Positive Revenue	15,000	15,000	14,500	14,500	14,000	14,500	14,500	14,500	14,500
Donut	None	15 days	30 days	45 days	60 days	30 days	30 days	30 days	30 days
Weighting	uniform	uniform	uniform	uniform	uniform	triangle	epan	uniform	uniform
Functional form	linear	linear	linear	linear	linear	linear	linear	quadratic	local linear

Source: Estimates are based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file) SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). High-PPP-exposure counties are defined by Granja et al. (2022). Controls include sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with measure of criminal history in the past ten years including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. The baseline specification uses observations within 20 months of the cutoff on either side, except for the donut from -30.25 to 1 days, weighted uniformly and controlling linearly for the running variable on either side of the cutoff. The alternative specifications vary the donut in two-week increments (columns (1) to (5)), the weighting to either triangular or epanechnikov (columns (6) to (7)), and the functional form to quadratic or local linear (columns (8) to (9)). Standard errors are clustered by days since the last conviction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table A8: Low PPP exposure areas

	PPP receipt first wave	In prison in 2020	On parole in 2020	On probation in 2020	Conviction in 9 months	Conviction in 12 months	Conviction in 18 months	Filed Sch C in 2021	Total revenue in 2021	Payroll bill in 2021	Filed W-2 in 2021	W-2 earnings in 2021
<i>Panel A: EITC Exclusion Sample</i>												
I(Felony conv $\geq$ 5 yrs)	-0.0050 (0.0034)	0.0005 (0.0038)	0.0074* (0.0040)	0.0059 (0.0071)	-0.0021 (0.0024)	-0.0031 (0.0029)	-0.0038 (0.0033)	0.0144 (0.0104)	-1027 (1540)	-19.8 (43.6)	0.0070 (0.0089)	153 (556)
Number of Sch C filers	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
Average on left side of cutoff	0.026	0.04	0.038	0.233	0.014	0.018	0.025	0.477	23700	224	0.497	16300
<i>Panel B: Positive Revenue Sample</i>												
I(Felony conv $\geq$ 5 yrs)	-0.0040 (0.0033)	0.0016 (0.0037)	0.0063* (0.0037)	0.0009 (0.0071)	-0.0042* (0.0024)	-0.0051* (0.0029)	-0.0064* (0.0035)	0.0093 (0.0100)	-1028 (1427)	-30.5 (42.5)	0.0043 (0.0087)	146 (514)
Number of Sch C filers	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Average on left side of cutoff	0.025	0.042	0.037	0.238	0.016	0.02	0.029	0.49	23200	218	0.468	13900

Source: Estimates are based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file) SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in the 2019 tax year in low PPP exposure counties, defined as counties not in the top quartile.

Observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to 1 days. Standard errors are clustered by days since the last conviction.

* p<0.10, ** p<0.05, *** p<0.01

Appendix Table A9: Placebo exercise using non-Schedule C filers

	PPP receipt first wave	In prison in 2020	On parole in 2020	On probation in 2020	Conviction in 9 months	Conviction in 12 months	Conviction in 18 months	Filed Sch C in 2021	Total revenue in 2021	Payroll bill in 2021	Filed W-2 in 2021	W-2 earnings in 2021
<i>Panel A: EITC Exclusion Sample</i>												
I(Felony conv $\geq$ 5 yrs)	0.0001 (0.0005)	-0.0037 (0.0036)	-0.0043 (0.0027)	0.0066 (0.0043)	0.0007 (0.0014)	0.0013 (0.0016)	0.0011 (0.0018)	0.0010 (0.0024)	-80.1 (121)	2.09 (13.3)	0.0029 (0.0045)	315 (231)
Number of Sch C filers	131,000	131,000	131,000	131,000	131,000	131,000	131,000	131,000	131,000	131,000	131,000	131,000
Average on left side of cutoff	0.001	0.146	0.05	0.248	0.015	0.02	0.029	0.048	932	12.5	0.595	15600
<i>Panel B: All 1040 filers</i>												
I(Felony conv $\geq$ 5 yrs)	-0.0001 (0.0004)	-0.0037 (0.0036)	-0.0024 (0.0035)	-0.0041 (0.0026)	0.0066 (0.0042)	0.0015 (0.0015)	0.0016 (0.0018)	0.0008 (0.0024)	-66.7 (116)	3.83 (12.6)	0.0019 (0.0044)	264 (219)
Number of Sch C filers	138,000	131,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000
Average on left side of cutoff	0.001	0.146	0.141	0.049	0.248	0.02	0.03	0.05	940	12.1	0.593	15200

Source: Estimates are based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2019-2022, Business Register (TY 2019-2022 SSNunits file) SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all 1040 filers that do not also file a Schedule C in the 2019 tax year in high PPP exposure counties, defined as the top quartile. Observations are only included if they are within 20 months of the cutoff on either side, except for the donut from -30.25 to 1 days. Standard errors are clustered by days since the last conviction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table A10: Placebo exercise two years prior to policy implementation

	In prison in 2018	On parole in 2018	On probation in 2018	Conviction in 9 months	Conviction in 12 months	Conviction in 18 months	Filed Sch C in 2019	Total revenue in 2019	Payroll bill in 2019	Filed W-2 in 2019	W-2 earnings in 2019
<i>Panel A: EITC Exclusion Sample</i>											
I(Felony conv $\geq$ 5 yrs)	0.0027 (0.0122)	0.0043 (0.0084)	0.0135 (0.0145)	-0.0003 (0.0063)	-0.0003 (0.0069)	-0.0001 (0.0075)	0.0139 (0.0147)	2199 (2949)	-2721 (2888)	0.0102 (0.0118)	686.9 (976.2)
Number of Sch C filers	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500	11,500
Average on left side of cutoff	0.114	0.048	0.245	0.031	0.037	0.05	0.531	33,200	1,760	0.529	20,100
<i>Panel B: Positive Revenue Sample</i>											
I(Felony conv $\geq$ 5 yrs)	0.0178 (0.0115)	0.0006 (0.0080)	0.0084 (0.0129)	0.0007 (0.0062)	-0.0006 (0.0071)	0.0020 (0.0074)	0.0102 (0.0139)	2280 (2617)	-2470 (2553)	-0.0021 (0.0111)	690.2 (864.7)
Number of Sch C filers	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
Average on left side of cutoff	0.111	0.049	0.248	0.034	0.041	0.054	0.532	30,800	1,600	0.51	17,500

Source: Authors' calculations from Estimates are based on CJARS vintage 2022Q4, IRS Form 1040 and W-2 for TY 2017-2019, Business Register (TY 2017-2019 SSNunits file) SBA Paycheck Protection Program loan data, Census Best Race Files, and PPP exposure files from Granja et al. (2022). U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in the 2017 tax year within the RDD bandwidth in high PPP exposure counties, defined as the top quartile. Observations are only included if they are within 20 months of the cutoff on either side. Standard errors are clustered by days since the last conviction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table A11: Additional effects of PPP eligibility on entrepreneurial activity and labor market behavior among Schedule C filers

	(1)	(2)	(3)	(4)	(5)	(6)
	Ever Receive PPP Loan	Filed Sch C in 2022	Total Revenue in 2022	Firm Payroll Bill in 2022	Paid Employment in 2022	W-2 Earnings in 2022
<i>Panel A: EITC Exclusion Sample</i>						
I(Felony conv $\geq$ 5 yrs)	0.0204* (0.0106)	0.0136 (0.0182)	220.3 (2,455)	30.80* (18.67)	-0.0334* (0.0159)	-2,139 (1,163)
N	13,000	13,000	13,000	13,000	13,000	13,000
Average on left side of cutoff	0.096	0.377	19,800	51	0.516	19,500
<i>Panel B: Positive Revenue Sample</i>						
I(Felony conv $\geq$ 5 yrs)	0.0106 (0.0104)	0.0075 (0.0173)	-525.8 (2,199)	21.60 (16.37)	-0.0189 (0.0153)	-1,310 (1,090)
N	14,500	14,500	14,500	14,500	14,500	14,500
Average on left side of cutoff	0.095	0.385	18,900	48	0.499	17,200

Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). High-PPP-exposure counties are defined by Granja et al. (2022). Controls include sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with measure of criminal history in the past ten years including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. The bandwidth is 20 months on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table A12: Additional effects of PPP eligibility on type of criminal activity among Schedule C filers

	(1)	(2)	(3)	(4)	(5)
	Violent 12 months	Income generating 12 months	Financial 12 months	Substance abuse 12 months	Other 12 months
<i>Panel A: EITC Exclusion Sample</i>					
I(Felony conv $\geq$ 5 yrs)	-0.0025 (0.0016)	-0.0005 (0.0015)	-0.0017* (0.0010)	-0.0043* (0.0023)	-0.0013 (0.0034)
N	13,000	13,000	13,000	13,000	13,000
Average on left side of cutoff	0.003	0.002	0.001	0.004	0.01
<i>Panel B: Positive Revenue sample</i>					
I(Felony conv $\geq$ 5 yrs)	-0.0031** (0.0015)	-0.0012 (0.0018)	-0.0028** (0.0013)	-0.0052** (0.0023)	-0.0037 (0.0033)
N	14,500	14,500	14,500	14,500	14,500
Average on left side of cutoff	0.003	0.003	0.001	0.005	0.01

Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). High-PPP-exposure counties are defined by Granja et al. (2022). Controls include sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with measure of criminal history in the past ten years including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. The bandwidth is 20 months on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table A13: Heterogeneous effects of PPP eligibility on loan receipt, convictions, and labor market activity

	(1)	(2)	(3)	(4)
	PPP Receipt in First Wave	Any Conviction in 12 mths	Self Employment in 2021	Paid Employment in 2021
Panel A: White Schedule C filers, EITC Exclusion Sample				
I(Felony conv $\geq$ 5 yrs)	0.0178** (0.0079) [0.024]	-0.0081* (0.0046) [0.013]	0.0336 (0.0210) [0.476]	-0.0553*** (0.0161) [0.45]
Number of Sch C filers	9,100	9,100	9,100	9,100
Panel B: White Schedule C filers, Positive Revenue Sample				
I(Felony conv $\geq$ 5 yrs)	0.0152** (0.0073) [0.023]	-0.0089* (0.0046) [0.014]	0.0219 (0.0201) [0.482]	-0.0449*** (0.0164) [0.429]
Number of Sch C filers	10,000	10,000	10,000	10,000
Panel C: Non-white Schedule C filers, EITC Exclusion Sample				
I(Felony conv $\geq$ 5 yrs)	0.0144 (0.0097) [0.018]	-0.0087 (0.0093) [0.024]	0.0406 (0.0310) [0.461]	-0.0289 (0.0296) [0.504]
Number of Sch C filers	3,900	3,900	3,900	3,900
Panel D: Non-white Schedule C filers, Positive Revenue Sample				
I(Felony conv $\geq$ 5 yrs)	0.0118 (0.0093) [0.018]	-0.0160* (0.0086) [0.025]	-0.0028 (0.0296) [0.472]	-0.0045 (0.0292) [0.485]
Number of Sch C filers	4,500	4,500	4,500	4,500

Source: Authors' calculations from CJARS vintage 2022q4, 2019 IRS Form 1040, 2014-2019 Business Register, 2019, W-2s, Small Business Administration PPP microdata, Census Numident, and Census Best Race files. U.S. Census Bureau, Project 7500378, DRB approvals: CBDRB-FY24-0121, CBDRB-FY24-0277, CBDRB-FY24-SEHSD-013-009, CBDRB-FY24-SEHSD-013-010, CBDRB-FY25-SEHSD-013-001.

Notes: The sample is all Schedule C filers in 2019 in high-PPP-exposure counties filing with adjusted gross income exceeding the first kink point in the EITC benefit schedule (EITC Exclusion Sample) or total revenue above zero dollars in 2019 (Positive Revenue Sample). High-PPP-exposure counties are defined by Granja et al. (2022). Controls include sex by race fixed effects, logged age, county fixed effects, business age as of 2019, Schedule C total revenue in 2019, fixed effects for 2-digit NAICS codes in 2019 of Schedule C business, an indicator for having a W-2 over \$1,000 filed, W-2 earnings in 2019, along with measure of criminal history in the past ten years including indicators for having a financial felony conviction or any misdemeanor conviction and the number of misdemeanor convictions. The bandwidth is 20 months on either side of the cutoff with a donut from -30.25 to -1 days. Standard errors are clustered by days since the last conviction.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$