

**Entrepreneurship as a Response to Labor Market Discrimination
for Formerly Incarcerated People¹**

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ABSTRACT

This paper examines entrepreneurship as a way to overcome labor market discrimination. Specifically, we examine entrepreneurship as a career choice for formerly incarcerated individuals, a group of individuals who face substantial discrimination in the labor market. Using the United States National Longitudinal Survey of Youth 1997 data, we find that formerly incarcerated people are more likely to become entrepreneurs compared to individuals without a criminal record. We take advantage of an exogenous state and county level policy shock “Ban-the-Box” in the United States to further disentangle the underlying mechanism of how labor market discrimination affects formerly incarcerated individuals in their entrepreneurial choices. The findings suggest that entrepreneurship is a viable alternative career choice for formerly incarcerated people, yielding both higher income and lower recidivism rates. In addition to reporting robustness checks and addressing alternative explanations, we discuss theoretical, empirical, and policy implications.

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INTRODUCTION

The United States is the world's leader in incarceration with 2.2 million people in prisons and jails as of 2016, marking a 600% increase of the penal population over the last 40 years (Bureau of Justice Statistics 2018). This increase has also led to more than 600,000 people per year reentering society from incarceration (Bureau of Justice Statistics 2019). Successful reentry is the exception however, with over two-thirds of formerly incarcerated people rearrested within three years of reentry (Alper et al. 2018).

One of the key factors thwarting successful reentry is the severe discrimination in the labor market faced by formerly incarcerated people. As of 2018, formerly incarcerated people suffer from an unemployment rate of 27.3 percent compared to 5.8 percent for the general public (Prison Policy Initiative 2018). Formerly incarcerated individuals – especially those who are African American – are not only less likely to be hired by employers, but those who are hired earn lower wages and experience less wage mobility (Petit and Western 2004, Western and Petit 2005, Western and Beckett 1999, Pager 2003, Western 2002). The evidence by scholars, combined with first-person accounts, has given rise to a stylized fact which is captured by an unemployment-recidivism narrative: formerly incarcerated individuals face labor discrimination that leads to unemployment or underemployment, and as a consequence their likelihood of returning to prison substantially increases. In informing this narrative, scholarly research has also fueled our understanding that until labor market discrimination is substantially reduced, the U.S. will continue to be faced with poor reentry outcomes.

In this paper we offer a modification to this narrative by drawing attention to formerly incarcerated people who become entrepreneurs.³ Here, entrepreneurship is examined as a response to labor market discrimination, where one not only overcomes this discrimination by earning an income through starting a new business, but in doing so also increases the overall chance of successful reentry. Through this examination we seek to complement long-run efforts to reduce labor market discrimination with an evaluation of entrepreneurship as an alternative trajectory. We also contribute to the important yet challenging question of how stigmatized individuals can overcome persistent labor market discrimination without solely depending on employers' shifting priorities and public policy changes. Thus, while we maintain the existing narrative of unemployment and recidivism for formerly incarcerated individuals, this paper broadens the focus on employment to include entrepreneurship.

Specifically, we investigate whether formerly incarcerated individuals are more likely to become entrepreneurs compared to those without criminal records. Entrepreneurial entry decisions are made as a function of a worker's calculus of whether to pursue paid employment or launch a new venture (Sørensen and Sharkey, 2014, Kacperczyk, 2012, Yang and Kacperczyk 2018, Hellmann, 2007). As labor market discrimination decreases opportunities for paid employment (Pager, Western, and Bonikowski, 2009, Pager 2003), such lack of employment opportunities may push individuals into starting their own businesses (Light 1972). Thus, compared to individuals who have never been to prison, formerly incarcerated individuals may be more likely to seek entrepreneurship as a route to secure work and income.

³ Following prior studies on entrepreneurship, we define entrepreneurship conceptually as launching a new business (Evans 1989, Sørensen and Sharkey 2014, Yang and Aldrich 2014) and operationally as self-employment (Greenfield et al 1979, Fairlie 1999, Aldrich 1990, Hegde and Tumilson 2018). For robustness, we also examine incorporated self-employment and self-employment with employees.

Importantly, we unpack an underlying causal mechanism of why formerly incarcerated individuals become entrepreneurs. The decision to become an entrepreneur is driven by many characteristics correlated with incarceration such as education, poverty, and risk-preference. We parse out the diverse underlying mechanisms driving entrepreneurial entry of formerly incarcerated individuals, by taking advantage of the staggered implementation of an exogenous state and county-level policy shock in the United States, the “Ban-the-Box” policy. The “Ban-the-Box” policy, which has been implemented in 35 states and over 150 counties as of 2019, bars employers from checking criminal backgrounds until later in the hiring process (Avery and Hernandez 2019). The policy aims to mitigate discrimination in the employment process and increase employment opportunities for formerly incarcerated individuals. We use the introduction of this policy to unpack whether entrepreneurial entry of formerly incarcerated individuals is driven by the lack of alternative employment opportunities in the labor market.

We find that formerly incarcerated individuals are more likely to become entrepreneurs than those who have never been incarcerated. More critical to our thesis however, the likelihood of entrepreneurship for those who have been to prison varies by whether or not they were residing in a locale where the “Ban-the-Box” policy was implemented. In particular, formerly incarcerated individuals are less likely to enter into entrepreneurship when “Ban-the-Box” policy is implemented in the state or county of residence, indicating that a key reason that individuals with criminal records pursue entrepreneurship is to overcome labor market discrimination. We also find this effect is strongest for African American formerly incarcerated individuals, who experience the greatest labor market discrimination before the implementation of “Ban-the-Box”. These findings help us gain insight into the underlying mechanism of how the change in the severity of labor market discrimination affects entrepreneurship rates.

We further investigate whether entrepreneurship can be a valid route to overcome labor market discrimination for formerly incarcerated individuals by examining their income and recidivism rates. The negative relationship between incarceration and income is commonly attributed to the stigma of a criminal record, as employers undervalue formerly incarcerated individuals as employees and impose income penalties (Holzer, Raphael, and Stoll 2003, Western and Beckett 1999, Western 2002). We argue that entrepreneurship will mitigate the income inequality that formerly incarcerated individuals experience in paid employment, as entrepreneurship provides an opportunity to earn based on one's productivity rather than an employer's valuation (Hegde and Tumilson 2018). We find supportive evidence that entrepreneurship provides formerly incarcerated individuals with higher income compared to their earnings from employment, helping individuals with criminal records to close the income gap.

Concerning recidivism, we argue that entrepreneurship offers both greater economic incentives and social incentives, such as responsibility and work satisfaction, that desist formerly incarcerated individuals from reengaging in criminal activity. We find evidence that entrepreneurship decreases the likelihood of returning to prison beyond the effect of paid employment, supporting the view of entrepreneurship as a way for formerly incarcerated individuals to successfully reenter the society. These findings on income and recidivism suggest that entrepreneurship may not only help discriminated individuals improve their economic well-being, but also to improve social integration.

We test the propositions of this paper using data drawn from the United States National Longitudinal Survey of Youth (NLSY97) from 1997 to 2015. We combine this dataset with data we collected from the National Employment Law Project on the implementation of "Ban-the-

Box” policies in the U.S. at the state and county level (Avery 2019). We address endogeneity concerns by taking advantage of a quasi-experimental design, which uses the exogenous state and county level policy shock, “Ban-the-Box.” For further robustness, we also conduct three different types of matching procedures to restrict the analysis to a comparison between formerly incarcerated individuals and non-formerly incarcerated individuals with similar characteristics. Our results are consistent throughout.

Our paper provides implications for theory, empirical work, and policy. We offer a modification to the current narrative on unemployment and recidivism for formerly incarcerated individuals by introducing entrepreneurship as an alternative route to successful reentry. We find that entrepreneurship provides an opportunity for formerly incarcerated individuals to not only find work and decrease economic inequality, but also to decrease recidivism rates. We contribute to empirical work by using a quasi-natural experiment design to establish causality and providing stronger evidence for the underlying mechanism between incarceration and entrepreneurship. Lastly, we provide policy implications by highlighting entrepreneurship as a route for formerly incarcerated individuals to overcome labor market discrimination without depending on policymakers or employers.

THEORY

Incarceration, Labor Market Discrimination, and Recidivism

In the past two decades, a growing number of studies have investigated the effect of incarceration on labor market outcomes. Scholars have found consistent evidence that contact

with the criminal justice system leads to reduction in economic opportunities (e.g. Petit and Western 2004, Pager 2003). Research has documented that individuals coming out of prisons or jails experience significantly lower employment, with the formal employment rate in the first year after release ranging from 40% to 64% (Western and Beckett 1999, Pager 2003, Freeman 1991, Waldfogel 1994, Petit and Lyons 2007). Scholars have further found that even when formerly incarcerated individuals do find employment, they are often relegated to jobs of lower quality (e.g. Western 2002). Formerly incarcerated individuals experience earnings penalties of 10% to 30% after release from prison, relative to their earnings prior to incarceration (Waldfogel 1994, Western 2002). Harding, Morenoff, and Wyse (2019) have found that formerly incarcerated individuals are often sorted into jobs that are characterized not only by lower wages, but also greater turnover, poor working conditions, and irregular work schedules. Other studies have emphasized longer term adverse effects of incarceration on economic opportunities, such as penalties in wage growth, upward job mobility, and job stability (Western 2002, Nagin and Waldfogel 1995, Bushway 1998).

Many studies on labor market outcomes have also observed racial disparities in the negative impact of incarceration on employment outcomes. Racial minorities, especially African Americans, are not only more likely to be incarcerated but also face greater penalties for incarceration (e.g. Pager 2003, Western 2002, Lyons and Petit 2011). Pager (2003) shows that the adverse effect of a criminal record is 40% larger for blacks than for similar white candidates looking for employment. Lyons and Petit (2011) document greater wage penalties for black formerly incarcerated individuals – 10% lower earnings and 21% slower wage growth – compared to similar white formerly incarcerated individuals.

One of the main reasons for such negative employment outcomes for formerly incarcerated people is discrimination based on the stigma associated with a criminal record (e.g. Pager 2003). Employers consider a criminal record as a “negative credential” signaling low worker quality (Grogger 1992), untrustworthiness (Waldfogel 1994), and lack of honesty (Lott 1992), and thus are less likely to hire formerly incarcerated individuals than comparable job applicants without a criminal record (Western 2002, Uggen et al 2014, Holzer, Raphael, and Stoll 2003). Particularly, the stigma of incarceration is intensified toward African Americans, where employers are more likely to discriminate when race and incarceration are compounded (Pager 2003). A series of recent audit experiments have found that employers discriminate based on criminal records, reducing the likelihood of a “callback” by 50% for white applicants with a record and 60% for black applicants with a record (Pager 2003, 2007, Pager, Western, and Bonikowski 2009, Uggen et al. 2014). While there are additional individual level mechanisms through which incarceration may negatively affect subsequent employment, such as erosion of human and social capital (Kling 1999, Hagan 1993, Harding, Morenoff, and Wyse 2019), the institutional effect of employer discrimination remains the main driver of adverse employment opportunities.

Researchers have underlined the significance of employment barriers associated with incarceration because employment is one of the strongest predictors of successful reentry. Studies show evidence that unemployment or job instability following release from prison increases the chances of reoffending (e.g. Shover 1996, Sampson and Laub 1997). Employment primarily provides formerly incarcerated individuals with the economic means for basic needs, reducing the material motivations for crime and increasing the costs of recidivism (Sampson and Laub 1997). Yet, beyond offering economic opportunities, employment is also a key foundation

for social reintegration and commitment (Sampson and Laub 1997, Harding, Morenoff, and Wyse 2019). Uggen (1999) elaborates that employment, diminishes recidivism rates even controlling for wages. Commitment to work and work satisfaction itself is a positive transition in the life course of formerly incarcerated individuals, reducing their motivation to commit another crime (Uggen 1999, Uggen 2000, Sampson and Laub 1997, Uggen and Staff 2001).

The adverse reentry consequences of unemployment or underemployment associated with labor market barriers for formerly incarcerated individuals has led to a stylized fact that is often represented by an unemployment-recidivism narrative. In this narrative, formerly incarcerated individuals face discrimination from employers that leads to unemployment or underemployment, and as a consequence their likelihood of successful reentry substantially decreases. The narrative and the evidence it represented has helped to focus researchers and policymakers on improving the employment prospects for formerly incarcerated people. Through efforts such as “Ban-the-Box” and Fair Chance Hiring, policymakers and employers have induced slight reduction in employment barriers for formerly incarcerated individuals.

Incarceration & Entrepreneurship

Despite this focus on improving employment prospects, labor market discrimination persists for formerly incarcerated individuals. Their unemployment rate remains 5 times higher than individuals without a criminal record, and employment for formerly incarcerated people continues to be limited to short-term, unstable, and lower paying jobs (Sugie 2018). Meanwhile, while labor markets discrimination persists, there is increasing anecdotal evidence of formerly incarcerated individuals carving out their own careers by becoming entrepreneurs. Yet research on understanding entrepreneurship as a reentry route for formerly incarcerated individuals has

been sparse in both sociology and economic literature. This paper, to our knowledge, is one of the first to examine how entrepreneurship can be an alternative labor market choice for formerly incarcerated people.

In particular, we offer a modification to the unemployment-recidivism narrative by considering entrepreneurship as an important alternative labor market choice for formerly incarcerated individuals. We argue that formerly incarcerated individuals may choose to launch their own business in response to barriers to employment. We suggest that entrepreneurship may provide formerly incarcerated individuals with not only economic opportunities but help their successful reentry into society. Thus, while gainful employment remains a more common path to successful reentry, we introduce entrepreneurship as an alternative route that formerly incarcerated individuals may pursue and benefit from when employment opportunities are scarce.

There are four primary questions we seek to address in this paper. First, we examine the extent to which formerly incarcerated people engage in entrepreneurship compared to people who have not been to prison. Second, we investigate the underlying mechanism as to why people who have been to prison choose to become entrepreneurs. Third, we assess whether entrepreneurship helps formerly incarcerated individuals overcome economic inequality, by examining earnings. Lastly, we address the question of how entrepreneurship affects successful reentry by investigating the recidivism rates of formerly incarcerated entrepreneurs.

Incarceration & Entrepreneurial Entry

The first question this study investigates is the extent to which formerly incarcerated individuals take part in entrepreneurship, compared to individuals who have never been to

prison. The decision to become an entrepreneur is a function of the set of opportunities available in the labor market (Burton, Sørensen, and Beckman 2002, Sørensen and Sharkey 2014). Müller and Arum (2004) note that individuals “actively decide” to take part in entrepreneurship after “considering the perceived relative costs and benefits attached to distinct paths” in the labor market. Career opportunities in the labor market shape the decision to transition into entrepreneurship (Amit, Muller, Cockburn 1995), making entrepreneurial entry more appealing when alternative labor market choices are relatively less compelling (Sørensen and Sharkey 2014, Kacperczyk and Marx 2016, Yang and Kacperczyk 2018, Castellaneta, Conti, and Kacperczyk, Hellmann 2007). As the labor market opportunity structure has a profound influence on an individual’s transition to entrepreneurship, discrimination in the labor market increases the likelihood of disadvantaged individuals to become entrepreneurs.

While entrepreneurship entails a risk of failure and uncertainty, labor market discrimination can mean that the expected returns from employment opportunities for formerly incarcerated individuals are lower than the returns from pursuing entrepreneurship. This implies that, compared to similar individuals without a criminal record, formerly incarcerated individuals are more likely to become entrepreneurs because they face lower expected returns from employment and thus lower opportunity costs of exiting employment and pursuing entrepreneurship. Accordingly, we formally test the extent to which formerly incarcerated individuals choose entrepreneurship as a labor market outcome.

Explanatory Mechanism of Incarceration & Entrepreneurship

Second, we unpack the underlying mechanism of why formerly incarcerated individuals enter entrepreneurship, compared to similar individuals who have not been incarcerated. This

focus allows us to parse out the effect of labor market discrimination from the individual level effect that drives formerly incarcerated individuals to transition into entrepreneurship.

We argue that the main underlying mechanism driving formerly incarcerated individuals into entrepreneurship is labor market discrimination. As shown by many scholars, the stigma associated with the mark of a criminal record negatively impacts employment opportunities for formerly incarcerated individuals, by increasing unemployment, work-related insecurity, and income penalties (Holzer, Raphael, and Stoll 2006; Pager 2007; Stoll and Bushway 2008; Pager, Western, and Bonikowski 2009, Sugie 2018). Such discrimination from employers decreases the opportunity cost of leaving employment and increases the expected returns from entrepreneurship relative to employment, and may push formerly incarcerated individuals to seek entrepreneurship as an alternative choice.

At the same time, individual level mechanisms such as preferences or human capital may make entrepreneurship more appealing than employment for formerly incarcerated individuals. Scholars have found suggestive evidence that individuals who take part in criminal activity are similar to entrepreneurs, in terms of low risk aversion and preference for autonomy (e.g. Gottschalk 2009, Lockwood et al 2006, Rieple 1998). Other studies also find that formerly incarcerated individuals possess human capital more fit for entrepreneurship than employment, such as higher entrepreneurial ability and lower employment-related ability and skills (Fairlie 2002, Sonfield, Lussier, and Barbato 2001).

While both labor market discrimination and individual level mechanisms may jointly drive the decision of formerly incarcerated individuals to transition into entrepreneurship, our focus is on understanding the mechanisms associated with labor market discrimination while using a research design to control for individual level mechanisms. Thus we examine whether

labor market discrimination drives formerly incarcerated individuals to choose entrepreneurship instead of employment, notwithstanding individual level mechanisms such as preferences or human capital. We are able to disentangle the two mechanisms by utilizing an exogenous change to one of the two drivers - labor market discrimination for formerly incarcerated individuals. As we argue that entrepreneurship is a response to labor market discrimination for formerly incarcerated individuals, we expect to find that the exogenous decrease of labor market discrimination for formerly incarcerated individuals will subsequently diminish their likelihood to enter into entrepreneurship. In particular, we expect to see the greatest reduction of entrepreneurial transitions for formerly incarcerated individuals who face the most labor market discrimination before the exogenous change – African American (black) formerly incarcerated individuals. Specifically, we expect to find that an exogenous decrease of labor market discrimination has a larger negative impact on the entrepreneurial entry rates of black formerly incarcerated individuals. By using the exogenous change of labor market discrimination, this study effectively isolates and verifies the effect of labor market discrimination on entrepreneurial transitions of formerly incarcerated people, beyond any individual effects.

Entrepreneurship & Income

Third, this study investigates whether formerly incarcerated individuals are able to overcome economic barriers through entrepreneurship, by examining earnings. Formerly incarcerated individuals experience considerable income penalties in employment because employers discriminate based on their criminal record (Western 2002). In other words, independent of the underlying ability of formerly incarcerated individuals, employers are more likely to undervalue their ability based on the stigma associated with a criminal record such as low worker quality (Grogger 1992), untrustworthiness (Waldfogel 1994), and lack of honesty

(Lott 1992). Yet, unlike employees, who receive their earnings based on the employer's valuation of potential ability, entrepreneurs are residual claimants of their own ability rather than noisy perceptions of it (Hegde and Tumilson 2018). Thus, employees that are undervalued by employers are more likely to increase their earnings by exiting employment and engaging in entrepreneurship.

These arguments suggest that formerly incarcerated people will be able to increase their earnings as entrepreneurs compared to their earnings as employees, as they no longer rely on the discriminatory perceptions of employers. While founding a new business entails risk of failure and higher variance in earnings, the elimination of discrimination and stigma that formerly incarcerated individuals face from employers will, on average, improve their earnings from entrepreneurship compared to that from employment. Thus, we expect entrepreneurship to increase earnings, compared to their employment income, for formerly incarcerated individuals. We also expect to find that the income gap between individuals with and without a criminal record will be smaller for entrepreneurs, compared to employees. By removing the barriers to competitive earnings, entrepreneurship will provide formerly incarcerated individuals the opportunity to mitigate economic inequality.

Entrepreneurship & Recidivism

Finally, the fourth objective of this study is to assess how entrepreneurship impacts successful reentry, by examining recidivism rates. Employment, or securing legitimate work, is one of the strongest predictors of desistance to crime (Glaser 1969, Farrington et al. 1986, Trasler 1979, Shover 1996, Sampson and Laub 1993, Uggen 2000, Bushway and Reuter 2002). Employment not only provides immediate financial support but also increases future expected

earnings, significantly increasing the opportunity cost of criminal behavior and consequentially reducing the likelihood of reoffending (Pezzin 1995). Thus, we expect that entrepreneurship, which we predict to yield greater economic opportunities than employment for formerly incarcerated individuals, will further reduce the likelihood of recidivism.

Moreover, entrepreneurship may also provide formerly incarcerated individuals social and psychological incentives to refrain from further criminal activities. Entrepreneurship entails being responsible for your business and often times the livelihood of fellow employees, increasing the sense of responsibility and commitment for formerly incarcerated entrepreneurs. Also, anecdotal evidence from formerly incarcerated entrepreneurs suggest that entrepreneurship enhances work satisfaction, self-esteem, and commitment.⁴ Studies have found that commitment to work and work satisfaction diminishes the likelihood of recidivism, beyond the financial aspect of work itself (Uggen 1999). Thus, such social and psychological incentives of entrepreneurship may further help individuals to stay out of prison. While it is beyond the scope of this paper to fully parse out these mechanisms, we expect entrepreneurship to decrease recidivism for formerly incarcerated individuals beyond paid employment, supporting the view of entrepreneurship as a way for formerly incarcerated individuals to successfully reenter society.

By investigating the four research questions, this paper seeks to present a modification to the narrative of unemployment and recidivism. We complement the current narrative focused on employment by introducing entrepreneurship as an alternative route for formerly incarcerated individuals to overcome both economic and social barriers to successful reentry. In the following

⁴ Defy Ventures: <https://defyventures.org/blog/entrepreneurship-as-a-tool-for-social-change-reflecting-on-my-time-at-defy-ventu>

sections, we describe the data and methods, and show our empirical analyses that allows us to address the above research questions.

DATA AND MEASURES

In order to investigate our research question, we merge data from the 1997 cohort of the National Longitudinal Survey of Youth (NLSY 97) with hand-coded data on “Ban-the-Box” policy changes for all states and counties of the United States. The NLSY97 follows the lives of a representative cohort of 8,984 men and women, who were 12-18 years old when first surveyed in 1997. These individuals were interviewed annually from 1997 through 2011 and biennially thereafter. The restricted NLSY97 Geocode data provide identifying information about yearly state and county level residence by survey respondent, thus allowing us to utilize county and state-level policy shocks to address the causal mechanism. As shown by prior research (e.g. Western 2002, Western and Petit 2010) the NLSY data is suitable for research on incarceration because it reports detailed data on youth detention and adult incarceration. Moreover, the NLSY dataset includes a comprehensive range of variables on entrepreneurship and employment, allowing us to examine entrepreneurial and employment transitions as well as related earnings. Our analyses use the NLSY 97 from years 1997 to 2015. Our final estimation sample is a balanced panel with 170,696 individual-year observations on 8,984 unique individuals.

We merged the NLSY 97 data with a hand-coded database on “Ban-the-Box” policy changes for all states and counties of the United States. We generated this data by combining details of “Ban-the-Box” policies from the National Employment Law Project (NELP) (Avery and Hernandez 2018). We supplemented the data from NELP by hand-coding details from

legislative bills and executive orders of states and counties on the implementation of the “Ban-the-Box” policy or the Fair Chance Act. We collected data on the effective date of the policy and whether the policy included public, private, and/or contract employers, as shown in Table 1.⁵ Our analyses consider “Ban-the-Box” policies for public employers effective by December 2015, which results in 18 states and 133 counties that implement the “Ban-the-Box” policy.

[Insert Table 1 Here]

We measured entrepreneurship by examining whether a survey respondent reported their job as “self-employed”. The NLSY97 surveys explicitly define self-employment as: “self-employed jobs are where you own your own business (for example, a lawn service) or where you do the same type of task for many different people (designing web sites, for instance). In self-employed jobs, you are your own boss”.⁶ This definition of self-employment is consistent with those used in surveys such as the Current Population Survey (CPS), the official source of data on employment and unemployment in the United States, as well as previous studies of entrepreneurship (e.g., Light 1972, Portes and Zhou 1996, Yang and Aldrich 2014, Evans and Leighton 1989, Hegde and Tumlinson 2015). In order to exclude short-term self-employment stints or freelancing that are unlikely to be actual entrepreneurship, we only include self-employment spells that last more than 4 weeks to measure entrepreneurship. As a result, on average 9.23 percent of the survey respondents were self-employed each year and 32.62 percent of the survey respondents had at least once experienced self-employment throughout the survey rounds. The statistics from our sample are comparable with CPS, which reports self-employment

⁵ When information about a policy’s effective date was available, we used that date as the start date of the policy; otherwise we used the date the policy was announced or passed by the legislature. If only the year (month) of implementation was available, we used January 1 of that year (the first of that month) as the start date.

⁶ NLSY variable codebook on self-employment can be found: <https://www.nlsinfo.org/sites/nlsinfo.org/files/attachments/17036/NLSY97R17Employment.html>

rates in the United States were approximately 10 – 11 percent during this period (Hippel 2010). For robustness, we also measured entrepreneurship as (a) the subset of self-employed individuals who report owning an incorporated business and (b) the subset of self-employed individuals who report having employees. Our results are consistent throughout.

Prior incarceration is measured by whether the survey respondent served time in a correctional institution. The NLSY97 documents monthly status of whether the respondent was incarcerated or not in each month of the year, collected yearly from 1992 to 2015. The prior incarceration variable is 1 if the respondent responded as previously incarcerated in any months of year $t-1$ or earlier, and 0 otherwise. This prior incarceration variable provides the key information needed to estimate the effect of incarceration after release. We find that on average 1.59 percent of the survey respondents were currently incarcerated each year and 9.34 percent have been incarcerated at least once during the years 1992 to 2015. This is similar to statistics from other studies and samples, where the percentage of those that have been previously incarcerated range from 7.8 percent to 9.2 percent (Western 2002, Bonczar and Beck 1997). The accuracy of incarceration as measured in the NLSY has been further assessed by Western (2002) that shows comparable incarceration trends between the NLSY survey data and aggregate data from the CPS and BJS administrative data. Individuals were excluded from analyses in the years when they were currently incarcerated as they are unable to participate in employment or entrepreneurship. Current incarceration status can also be controlled for by adding a variable measuring whether respondent was incarcerated in current year t . This approach yields substantively identical results.

We measured recidivism by examining whether a formerly incarcerated individual is reincarcerated after release from prison or jail. There has been active discussion on how to

effectively measure recidivism, as recidivism has been a “fruit salad concept” measured in a variety of ways by different scholars (Beck 2001). While recidivism is conceptually defined as “reengaging in criminal behavior after receiving a sanction or undergoing an intervention for a previous crime” (National Institute of Justice 2014, Johnson 2017), there is considerable disagreement on how to operationalize this concept in terms of the scope of criminal behavior and the time frame. Some scholars broadly define recidivism by counting any new contact with the criminal justice system, including minor offenses and rearrests for technical violations (Bureau of Justice Statistics 2016, United States Sentencing Commission 2016). Yet other scholars argue that recidivism should be more narrowly defined as the commission of a new serious offense, resulting in a new sentence (Administrative Office of the U.S. Courts, 2015). Our study follows this second school of thought and measures recidivism as the re-incarceration of formerly incarcerated individuals for a new offense after release from their previous sentence. We find that 32.2 percent of formerly incarcerated individuals fall into recidivism under this measure. For robustness, we also measure recidivism as the re-arrest of formerly incarcerated individuals for a new offense after release, which yields 44.28 percent recidivism rates. Both measures are consistent with the average recidivism rate in the United States found by other scholars (e.g. Bureau of Justice Statistics 2018), and we find identical results with both measures of recidivism.

Earnings is measured as yearly income and logged yearly income for robustness. The NLSY97 surveys report income after checking the information against the individuals’ information gathered from Employer Surveys and Current Population Surveys (CPS). It is possible that entrepreneurs’ incomes and wealth are higher, not because they are compensated more for their work, but because they work more (Hegde & Tumilson 2018). Therefore, we

conducted robustness checks by measuring individual earnings through their log hourly pay rates and find consistent results. Finally, according to some scholars, entrepreneurs under-report their income by as much as 30 percent (Sarada 2010). Therefore, we also use the reported net worth of respondents as a measure of their overall wealth and find consistent results.

The NLSY 97 categorizes race and ethnicity as Black, Hispanic, Asian, White, and mixed race. Our sample holds 25.99 percent Blacks, 21.16 percent Hispanics, 1.78 percent Asians, and 50.19 percent Whites, and 0.92 percent mixed race. We control for each race and ethnicity by adding dummy variables for all race categories except Whites, the omitted category. For most of our analyses, we include individual-level fixed effects that control for race. We also examine sub-samples by race, as past scholarship on labor market discrimination and incarceration suggests that the main effects for each race may differ (Western 2002, Pager 2003). Indeed, we observe substantially different likelihoods of incarceration by race: 13.10 percent of Blacks, 9.26 percent of Hispanics, 4.38 percent of Asians, 7.42 percent of Whites, 13.25 percent of mixed race were ever incarcerated. We also control for gender. In our sample 48.80 percent are female. Female respondents and male respondents also show different likelihood of incarceration, as 3.76 percent of the female respondents were ever incarcerated, compared to 14.66 percent of the male respondents.

We account for individual-level human capital differences that may affect either the likelihood of being incarcerated or selection into entrepreneurship and employment. Specifically, we include variables on individual educational attainment and cognitive ability. We measured educational attainment by the log years of total education completed. We find similar results when measuring educational attainment as the highest educational degree attained. Cognitive ability of individuals is measured by the percentiles generated from the Armed Services

Vocational Aptitude Battery (ASVAB) Test scores. The ASVAB Test or the composite percentile generated from this test (Armed Forces Qualification Test Score), has been used to measure the cognitive ability of individuals in the setting of both incarceration and entrepreneurship (Western 2002, Fairlie 2002, Hegde and Tumilson 2018). The ASVAB Test measures the respondent's knowledge and skills in the topical areas of Arithmetic Reasoning, Math Knowledge, Word Knowledge, and Paragraph Comprehension. The NLSY respondents took the ASVAB from the summer of 1997 through the spring of 1998 when they were 12 to 18 years of age. We use the age-adjusted percentiles of the ASVAB test scores, which were generated using the procedures described in the NLSY 97 Codebook Supplement Appendix 10.⁷

We also control for lagged yearly individual and family income, as scholars have found wealth to drive decisions to engage in entrepreneurship by providing resources that facilitate both the founding and management of a business (Renzulli, Aldrich, and Moody 2000, Evans and Jovanovic, 1989; Evans and Leighton, 1989). We measure lagged yearly individual and family income through annual survey questions that address respondents' own and total family income in the previous year. We also control for the number of months worked, including both self-employment and employment, in the previous year. We also control for the local unemployment rate at the MSA-level, as the unemployment rate of the local area of residence may affect the respondent's employment and entrepreneurship opportunities in addition to incarceration. Finally, we include year and county (MSA) level fixed effects.

⁷ NLSY 97 Codebook Supplement Appendix 10 can be found here: <https://www.nlsinfo.org/content/cohorts/nlsy97/other-documentation/codebook-supplement/appendix-10-cat-asvab-scores>

Table 2 shows the descriptive statistics of the main variables from year 1997 to 2015. The first section of Table 2 provides the statistics for the full individual-year sample with 170,696 observations, while the second section of Table 2 provides the statistics for variables that apply to only formerly incarcerated individuals with 7,369 observations. Table 3 further provides illustrative statistics for one year, 2010. This table shows the individual-level statistics for all individuals, individuals who are never incarcerated, and those who have been formerly incarcerated, sorted by race. The raw statistics show that entrepreneurship rates among formerly incarcerated individuals is higher than for those never incarcerated, supporting our theory.

[Insert Table 2 Here]

[Insert Table 3 Here]

METHODS

To study incarceration and entrepreneurship, we conduct a series of OLS regression analyses. First, we estimate the probability that an individual engages in entrepreneurship as a function of former incarceration, race, and other control variables such as cognitive ability, education, and prior income through the main model:

$$Entrepreneurship_{it} = \alpha + \beta_1 Past_Incarceration_{it} + \beta_2 X_{it} + \epsilon_{it}$$

where $Entrepreneurship_{it}$ represents whether survey respondent i engaged in entrepreneurship at year t for the period 1997-2015, $Past_Incarceration_{it}$ measures whether respondent i was formerly incarcerated at time t , X_{it} is a vector of other individual level control variables, and

ϵ_{it} is an error term. For this model, incarceration produces a shift in the probability of entrepreneurial engagement by β_1 percent.

Yet, it is difficult to interpret the results from this model as the causal effect of incarceration on entrepreneurship, because of the nonrandom selection of individuals into incarceration. Preexisting characteristics of formerly incarcerated individuals that place them at high risk of incarceration may also affect their likelihood of engaging in entrepreneurship. The increase of entrepreneurship for formerly incarcerated individuals may be a function of preexisting traits of formerly incarcerated individuals (e.g. risk preference, entrepreneurial ability, poor interpersonal skills) instead of the “treatment” effect of incarceration itself. Furthermore, it is difficult to formally identify explanatory mechanisms through the analysis of incarceration and subsequent entrepreneurship outcomes. Pager (2003) raises similar limitations of the difficulty of parsing out underlying mechanisms for studies on incarceration and subsequent employment outcomes. While researchers have offered numerous mechanisms that may explain the observed relationship between incarceration and employment such as the influence on social networks (Hagan 1993), the loss of human capital (Becker 1975), institutional trauma (Parenti 1999), and legal barriers to employment (Dale 1976), it has been difficult to discern which of these causal mechanisms are at work. Therefore, in order to identify a causal relationship between incarceration and entrepreneurship and to establish the explanatory mechanism, this paper utilizes several research designs and a unique empirical setting.

Firstly, we conduct fixed effects regression models. We include individual-level fixed effects to absorb time-invariant, observed and unobserved, individual traits such as cognitive ability, personality, impulsivity, risk preferences, and fixed demographic characteristics such as race and gender (Caspi et al. 1998). By including the individual fixed effects, we are able to

observe within individual changes of entrepreneurship and employment choices, before and after being incarcerated. We also include year fixed effects to capture any time trends and MSA (county) fixed effects to control for differences between regions.

In addition to fixed effects, we exploit a quasi-natural experiment provided by an exogenous policy shock and a triple-difference regression analysis. Specifically, we use the staggered enactment of a policy widely known as “Ban-the-Box”, a county and state-level law barring employers from examining job applicants’ criminal records until later in the hiring process. As of 2019, the “Ban-the-Box” policy has been staggeredly adopted in 35 states, Washington D.C., and 170 cities and counties in the United States for public employers, spanning 21 years. Among these localities, 13 states, Washington D.C., and 18 cities and counties have extended their “Ban-the-Box” policy to private employers as well. Due to the limited adoption of “Ban-the-Box” policy for private employers before 2015, our analysis in this paper focuses primarily on the effects of implementing at least a public “Ban-the-Box” policy. Table 1 shows the list of states, cities, and counties that have adopted the “Ban-the-Box” policy and the effective dates.

We are able to leverage the staggered adoption of “Ban-the-Box” to identify the causal mechanism of incarceration on entrepreneurship for several reasons. Firstly, the implementation of this policy exogenously increases employment opportunities for formerly incarcerated individuals in impacted localities. This initiative provides formerly incarcerated job applicants a better chance at employment by removing the conviction history question from job applications and allowing employers to judge applicants on their qualifications without the stigma of a record (Craigie 2020, Avery and Hernandez 2018, Shoag and Veuger 2016). By comparing the level of entrepreneurship engagement in localities with and without the “Ban-the-Box” policy, we are

able to identify whether labor market discrimination plays a role in formerly incarcerated individuals engaging in entrepreneurship. Furthermore, we are able to identify the differences by race, as “Ban-the-Box” policy is often presented as an important tool for reducing racial disparity by improving access to employment for formerly incarcerated black men (Pinard 2014, Clarke 2012). We find supportive evidence from our sample that the enactment of the “Ban-the-Box” policy does in fact increase employment for formerly incarcerated individuals, particularly black formerly incarcerated individuals, as will be discussed in the Results section of the paper (refer to Table 5 and Figure 1).

Moreover, the implementation of the “Ban-the-Box” policy offers a unique setting to tease apart the causal mechanism of the effect of incarceration on entrepreneurship. The adoption of “Ban-the-Box” policy has no direct correlation with entrepreneurship, other than through the policy’s impact on labor market discrimination for formerly incarcerated individuals. The “Ban-the-Box” policy does not affect other possible causal mechanisms such as social networks, loss of human capital, or institutional trauma that are known to influence formerly incarcerated individuals in their labor market choices. In other words, the adoption of the “Ban-the-Box” law serves as a unique proxy for the change (i.e. decrease) in the level of employer discrimination for formerly incarcerated individuals in a given locality after the adoption of the ban.

We also exploit the variation in the timing of “Ban-the-Box” implementation in a triple difference design, to address the concern of whether the adoption of the “Ban-the-Box” policy is a function of a locality’s entrepreneurship rate, employment rate, or other unobservable traits. Our triple difference regression model mitigates such concerns, as we compare the changes in entrepreneurship for formerly incarcerated individuals relative to the changes in entrepreneurship for non-formerly incarcerated individuals, in “Ban-the-Box” localities versus non “Ban-the-Box”

localities, after “Ban-the-Box” policies go into effect. We further validate that the treatment (“Ban-the-Box” implemented) and control (non “Ban-the-Box” implemented) localities had no preexisting trends in entrepreneurship or employment for formerly incarcerated and non-formerly incarcerated individuals before the year of the policy adoption, suggesting that adoption of “Ban-the-Box” policy was not an endogenous choice based on entrepreneurship or employment trends (refer to Figure 1 & Figure 2).

Specifically, we run a triple difference regression by using the model:

$$\begin{aligned}
 & Entrepreneurship_{it} = \\
 & \alpha + \beta_1 PastIncarceration_{it} + \beta_2 BantheBox_{it} + \beta_3 PastIncarceration_{it} * BantheBox_{it} + \\
 & c_i + c_t + c_{region} + \beta_4 X_{it} + \epsilon_{it}
 \end{aligned}$$

where $Entrepreneurship_{it}$ represents whether survey respondent i engaged in entrepreneurship at year t for the period 1997-2015, $PastIncarceration_{it}$ measures whether respondent i was formerly incarcerated at time t , $BantheBox_{it}$ is 1 when the county or state of residence for respondent i at time t has adopted the “Ban-the-Box” policy and 0 otherwise, $PastIncarceration_{it} * BantheBox_{it}$ is the interaction of prior incarceration and the enactment of “Ban-the-Box” policy, c_i, c_t, c_{region} are fixed effects at the individual-level, year-level, and MSA (county) level respectively, X_{it} is a vector of time-variant control variables, and ϵ_{it} is an error term.⁸

Although our methodology of utilizing the triple difference method before and after an exogenous policy shock addresses most endogeneity problems, for robustness we utilize a

⁸ The triple difference specification follows Imbens and Woodridge (NBER, 2007).

matching method in order to address remaining concerns about non-random selection into incarceration. As formerly incarcerated individuals may be very different from the comparison group of individuals without an incarceration record, our matching method helps to restrict the “control group” to people similar to the “treatment group” (formerly incarcerated individuals), except that this “control group” has not been “treated” (incarcerated) (Western 2002). We utilize three different matching methods, (1) coarsened exact matching (CEM), (2) propensity score matching (PSM), and (3) matching the treatment group of formerly incarcerated individuals to formerly arrested yet not incarcerated individuals. The three types of matching are different in methods, but all aim to address the issue of non-comparable treatment and control group. Through CEM and PSM matching, we use an extensive set of variables such as demographics, education, family background, and residence area in order to create an observationally similar comparison group. For our third matching, we match the treatment group of formerly incarcerated individuals to the subset of the control group who have an arrest record but have not been incarcerated. All three of our matching methods show that after matching, the treatment group and control group are similar in terms of the extensive set of variables used for matching. (Refer to Appendix)

RESULTS

Table 4 shows the results on how incarceration affects entrepreneurship. Our results show that formerly incarcerated individuals are more likely to become entrepreneurs compared to individuals without a criminal record. The results show that having been formerly incarcerated increased one’s likelihood of becoming an entrepreneur by 5.9 percent (Table 4 Model 1). This is

true controlling for education, cognitive ability test scores, family and individual income (t-1), number of months employed (t-1), gender, and race (Table 4 Model 2). While the average individual without a criminal record has 7.09 percent likelihood of becoming an entrepreneur, similar individuals with a criminal record are more than 50 percent more likely to choose entrepreneurship with a 12.69 percent likelihood of becoming an entrepreneur (Table 4 Model 2). Table 4 Model 3 shows similar results when adding individual fixed effects. We find consistent results when measuring entrepreneurship as incorporated self-employment (Table 4 Model 4) and self-employment with employees (Table 4 Model 5).

[Insert Table 4 Here]

Table 5 and Table 6 show the triple difference analyses with the staggered implementation of the “Ban-the-Box” policy. Through the results we are able to make a causal claim, and also unpack an underlying mechanism of why formerly incarcerated individuals choose entrepreneurship at higher rates compared to individuals who have not been to prison or jail. First, in Table 5 we test the effects of the “Ban-the-Box” policy on employment for formerly incarcerated individuals, by examining the number of months employed per year in the paid-employment sector. While the average individual without a criminal record works in paid employment for 7.18 months in a year, past incarceration decreases employment by 0.52 months (7.2 percent) after release (Table 5 Model 1). However, the negative impact of incarceration on employment is mitigated when “Ban-the-Box” policy is implemented, as employment for formerly incarcerated individuals increase by 0.4 months in states or counties where the policy is adopted (Table 5 Model 1). Formerly incarcerated individuals still face discrimination from employers when residing in states or counties with “Ban-the-Box” policy, but they are more likely to be employed compared to before the implementation of “Ban-the-Box” policy.

[Insert Table 5 Here]

Figure 1 summarizes the effect of “Ban-the-Box” policy on employment for formerly incarcerated individuals. The solid horizontal line represents the baseline employment of formerly incarcerated individuals in states and counties that never implement “Ban-the-Box” policy. The dashed line shows employment for formerly incarcerated individuals in states and counties that implement “Ban-the-Box” policy at time T (labeled “Ban-the-Box”). The figure shows that the two lines overlap during T-2 and T-1, confirming that “Ban-the-Box” policy was indeed exogenous without any pre-trends between the counties and states that implemented and did not implement “Ban-the-Box” policy. Also, Figure 1 shows that at time T, when “Ban-the-Box” policy is implemented, employment for formerly incarcerated individuals sharply increased in counties and states that implement Ban-the-Box. This increase of employment for formerly incarcerated individuals in “Ban-the-Box” implemented counties and states continues after time T. These results suggest that (1) “Ban-the-Box” policy implementation is an exogenous shock to employment for formerly incarcerated individuals, and that (2) “Ban-the-Box” policy helps mitigate labor market discrimination for formerly incarcerated individuals.

[Insert Figure 1 Here]

Furthermore, we find differential effects of incarceration and “Ban-the-Box” policy by race. We divide the sample into black and white population in order to examine how past incarceration and “Ban-the-Box” policy affects employment opportunities differently by race. Models 2 and 3 of Table 5 show that black formerly incarcerated individuals face greater discrimination from employers compared to white formerly incarcerated individuals, supporting previous findings (Pager 2003). Specifically, our results show that while the average black individual without a criminal record works in paid employment for 6.55 months in a year, black

formerly incarcerated individuals are employed 0.83 months (12.7 percent) less (Table 5 Model 2). The average white individual without a criminal record works in paid employment for 7.46 months in a year, and a criminal record decreases employment by 0.49 months (6.6 percent) (Table 5 Model 2). Interestingly, the adoption of “Ban-the-Box” mitigates such employment discrimination for black formerly incarcerated individuals, but does not significantly increase employment for white formerly incarcerated individuals.⁹ Thus, the “Ban-the-Box” policy has the greatest positive employment impact on the individuals who face the greatest discrimination from employers: black formerly incarcerated individuals.

Table 6 shows the triple difference OLS result for entrepreneurship, where evidence for our causal mechanism is indicated by lower entrepreneurship rates for formerly incarcerated individuals after “Ban-the-Box” is adopted. Table 6 Model 1 provides consistent results as Table 4, showing that past incarceration increases one’s likelihood of engaging in entrepreneurship by 4.9 percent, compared to non-formerly incarcerated individuals. Yet, the coefficient for the interaction of “Past Incarceration” and “Ban-the-Box” indicates that the exogenous implementation of “Ban-the-Box” does not significantly change the incarceration effect on the likelihood of entrepreneurial entry.

In order to probe deeper, we conduct sub-sample analyses by race (Table 6 Model 2 and Model 3). The sub-sample analyses show that formerly incarcerated individuals are less likely to take part in entrepreneurship when “Ban-the-Box” policy is adopted, but only for the black formerly incarcerated population. This is consistent with past scholarship, as well as the results from Table 5 which show evidence that not only are black formerly incarcerated individuals the

⁹ We find that “Ban-the-Box” policy negatively impacts non-formerly incarcerated black individuals, by decreasing their employment. This result speaks to prior research on “Ban-the-Box” employment effects such as Agan and Starr (2017) and Doleac and Hansen (2017). We discuss further in the Discussion section of this paper.

most discriminated against in the labor market, but also experience the greatest increase in labor market opportunities through Ban-the-Box. Overall, the results from Table 6 show that black formerly incarcerated individuals, those who face the most discrimination from employers and the greatest employment benefits from Ban-the-Box, are less likely to take part in entrepreneurship when “Ban-the-Box” is implemented. This supports our central thesis that formerly incarcerated individuals are more likely to pursue entrepreneurship as an alternative route to avoid labor market discrimination.¹⁰

[Insert Table 6 Here]

Figure 2 clearly summarizes the effect of “Ban-the-Box” policy on entrepreneurship for formerly incarcerated individuals. The solid horizontal line at zero represents the baseline entrepreneurship likelihood of formerly incarcerated individuals in states and counties that never implemented “Ban-the-Box” policy. The dashed line shows the relative entrepreneurship likelihood of formerly incarcerated individuals in states and counties that implement “Ban-the-Box” policy at time T (labeled “Ban-the-Box”). Similar to Figure 1, Figure 2 shows that the two lines overlap during T-2, T-1, confirming that “Ban-the-Box” policy is indeed exogenous without any pre-trends between the counties and states that implemented and did not implement “Ban-the-Box” policy. Also, Figure 2 shows that at time T+1, a year after “Ban-the-Box” policy is implemented, entrepreneurship for formerly incarcerated individuals sharply decreases in counties and states that implement Ban-the-Box. This decrease of entrepreneurship for formerly incarcerated individuals in “Ban-the-Box” implemented counties and states continues on after

¹⁰ We interpret the increase of entrepreneurship for non-formerly incarcerated black individuals after “Ban-the-Box” policy implementation to be the impact of “Ban-the-Box” policy decreasing employment for this population. This is in line with our overall theory that individuals are pushed into entrepreneurship due to the lack of work opportunities in the labor market.

time T+1. These results show support for our hypotheses that formerly incarcerated individuals transition into entrepreneurship because of labor market discrimination, and that the mitigation of discrimination negatively impacts entrepreneurial entry.

[Insert Figure 2 Here]

Next, Table 7 shows the results on how past incarceration and entrepreneurship affects annual income in dollars. Table 7 Model 1 first shows that incarceration has a significant negative impact on yearly income. Specifically, in terms of yearly income in dollars, entrepreneurs with a criminal record earn approximately 2,700 dollars more than employees with a criminal record. Furthermore, while employees with a criminal record earn approximately 7,000 dollars less than employees without a criminal record each year, entrepreneurs with a criminal record earn only 4,300 dollars less each year than entrepreneurs without a criminal record.¹¹ Thus although formerly incarcerated individuals still earn significantly less than non-formerly incarcerated individuals in entrepreneurship, the income penalty from past incarceration decreases by 38.6 percent. Table 7 Model 2 and Model 3 show consistent results for the subsamples by race. These results support our theory that the income penalty that formerly incarcerated individuals face due to labor market discrimination and stigma can be mitigated by taking part in entrepreneurship. Particularly, our results that a portion of the income gap remains from incarceration even in entrepreneurship seems to suggest evidence for individual-level effects of incarceration such as the human capital or social capital erosion. Thus, entrepreneurship helps formerly incarcerated individuals overcome the institutional level effects

¹¹ The results are similar when using 3-year average income.

of labor market discrimination. For robustness, we test and find consistent results with logged yearly income, logged hourly pay rate, and net worth.

[Insert Table 7 Here]

Lastly, Table 8 shows results for the effect of entrepreneurship on recidivism rates for formerly incarcerated individuals. We find supportive evidence that entrepreneurship helps prevent formerly incarcerated individuals from returning to prison, beyond the effect of employment. Model 1 of Table 8 shows that entrepreneurship decreases the likelihood of recidivism (measured by re-incarceration) by 5.3 percent, which is a 32.5 percent decrease from the average recidivism rate for formerly incarcerated individuals who are employees. Model 1 supports previous research with results that show longer incarceration length increases recidivism while the number of years since release from incarceration decreases recidivism. The sub-sample analyses by race shows interesting results that entrepreneurship helps desist further crime, only for black formerly incarcerated individuals (Table 8 Model 2 and Model 3). This is consistent with our theory that entrepreneurship is most helpful as an alternative route for work for those facing the most discrimination in the labor market: black formerly incarcerated individuals. Table 8 Model 4 shows consistent results with Model 1, by measuring recidivism as re-arrests.

[Insert Table 8 Here]

DISCUSSION & FUTURE DIRECTIONS

Our study shows that people who have spent time in prison are more likely to become entrepreneurs compared to similar individuals who have not been incarcerated, signifying

entrepreneurship as a meaningful choice for formerly incarcerated individuals. Through our quasi-experiment design, we verify an underlying mechanism that formerly incarcerated individuals choose to become entrepreneurs because of the lack of employment opportunities in the labor market. In addition, we find evidence that entrepreneurship offers formerly incarcerated individuals the chance to overcome both economic and social barriers to successful reentry by decreasing the income gap and recidivism rates.

These findings offer a modification to a prevailing narrative on formerly incarcerated individuals, which has emphasized labor market discrimination and its adverse consequences on subsequent reentry. Consistent with this narrative, we verify past scholarship that points to the value of employment. However, we extend this research by drawing attention to entrepreneurship as an alternative labor market choice that formerly incarcerated individuals can pursue to mitigate the stigma associated with the mark of a criminal record. Entrepreneurship not only helps formerly incarcerated people find work and gain competitive income, but also lowers the likelihood of returning to prison. While employment remains an important channel to successful reentry, we introduce entrepreneurship as an alternative way formerly incarcerated people can achieve both economic and social reintegration.

Our study speaks to the important discussion on the intersection of race and incarceration, by underlining the significance of race in the role of entrepreneurship for formerly incarcerated people. Our results support prior research on the persistent racial inequality in employment opportunities for formerly incarcerated individuals by showing that African American (black) individuals with a criminal record are those who face the highest employment barriers. Yet, our findings that black formerly incarcerated individuals reap the greatest advantages from entrepreneurship, emphasizes that entrepreneurship offers the opportunity for economic and

social integration, particularly for those who face the greatest stigma and discrimination in the labor market - African Americans.

Our quasi-experimental study design allows us to disentangle the underlying mechanism and offer direct causal evidence of incarceration on entrepreneurship. While survey research can have limitations of indirect estimates of effects, our research design utilizes an exogenous policy shock with a triple-difference method. This allows a direct and causal measure of a criminal record and labor market discrimination as a mechanism that drives entrepreneurial decisions. This methodology allows us to effectively isolate the institutional effect from the individual effect of incarceration, and identify entrepreneurship as a response to labor market discrimination and stigma.

Addressing this important channel of reentry for formerly incarcerated individuals not only contributes to research but also has implications for policymakers and practitioners. Examining entrepreneurship as a valid opportunity for formerly incarcerated individuals may draw attention to the importance of investing in programs and policies to facilitate post-incarceration entrepreneurial activities, as well as better understand discrimination in employment markets. As many studies have found that the lack of employment influences formerly incarcerated individuals to return to prison, this study draws attention to the importance of entrepreneurship as a way of decreasing recidivism. While there have been recent policy initiatives such as the New Start Act (Marks 2019) and efforts from non-profit organizations and educational institutions, our study is one of the first research studies to emphasize the need for attention to entrepreneurship for formerly incarcerated people.

Relatedly, our paper has theoretical implications on public policies that affect people with disadvantages, such as a criminal record. For example, our research speaks to the discussion around the “Ban-the-Box” policy. Scholars, policy makers, and practitioners have debated the effects of the “Ban-the-Box” policy, with serious disagreement. While some have argued that “Ban-the-Box” policy increases discrimination against racial minorities (Agan and Starr 2018; Doleac and Hansen 2018), others have found counter evidence suggesting that this policy reduces discrimination (Craigie 2020, Pinard 2014, Southern Coalition for Social Justice 2013, Clarke 2012, and Community Catalyst 2013) or negligible effects (Rose 2019). While our research is not designed to assess the impact and effectiveness of the “Ban-the-Box” policy, we offer some findings that relate to this conversation. In our study, we are able to observe individuals with a criminal record before and after “Ban-the-Box” policy enactments, which has been difficult in audit studies with fictitious job applicants (Agan and Starr 2018) and Current Population Survey studies that don’t report incarceration variables (Doleac and Hansen 2018). By being able to separately observe formerly and non-formerly incarcerated individuals after “Ban-the-Box” policy, we are able to more accurately assess the policy implications for each different group. We find that “Ban-the-Box” increases employment for formerly incarcerated individuals (both black and white), and that “Ban-the-Box” has a significant negative effect on the employment outcomes of African Americans who have not been incarcerated. While this finding is a result of our specific sample, research design, and measurement of employment (number of months employed), our findings suggest the need for more studies to investigate the impact of “Ban-the-Box” policies on both formerly incarcerated and non-formerly incarcerated individuals.

This study also provides contribution to work on incarceration as one of the first papers to address entrepreneurship of formerly incarcerated people. While recent studies have started to examine entrepreneurship for formerly incarcerated individuals through qualitative analyses of entrepreneurial training programs in prisons (e.g. Cooney 2012), our study is the first study to offer quantitative analyses on entrepreneurial transitions and outcomes for formerly incarcerated individuals. We believe our research opens future research possibilities on formerly incarcerated entrepreneurs. For example, scholars should examine the entrepreneurial process of formerly incarcerated individuals and how the entrepreneurial experience of formerly incarcerated people impacts their future employment prospects.

An increasing number of individuals are returning back to society from prisons and jails as a consequence of mass incarceration. Thus, it becomes increasingly important to consider the impact of incarceration on reentry and how formerly incarcerated individuals can overcome the common pathway to unemployment and recidivism. Our paper is an initial attempt to introduce entrepreneurship as an alternative response to the poor employment outcomes and labor market discrimination that await formerly incarcerated individuals. Future research is needed to expand this emphasis on entrepreneurship by exploring the antecedents, process, and diverse outcomes of entrepreneurship for formerly incarcerated individuals. In this way, we can move toward a more complete understanding of the labor market choices that formerly incarcerated individuals can make in order to successfully reenter and remain in the society.

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Table 1 Ban the Box Policies implemented by December 2018

State	Jurisdiction	Public	Start Date	Private	Start Date	Contract	Start Date
Alabama	Birmingham	1	2016.02.04				
Arizona	State	1	2017.11.06				
	Coconino County	1	2017.05.10				
	Glendale	1	2015.09.01				
	Maricopa County	1	2018.01.01				
	Pima County	1	2015.11.10				
	Phoenix	1	2016.04.18				
	Tempe	1	2016.09.22				
	Tucson	1	2014.08.27				
Arkansas	Pulaski County	1	2016.06.28				
California	State	1	2010.06.25	1	2017.10.14		
	Alameda County	1	2007.03.01				
	Berkeley	1	2008.10.01				
	Carson	1	2012.03.06				
	Compton	1	2011.07.01			1	2011.07.01
	East Palo Alto	1	2005.01.01				
	Los Angeles	1	2016.12.09	1	2016.12.09	1	2016.12.09
	Oakland	1	2007.01.01				
	Pasadena	1	2013.07.01				
	Richmond	1	2011.11.22			1	2013.07.30
	Sacramento					1	2017.01.01
	San Francisco	1	2005.10.11	1	2014.04.04	1	2014.04.04
	Santa Clara County	1	2012.05.01				
Colorado	State	1	2012.08.08				
	Denver	1	2016.07.11				
Connecticut	State	1	2010.10.01	1	2017.01.01		
	Bridgeport	1	2009.10.05				
	Hartford	1	2009.06.12			1	2009.06.12
	New Haven	1	2009.02.01			1	2009.02.01
	Norwich	1	2008.12.01				
Delaware	State	1	2014.05.08				
	New Castle County	1	2014.01.28				
	Wilmington	1	2012.12.10				
District of Columbia	District of Columbia	1	2011.01.01	1	2014.07.14		
Florida	Broward County	1	2016.06.14				
	Clearwater	1	2013.01.01				
	Daytona Beach	1	2015.07.01				
	Fort Myers	1	2015.12.07				
	Gainesville	1	2015.11.19				
	Jacksonville	1	2009.07.08				
	Miami Dade County	1	2015.10.06				
	Orlando	1	2015.05.15.				
	Pompano Beach	1	2014.12.01				
	Sarasota	1	2016.05.01				
	St Petersburg	1	2015.01.01				
	Tampa	1	2013.01.14				
	Tallahassee	1	2015.01.28				

Georgia	State	1	2015.02.23				
	Albany	1	2015.03.24				
	Atlanta	1	2013.01.01				
	Augusta	1	2017.01.17				
	Cherokee County	1	2016.03.01				
	Columbus	1	2015.03.29				
	Fulton County	1	2014.07.16				
	Macon Bibb County	1	2015.02.17				
Hawaii	State	1	1998.01.01	1	1998.01.01	1	1998.01.01
Illinois	State	1	2014.01.01	1	2014.07.19	1	2014.07.19
	Chicago	1	2007.06.06	1	2014.11.05	1	2014.11.05
Indiana	State	1	2017.07.01				
	Indianapolis	1	2014.05.25			1	2014.05.25
Kansas	Johnson County	1	2016.05.19				
	Kansas City	1	2014.11.06				
	Wyandotte County	1	2014.11.06				
	Topeka	1	2015.07.01				
	Wichita	1	2017.07.09				
Kentucky	State	1	2017.02.01				
	Louisville	1	2014.03.13			1	2014.03.13
Louisiana	State	1	2016.08.01				
	Baton Rouge	1	2015.11.10				
	New Orleans	1	2014.01.10				
Maryland	State	1	2013.10.01				
	Baltimore	1	2007.12.01	1	2014.04.01	1	2014.04.01
	Montgomery County	1	2015.01.01	1	2015.01.01	1	2015.01.01
	Prince George's County	1	2015.04.14	1	2015.04.14		
Massachusetts	State	1	2010.11.04	1	2010.11.04		
	Boston	1	2006.07.01			1	2006.07.01
	Cambridge	1	2007.05.01			1	2008.01.28
	Worcester	1	2009.06.23			1	2009.06.23
Michigan	Ann Arbor	1	2014.05.05				
	Detroit	1	2010.09.13			1	2012.06.01
	East Lansing	1	2014.04.15				
	Genesee County	1	2014.06.01				
	Kalamazoo	1	2010.01.01			1	2016.05.16
	Muskegon County	1	2012.01.12				
Minnesota	State	1	2009.01.01	1	2013.05.13	1	2009.01.01
	Minneapolis	1	2006.12.01				
	St Paul	1	2006.12.05				
Missouri	State	1	2016.04.11				
	Columbia	1	2014.12.01	1	2014.12.01	1	2014.12.01
	Jackson County	1	2016.11.06				
	Kansas City	1	2013.04.04	1	2018.06.09		
	St Louis	1	2014.10.01				
Nebraska	State	1	2014.04.16				
Nevada	State	1	2018.01.01				
	North Las Vegas	1	2017.02.09				

New Jersey	State	1	2015.03.01	1	2015.03.01		
	Atlantic City	1	2011.12.23			1	2011.12.23
	Newark	1	2012.09.19	1	2012.09.19	1	2012.09.19
New Mexico	State	1	2010.05.19				
New York	State	1	2015.09.21				
	Albany County	1	2017.02.13				
	Buffalo	1	2013.06.11	1	2013.06.11	1	2013.06.11
	Dutchess County	1	2016.01.19				
	Ithaca	1	2015.12.23				
	Kingston	1	2015.09.01				
	Newburgh	1	2015.08.10				
	New York City	1	2011.10.13	1	2015.10.27	1	2011.10.13
	Rochester	1	2014.05.20	1	2014.05.20	1	2014.05.20
	Syracuse	1	2015.03.22			1	2015.03.22
	Tompkins County	1	2016.07.05				
	Ulster County	1	2015.01.01				
	Woodstock	1	2014.11.18				
	Yonkers	1	2014.11.01				
North Carolina	Ashville	1	2016.01.19				
	Buncombe County	1	2016.04.19				
	Carrboro	1	2012.10.16				
	Charlotte	1	2014.02.28				
	Cumberland County	1	2011.09.06				
	Durham County	1	2012.10.01				
	Durham City	1	2011.02.01				
	Forsyth County	1	2018.04.12				
	Mecklenburg County	1	2016.03.16				
	Spring Lake	1	2012.06.25				
	Wake County	1	2016.05.01				
Ohio	State	1	2016.03.23				
	Akron	1	2013.10.29				
	Alliance	1	2014.12.01				
	Canton	1	2013.05.15				
	Cincinnati	1	2010.08.01				
	Cleveland	1	2011.09.26				
	Cuyahoga County	1	2012.09.30				
	Daytona Beach	1	2015.07.01				
	Franklin County	1	2012.06.19				
	Hamilton County	1	2012.03.01				
	Lucas County	1	2013.10.29				
	Massillon	1	2014.01.03				
	Newark	1	2015.07.20				
	Stark County	1	2013.05.01				
	Summit County	1	2012.09.01				
	Warren	1	2015.01.14				
	Youngstown	1	2014.03.19				
Oklahoma	State	1	2016.02.24				
Oregon	State	1	2016.01.01	1	2016.01.01		
	Multnomah County	1	2007.10.10				
	Portland	1	2014.07.09	1	2015.11.25		

Pennsylvania	State	1	2017.07.01				
	Allegheny County	1	2014.11.24				
	Allentown	1	2015.04.01				
	Beaver County	1	2018.01.25				
	Bethlehem	1	2016.03.14				
	Lancaster	1	2014.10.01				
	Philadelphia	1	2011.06.29	1	2011.06.29	1	2011.06.29
	Pittsburgh	1	2012.12.17			1	2012.12.17
	Reading	1	2015.03.09				
Rhode Island	State	1	2013.07.15	1	2013.07.15	1	2013.07.15
	Providence	1	2009.04.01				
South Carolina	Spartanburg	1	2017.06.26				
	York County	1	2017.01.17				
Tennessee	State	1	2016.04.14				
	Chattanooga	1	2017.01.07				
	Hamilton County	1	2012.01.01				
	Memphis	1	2010.07.09				
	Nashville	1	2016.01.01				
Texas	Austin	1	2008.10.16	1	2016.03.24		
	Dallas County	1	2015.11.17				
	San Antonio	1	2016.12.07				
	Travis County	1	2008.04.15				
Utah	State	1	2017.05.08				
Vermont	State	1	2015.04.21	1	2017.07.01		
Virginia	State	1	2015.04.03				
	Alexandria	1	2014.03.19				
	Arlington County	1	2014.11.03				
	Blacksburg	1	2016.01.19				
	Charlottesville	1	2014.03.01				
	Danville	1	2014.06.03				
	Fairfax County	1	2014.09.23				
	Fredericksburg	1	2014.01.01				
	Harrisonburg	1	2014.08.26				
	Henry County	1	2016.07.01				
	Montgomery County	1	2016.01.26				
	Newport News	1	2012.10.01				
	Norfolk	1	2013.07.23				
	Petersburg	1	2013.09.03				
	Portsmouth	1	2013.04.01				
	Prince William County	1	2013.03.25				
	Richmond	1	2013.03.25				
	Roanoke	1	2015.01.01				
	Staunton	1	2016.02.25				
	Virginia Beach	1	2013.11.01				
Washington	State	1	2018.06.07	1	2018.06.07		
	Pierce County	1	2012.01.01				
	Seattle	1	2009.04.24	1	2013.01.01	1	2009.04.24
	Spokane	1	2015.03.06	1	2018.06.14		
	Spokane County	1	2017.10.27				
	Tacoma	1	2015.06.30				
Wisconsin	State	1	2016.07.01				
	Dane County	1	2014.02.01				
	Madison	1	2014.09.05			1	2015.11.25
	Milwaukee	1	2011.10.07				
	Milwaukee County	1	2011.10.07				

*As the NLSY 1997 data is only available until year 2015, this paper focuses on the jurisdictions that adopted the Ban-the-Box policy before December 2015. The start dates are the dates of when the policy was made effective in each jurisdiction. Source: National Employment Law Project (2018) and local legislation.

Table 2 Descriptive Statistics of Main Variables used in OLS Regressions, 1997 to 2015

	Mean	Standard Deviation	Min	Max
<i>Full Sample (Individual-Years, N=170,696)</i>				
Entrepreneurship	0.083	0.275	0	1
Past Incarceration	0.043	0.203	0	1
Ln(Years of Education)	2.457	0.165	2.30	3.04
Ln(Yearly Income)	1.738	1.754	-6.91	5.70
Ln(Family Income)	3.644	1.518	-2.00	6.91
Number of Months Worked	6.496	4.586	0	12
MSA Unemployment Rate	6.155	2.633	1	27.80
<i>Sub Sample of Formerly Incarcerated Individuals (Individual-Years, N=7,369)</i>				
Recidivism (Re-incarceration)	0.204	0.403	0	1
Re-arrest	0.334	0.472	0	1
Years Since Release from Incarceration	4.029	3.753	0	18
Number of Years Incarcerated	1.052	1.463	0.083	11.5

Table 3 Descriptive Statistics of Main Variables, 2010

	<i>Full Sample</i>	<i>Never Incarcerated</i>	<i>Formerly Incarcerated</i>
<i>Full Sample</i>			
Past Incarceration	6.7%		
Entrepreneurship	11.4%	11.0%	19.1%
Years of Education	12.74	12.85	11.49
ASVAB Ability Test	55.25	56.23	42.81
Age	27.99	27.98	28.16
Yearly Income in Dollars	25,272	26,081	16,669
Family Income in Dollars	90,224	93,466	49,613
Number of Months Worked	7.36	7.55	6.26
MSA Unemployment Rate	8.63%	8.61%	8.96%
Number of Observations	8,984	8,293	491
<i>Sub-Sample: Black Population</i>			
Past Incarceration	8.8%		
Entrepreneurship	10.9%	10.4%	18.8%
Years of Education	12.35	12.47	11.37
ASVAB Ability Test	42.91	43.51	36.24
Age	28.03	28.03	28.08
Yearly Income in Dollars	19,193	20,340	9,810
Family Income in Dollars	60,022	63,229	37,460
Number of Months Worked	6.55	6.93	4.63
MSA Unemployment Rate	8.63%	8.62%	8.71%
Number of Observations	2,335	2,077	165
<i>Sub-Sample: White Population</i>			
Past Incarceration	5.5%		
Entrepreneurship	12.1%	11.6%	20.5%
Years of Education	13.15	13.25	11.69
ASVAB Ability Test	64.16	65.02	50.51
Age	27.98	27.97	28.20
Yearly Income in Dollars	28,625	29,215	20,771
Family Income in Dollars	106,158	108,921	52,841
Number of Months Worked	7.74	7.83	7.18
MSA Unemployment Rate	8.33%	8.30%	8.69%
Number of Observations	4,665	4,387	215

*Notes: Individuals who are not included in the "Never Incarcerated" and "Formerly Incarcerated" groups are individuals who are currently incarcerated.

Table 4 Unstandardized Coefficients from OLS Regression of Entrepreneurship on Incarceration

	Dependent Variable				
	Entrepreneurship (Self Employment)			Incorporated Self Employment	Self Employment with Employees
	(1)	(2)	(3)	(4)	(5)
Past Incarceration	0.059***	0.056***	0.042***	0.005*	0.023***
	(0.004)	(0.005)	(0.006)	(0.002)	(0.003)
Ln(Years of Education)		-0.017**	0.017**	0.012***	-0.004
		(0.006)	(0.006)	(0.002)	(0.003)
Ln(Yearly Income) (t-1)		-0.010***	-0.009***	-0.000	-0.001***
		(0.001)	(0.001)	(0.000)	(0.000)
Ln(Family Income) (t-1)		0.001	0.002**	0.001**	0.001***
		(0.001)	(0.001)	(0.000)	(0.000)
Number of Months Worked (t-1)		0.005***	0.004***	0.001***	0.001***
		(0.000)	(0.000)	(0.000)	(0.000)
MSA Unemployment Rate		0.003***	0.002***	0.000*	0.001*
		(0.000)	(0.000)	(0.000)	(0.000)
Female		-0.017***			
		(0.001)			
Black		-0.006**			
		(0.002)			
Hispanic		-0.016***			
		(0.002)			
Asian		-0.022***			
		(0.005)			
Mixed Race		-0.010			
		(0.007)			
ASVAB Ability Test		0.000***			
		(0.000)			
Individual Fixed Effects	N	N	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
MSA Fixed Effects	Y	Y	Y	Y	Y
N	167,812	158,827	158,826	158,826	158,826
adj. R-sq	0.055	0.055	0.361	0.136	0.272

* Note: All models exclude observations of individuals who are currently incarcerated at time t. Robust standard errors are used in these models. + p< 0.1 * p< 0.05 ** p<0.01 *** p<0.001

Table 5 Unstandardized Coefficients from OLS Regression of Number of Months in Paid-Employment on Incarceration and Ban-the-Box Policy Implementation

	Dependent Variable		
	Number of Months in Paid-Employment		
	(1)	(2)	(3)
	Full Sample	Sub-sample by Race	
		Black	White
Past Incarceration	-0.523***	-0.838***	-0.488**
	(0.097)	(0.166)	(0.162)
Ban-the-Box	0.055	-0.218*	0.070
	(0.049)	(0.091)	(0.068)
Past Incarceration * Ban-the-Box	0.398*	0.847**	0.030
	(0.201)	(0.317)	(0.332)
Ln(Years of Education)	2.296***	2.014***	2.704***
	(0.112)	(0.230)	(0.154)
Ln(Yearly Income) (t-1)	0.731***	0.606***	0.811***
	(0.012)	(0.022)	(0.017)
Ln(Family Income) (t-1)	0.054***	0.120***	-0.004
	(0.009)	(0.015)	(0.014)
MSA Unemployment Rate	-0.055***	-0.104***	-0.037**
	(0.008)	(0.018)	(0.012)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
MSA Fixed Effects	Y	Y	Y
N	135583	35798	67710
adj. R-sq	0.452	0.479	0.438

* Note: All models exclude observations of individuals who are currently incarcerated at time t. Robust standard errors are used in these models. + p< 0.1 * p< 0.05 ** p<0.01 *** p<0.001

Table 6 Unstandardized Coefficients from OLS Regression of Entrepreneurship on Incarceration and Ban-the-Box Policy Implementation

	Dependent Variable		
	Entrepreneurship (Self-employment)		
	(1)	(2)	(3)
	Full Sample	Sub-sample by Race	
		Black	White
Past Incarceration	0.049***	0.043***	0.052***
	(0.007)	(0.012)	(0.012)
Ban-the-Box	0.004	0.017**	0.003
	(0.004)	(0.007)	(0.005)
Past Incarceration * Ban-the-Box	0.017	-0.048*	0.023
	(0.016)	(0.024)	(0.028)
Ln(Years of Education)	0.001	0.013	-0.008
	(0.007)	(0.014)	(0.010)
Ln(Yearly Income) (t-1)	-0.010***	-0.006***	-0.011***
	(0.001)	(0.001)	(0.001)
Ln(Family Income) (t-1)	0.002***	-0.000	0.004***
	(0.001)	(0.001)	(0.001)
Number of Months Worked (t-1)	0.004***	0.005***	0.004***
	(0.000)	(0.000)	(0.000)
MSA Unemployment Rate	0.000	0.004**	-0.000
	(0.001)	(0.001)	(0.001)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
MSA Fixed Effects	Y	Y	Y
N	135583	35798	67710
adj. R-sq	0.355	0.374	0.360

* Note: All models exclude observations of individuals who are currently incarcerated at time t. Robust standard errors are used in these models. + p< 0.1 * p< 0.05 ** p<0.01 *** p<0.001

Table 7 Unstandardized Coefficients from OLS Regression of Yearly Income on Incarceration and Entrepreneurship

	Dependent Variable		
	Yearly Income in Dollars		
	(1)	(2)	(3)
	Full Sample	Sub-sample by Race	
		Black	White
Past Incarceration	-7016.739***	-6767.689***	-6512.958***
	(274.224)	(383.735)	(468.748)
Entrepreneurship	-890.962***	-929.227**	-1127.093***
	(198.709)	(353.921)	(284.607)
Past Incarceration * Entrepreneurship	3582.647***	1849.050+	3688.572**
	(869.949)	(1009.618)	(1328.286)
Ln(Years of Education)	33878.350***	29568.929***	33901.349***
	(518.398)	(984.791)	(722.403)
Number of Months Worked	705.144***	578.955***	803.352***
	(10.874)	(17.640)	(17.094)
MSA Unemployment Rate	-96.118**	-249.590***	-54.865
	(29.285)	(55.586)	(48.551)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
MSA Fixed Effects	Y	Y	Y
N	147778	38745	75876
adj. R-sq	0.618	0.602	0.630

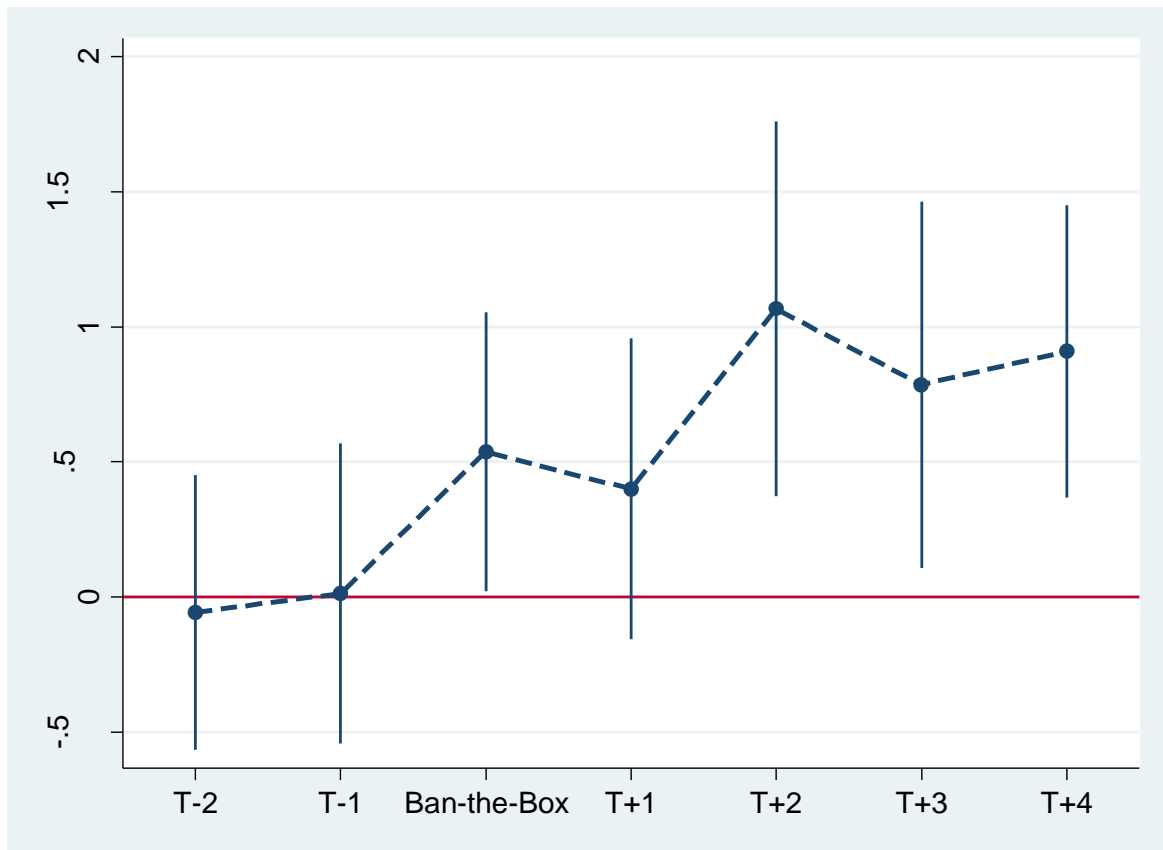
* Note: All models exclude observations of individuals who are currently incarcerated at time t. Robust standard errors are used in these models. + p< 0.1 * p< 0.05 ** p<0.01 *** p<0.001

Table 8 Unstandardized Coefficients from OLS Regression of Recidivism on Entrepreneurship

	Dependent Variable			
	Recidivism (Re-incarceration)			Re-arrest
	(1) Full Sample	(2) Sub-sample by Race Black	(3) White	(4) Full Sample
Entrepreneurship	-0.053*** (0.012)	-0.061* (0.024)	0.003 (0.016)	-0.064*** (0.016)
Years Since Release from Incarceration	-0.038*** (0.002)	-0.047*** (0.003)	-0.035*** (0.002)	0.005* (0.002)
Number of Years Incarcerated	0.046*** (0.005)	0.014* (0.007)	0.075*** (0.009)	0.033*** (0.005)
Ln(Yearly Income) (t-1)	0.001 (0.004)	0.011 (0.007)	-0.005 (0.006)	-0.011* (0.005)
Ln(Years of Education)	-0.028 (0.043)	0.121 (0.088)	0.052 (0.059)	-0.055 (0.055)
Number of Months Worked (t-1)	-0.002+ (0.001)	-0.000 (0.002)	-0.004* (0.002)	-0.002+ (0.001)
Ln(Family Income) (t-1)	0.007* (0.003)	0.003 (0.004)	0.002 (0.005)	0.001 (0.003)
MSA Unemployment Rate	0.006+ (0.003)	-0.004 (0.006)	0.012** (0.005)	-0.001 (0.004)
Individual Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
MSA Fixed Effects	Y	Y	Y	Y
N	7243	2436	3114	7243
adj. R-sq	0.326	0.392	0.457	0.217

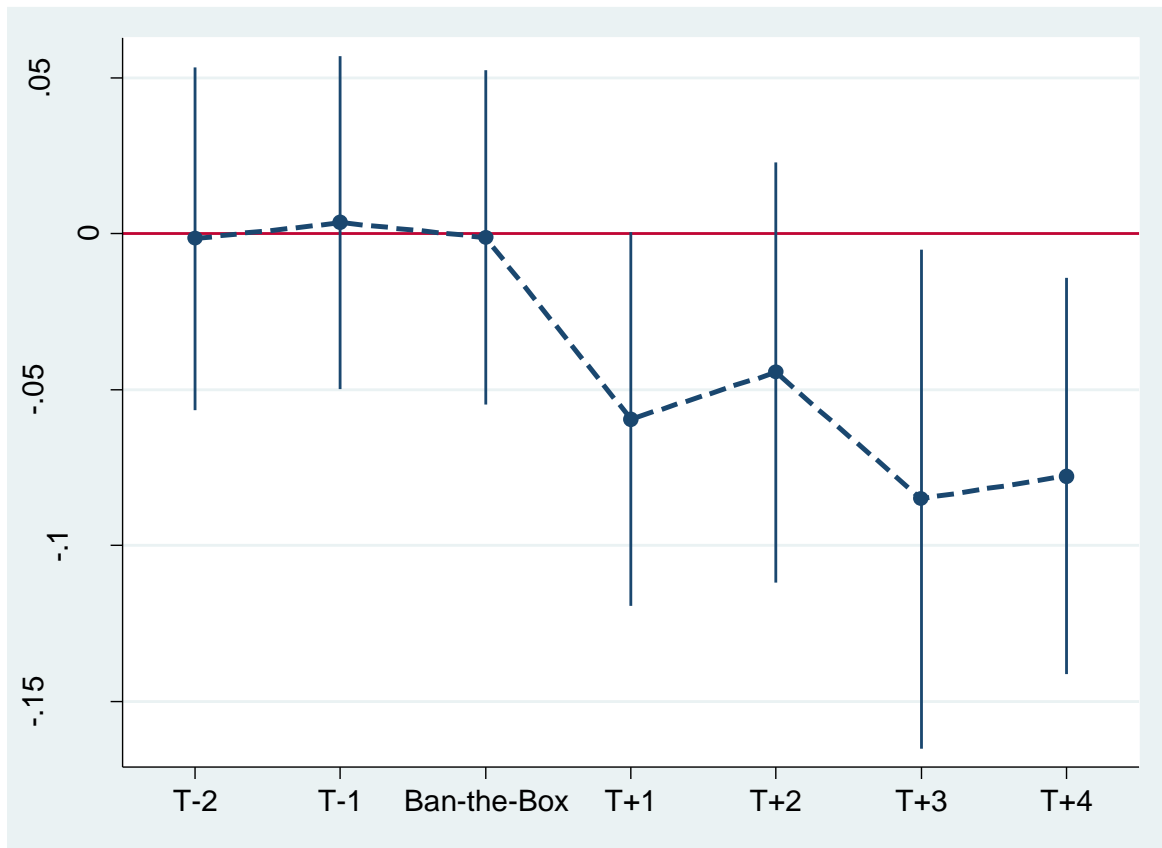
* Note: This sample includes only formerly incarcerated individuals. All models exclude observations of individuals who are currently incarcerated or unemployed at time t. Robust standard errors are used in these models. + p< 0.1 * p< 0.05 ** p<0.01 *** p<0.001

Figure 1 Employment Trend of Formerly Incarcerated Individuals Before and After “Ban-the-Box” Policy Implementation



* The dashed line shows the relative number of months employed for formerly incarcerated individuals in states and counties where Ban-the-Box was implemented in year T0, compared to the baseline (solid horizontal line normalized to zero) which represents the employment of formerly incarcerated individuals in states and counties where Ban-the-Box was not implemented. The figure shows the employment trend of formerly incarcerated individuals in Ban-the-Box states and counties relative to formerly incarcerated individuals in non Ban-the-Box states and counties.

Figure 2 Entrepreneurship Trend of Formerly Incarcerated Individuals Before and After “Ban-the-Box” Policy Implementation



* The dashed line shows the relative probability of entrepreneurship for formerly incarcerated individuals in states and counties where Ban-the-Box was implemented in year T0, compared to the baseline (solid horizontal line normalized to zero) which represents the probability of entrepreneurship of formerly incarcerated individuals in states and counties where Ban-the-Box was not implemented. The figure shows the entrepreneurship trend of formerly incarcerated individuals in Ban-the-Box states and counties relative to formerly incarcerated individuals in non Ban-the-Box states and counties.

Appendix A Unstandardized Coefficients from Matched Sample OLS Regression of Entrepreneurship on Incarceration

	Dependent Variable		
	Entrepreneurship (Self Employment)		
	(1)	(2)	(3)
	PSM Matching	CEM Matching	Individuals with Arrest Records
Past Incarceration	0.035*** (0.007)	0.038*** (0.006)	0.031*** (0.006)
Ln(Years of Education)	0.048* (0.023)	0.034*** (0.009)	0.022+ (0.014)
Ln(Yearly Income) (t-1)	-0.002 (0.002)	-0.009*** (0.001)	-0.008*** (0.001)
Ln(Family Income) (t-1)	0.002 (0.001)	0.001 (0.001)	0.002* (0.001)
Number of Months Worked (t-1)	0.005*** (0.001)	0.004*** (0.000)	0.005*** (0.000)
MSA Unemployment Rate	0.003** (0.001)	0.003*** (0.001)	0.002** (0.001)
Individual Fixed Effects	Y	Y	Y
Year Fixed Effects	Y	Y	Y
MSA Fixed Effects	Y	Y	Y
N	25108	109528	52955
adj. R-sq	0.407	0.363	0.363

* Note: All models exclude observations of individuals who are currently incarcerated at time t. Robust standard errors are used in these models. + p< 0.1 * p< 0.05 ** p<0.01 *** p<0.001