

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

Kylie Jiwon Hwang
Northwestern University

Damon J. Phillips
University of Pennsylvania

This article examines entrepreneurship as a response to 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 US National Longitudinal Survey of Youth 1997 data, we find that formerly incarcerated people are more likely to become entrepreneurs compared to individuals who have never been incarcerated. We take advantage of a quasi-experimental setting by using the staggered implementation of “ban-the-box” policies in the US to disentangle the underlying mechanism of how labor market discrimination affects formerly incarcerated individuals in their decisions to enter entrepreneurship. The findings suggest that formerly incarcerated Black individuals pursue entrepreneurship due to the discrimination they face from employers. We also find that entrepreneurship is a viable alternative career choice for formerly incarcerated individuals, 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.

INTRODUCTION

With over 2.11 million people incarcerated as of 2018, the United States has the highest incarceration rate in the world (Maruschak and Minton 2020).

¹ This research is generously supported by the Ewing Marion Kauffman Foundation, the Wheeler Institute for Business and Development, and the Columbia Business School. The

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This has led to more than 600,000 people per year reentering society from incarceration (Carson 2020). Successful reentry is the exception, however, with over two-thirds of formerly incarcerated people rearrested within three years of reentry (Alper, Durose, Markman 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% compared to 6% for the general public (Wagner and Sawyer 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 (Western 2002; Sugie 2018; Harding, Morenoff, and Wyse 2019). The evidence from research, combined with first-person accounts, has given rise to a stylized fact that is captured by an unemployment-recidivism narrative: formerly incarcerated individuals face labor market 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 United States will continue to be faced with poor reentry outcomes.

In this article, we offer a modification to this narrative by drawing attention to formerly incarcerated people who become (self-employed) entrepreneurs, defined as those who launch their own independent businesses rather than working for an employer. Here, entrepreneurship is examined as a response to labor market discrimination (Lippmann, Davis, and Aldrich 2005; Sørensen and Sharkey 2014; Yang and Kacperczyk 2018).² Entrepreneurship allows formerly incarcerated individuals not only to overcome labor market

authors are grateful for comments and suggestions from Howard Aldrich, Olenka Kacperczyk, Bruce Kogut, Dan Wang, Bruce Western, the AJS reviewers, and seminar participants at Columbia Business School, Cornell University, Massachusetts Institute of Technology, University of Maryland College Park, University of Michigan, Wharton UPenn, Yale School of Management, Academy of Management Annual Meeting and Strategy Doctoral Consortium, the American Sociological Association Annual Conference, the CCC Doctoral Conference, the East Coast Doctoral Conference, the Rising Scholars Conference, the Strategic Management Society Annual Conference, the Transatlantic Doctoral Conference, and the Wharton People and Organizations Conference. We dedicate this article to the life and work of Devah Pager. The contents of this publication are solely the responsibility of the authors. Direct correspondence to Kylie Jiwon Hwang, Kellogg School of Management, Northwestern University, 2211 Campus Drive, Evanston, Illinois 60208. Email: kylie.hwang@kellogg.northwestern.edu

² Following prior sociology studies on entrepreneurship, we focus on entrepreneurship as a labor market status or activity distinct from paid or dependent employment (Sørensen and Fassiottto 2011; Yang and Aldrich 2014). We primarily operationalize entrepreneurship as self-employment (Greenfield et al. 1979; Aldrich 1990) but also examine whether results are similar for the subset of entrepreneurs with employees and entrepreneurs with incorporated businesses.

discrimination by earning an income through starting a new business, but in doing so also to increase the overall chances of successful reentry. Through this examination, we seek to complement efforts to reduce labor market discrimination with an evaluation of entrepreneurship as an alternative path to finding work and income. This alternative may not be the first option for someone returning from prison, but when labor market opportunities are suppressed, the relative attractiveness of entrepreneurship increases. In this way, we also contribute to the important yet challenging question of how stigmatized individuals can overcome persistent labor market discrimination without depending solely on employers' shifting priorities and public policy changes (e.g., Bates and Bates 1997; Waldinger, Aldrich, Ward 1990; Thébaud 2015). Thus, while we maintain the existing narrative of unemployment and recidivism for formerly incarcerated individuals, this article broadens the focus on employment to include entrepreneurship.

We base our theory on classic approaches to entrepreneurship that say social and structural contexts shape entrepreneurial activity independent of individual characteristics (Stinchcombe 1965; Aldrich 1999; Dobrev and Barnett 2005). In particular, we draw from research that highlights incentives to pursue entrepreneurship that are embedded in structural opportunities available in the conventional labor market (Burton, Sørensen, and Beckman 2002; Kacperczyk 2012; Sørensen and Sharkey 2014). Key to our thesis is scholarship focusing on entrepreneurship as a valid alternative to discrimination in the labor market that provides a source of upward economic and social mobility for discriminated individuals (Waldinger et al. 1985; Keister 2000; Lippmann et al. 2005). While prior work has examined entrepreneurial patterns of population groups that face structural discrimination in the conventional market, such as women (Thébaud 2015), immigrants (Waldinger et al. 1985; Light 1972), and racial minorities (Walstad and Kourilsky 1998), we apply this theoretical lens to formerly incarcerated individuals and their entrepreneurial decisions. This article, to our knowledge, is the first to directly examine entrepreneurship as a response to labor market discrimination for formerly incarcerated people.

Specifically, we investigate whether formerly incarcerated individuals are more likely to become entrepreneurs compared to those who have never been incarcerated. As formerly incarcerated individuals face few opportunities in paid employment due to discrimination from employers (Pager 2003; Pager, Western, and Bonikowski, 2009), they may choose to pursue their own businesses (Lippmann et al. 2005; Sørensen and Sharkey 2014). Thus, compared to similar individuals who have never been incarcerated, formerly incarcerated individuals may be more likely to enter entrepreneurship as a route to secure work and income. Importantly, we unpack an underlying causal mechanism of why formerly incarcerated individuals become entrepreneurs. The decision to become an entrepreneur is driven not only by opportunity

structures in the labor market but also individual traits and tastes correlated with incarceration, such as risk preference, education, and poverty. We address these diverse underlying mechanisms by taking advantage of the implementation of “ban-the-box” policies, which exogenously improve labor market opportunities for formerly incarcerated individuals. Ban-the-box policies aim to increase employment opportunities for individuals with criminal records by banning employers from conducting criminal background checks until later in the hiring process (Avery and Hernandez 2018). By comparing entrepreneurial engagement of formerly incarcerated individuals based on the implementation of the ban-the-box policy in their jurisdiction, we find evidence that the lack of traditional employment opportunities drives entrepreneurship for formerly incarcerated individuals.

Using data drawn from the US National Longitudinal Survey of Youth (NLSY97) and hand-collected data from the National Employment Law Project on the implementation of ban-the-box policies in the United States, 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 incarcerated varies by whether they are residing in jurisdictions where ban-the-box policies were implemented. Formerly incarcerated individuals are less likely to enter entrepreneurship when ban-the-box policies are implemented in their jurisdictions of residence, suggesting that a key reason that formerly incarcerated individuals pursue entrepreneurship is to overcome the lack of employment opportunities. We find that this effect holds only for formerly incarcerated Black individuals, who experience the greatest labor market discrimination before the implementation of ban-the-box. These findings help us gain insight into how the change in the severity of labor market discrimination affects entrepreneurship rates.

We further investigate whether entrepreneurship can be a viable response to labor market discrimination for formerly incarcerated individuals by comparing the income and recidivism rates in entrepreneurship, to the baselines of paid employment and unemployment. The negative relationship between incarceration and income is commonly attributed to the stigma of incarceration, as employers undervalue formerly incarcerated individuals as employees and impose income penalties (Western 2002; Holzer, Raphael, and Stoll 2003) and preclude them from higher income jobs (Sugie 2018). We argue that entrepreneurship mitigates the income inequality that formerly incarcerated individuals experience in paid employment, as entrepreneurship provides greater opportunities to earn based on one’s own productivity rather than depending on an employer’s valuation (Lippmann et al. 2005; Hegde and Tumlinson 2021). While formerly incarcerated individuals may also face stigmatization in entrepreneurship, we argue that this barrier is not as overwhelming as the stigma of an incarceration record in

employment. We find supportive evidence that entrepreneurship provides formerly incarcerated individuals with higher yearly and hourly earnings compared to paid employment, helping formerly incarcerated individuals reduce the income gap.

Concerning recidivism, we argue that entrepreneurship yields greater economic and social incentives, such as responsibility, work satisfaction, and the sense of publicly “making good” (Maruna 2008; Lange 2012), that lower formerly incarcerated individuals’ likelihood of reincarceration. We find evidence that formerly incarcerated individuals who engage in entrepreneurship have a lower likelihood of reincarceration compared to those in unemployment or paid employment, supporting the view of entrepreneurship as a way for formerly incarcerated individuals to reenter the society successfully. These findings on income and recidivism suggest that entrepreneurship not only helps formerly incarcerated individuals improve their economic well-being but also social integration.

Our article provides implications for theory, empirical work, and policy. We offer a modification to the current narrative on unemployment and recidivism by introducing entrepreneurship as an alternative pathway to successful reentry for the formerly incarcerated population. By finding that entrepreneurship provides an opportunity for formerly incarcerated individuals to find work, decrease economic inequality, and reduce recidivism rates, we underline our foundational argument of entrepreneurship as a response to the limitations of the labor market for marginalized groups. We further contribute to empirical work by using a quasi-experimental design to infer causality and provide stronger evidence for the underlying mechanism between incarceration and entrepreneurship. Last, we offer policy implications by highlighting entrepreneurship as a route for formerly incarcerated individuals to overcome labor market discrimination without depending solely on 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 a reduction in economic opportunities (e.g., Pager 2003; Pettit and Western 2004). 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% (Freeman 1991; Western and Beckett 1999; Pettit 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; Sugie 2018). 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 et al. (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 (Nagin and Waldfogel 1995; Bushway 1998; Western 2002).

Many studies on labor market outcomes have also observed racial disparities in the negative impact of incarceration on employment outcomes. Racial minorities, especially Black Americans, are not only more likely to be incarcerated but also face greater labor market penalties for incarceration (e.g., Pager 2003; Pager, Western, and Sugie 2009). Pager (2003) shows that the adverse effect of a criminal record is 40% larger for Black job candidates seeking employment than for similar White job candidates. Lyons and Petit (2011) document greater wage penalties for formerly incarcerated Black individuals—10% lower earnings and 21% slower wage growth—compared to similar formerly incarcerated White individuals.

One of the main reasons for negative employment outcomes for formerly incarcerated people is discrimination based on the stigma associated with incarceration (Pager 2003). Employers often consider a criminal record 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 an incarceration record (Holzer et al. 2003). This stigma of incarceration is intensified with Black job applicants, where employers are more likely to discriminate when race and incarceration are compounded (Uggen et al. 2014). A series of 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 by 60% for Black applicants with a record (Pager 2003, 2007). While there are additional individual level mechanisms through which incarceration may negatively affect subsequent employment, such as the erosion of human and social capital (Hagan 1993; Kling 1999), the institutional effect of stigmatization by employers remains the main driver of adverse employment opportunities (Sugie, Zatz, and Augustine 2020).

Researchers have underlined the significance of employment barriers associated with incarceration because employment is one of the strongest predictors of successful reentry. Studies largely show that unemployment or job instability following release from prison increases the chances of reoffending (e.g., Farrington et al. 1986). Employment not only provides formerly incarcerated individuals with resources that reduce the material motivations for crime and increases the costs of recidivism, but also is a key foundation for social reintegration (Sampson and Laub 1997; Harding et al. 2019). Yet,

meta-analyses of transitional employment programs find modest or null results on whether employment leads to a decrease in crime (Drake, Aos, and Miller 2009; Bushway and Apel 2012). The pattern lends support to the importance of the characteristics or quality of “work” and its implications for recidivism (Orr et al. 1996). As suggested by Maruna (2008, chap. 6): “‘Work’ covers a broad range of activities, spanning from stigmatized “dirty work” (Shover 1996) to leadership careers in the managerial class. . . . Work can be found punishing and work can be found rewarding. If it is found rewarding, then it seems likely to help support desistance.” Thus, it is not “employment per se” or “employment by itself” (Laub and Sampson 1993, p. 304), but meaningful and rewarding employment, that provides formerly incarcerated individuals grounds for successful reentry.

Economic aspects of work quality have been emphasized by some scholars, where only “high quality” jobs with “adequate hours and pay” (Allan and Steffensmeier 1989, p. 107) reduce recidivism. Others argue nonpecuniary aspects of work to be as important as monetary outcomes for crime reduction, emphasizing prestige, personal achievement, and social ascent associated with work (Merton 1938). Sampson and Laub argue that work stability and commitment to work, strengthened by high quality employment, provide a positive turning point in the life course and reduce criminal behavior (see Sampson and Laub 1990; Laub and Sampson 1993). Uggen (1999) finds that work or job satisfaction reduces the likelihood of reoffending both economic and noneconomic crimes, even controlling for wages.

Unfortunately, most formerly incarcerated individuals cannot find rewarding quality work. Due to barriers to employment, formerly incarcerated people experience unemployment or resort to working in low quality jobs or “dirty work” (Sugie 2018; Harding et al. 2019). The stylized fact capturing the relationship between poor employment outcomes and adverse reentry consequences 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 accompanying evidence have 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 somewhat reduced employment barriers for individuals with criminal records and formerly incarcerated individuals, in particular.

Incarceration and Entrepreneurship

Despite this focus on improving employment prospects, labor market discrimination persists for formerly incarcerated individuals. Meanwhile, there

is increasing anecdotal evidence of formerly incarcerated individuals carving out their own careers by becoming entrepreneurs (Remnick 2016; Fox 2021). Yet research on understanding entrepreneurship as a reentry route for formerly incarcerated individuals has been sparse.

We offer a modification to the unemployment-recidivism narrative by considering entrepreneurship as an alternative labor market choice to unemployment and under-employment for formerly incarcerated individuals in the face of discrimination. Following sociological research on entrepreneurship, we conceptualize entrepreneurship as the establishment or ownership of one's own business, and we label the people who create businesses and manage them as *entrepreneurs* (Lippmann et al. 2005; Aldrich and Waldinger 1990). Within this perspective, entrepreneurship includes self-employment, where one's status as an entrepreneur is independent of whether he or she employs others (Lippmann et al. 2005; Reynolds and Curtin 2008). Thus, we focus on entrepreneurship as a labor market status distinct from paid or dependent employment, as Burton, Sørensen, and Dobrev (2016, p. 243) note, "the most elemental act of entrepreneurship is an individual's decision to forgo paid-employment and assume the responsibility and risk of operating a new venture." Based on this main conceptualization, we operationalize entrepreneurship as self-employment, but also consider narrower definitions of entrepreneurship that restrict entrepreneurship to businesses that were founded as incorporated or were employing others at the time of founding.³

In our modification, we argue that formerly incarcerated individuals may choose to launch their own businesses in response to barriers to employment. We suggest that entrepreneurship can provide formerly incarcerated individuals with not only economic opportunities but help their successful reentry into society. Thus, while gainful employment remains an important and primary 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 or of poor quality.

We address four key questions to establish this modified narrative for the formerly incarcerated. First, to what extent do formerly incarcerated people engage in entrepreneurship compared to people who have never been incarcerated? Second, what is the underlying mechanism by which people who have previously been incarcerated choose to become entrepreneurs? Third, if we examine earnings, can we assess the degree to which entrepreneurship helps formerly incarcerated individuals mitigate economic inequality compared to their peers in paid employment? Last, when we compare recidivism

³ While there are more restrictive definitions of entrepreneurship that emphasize innovativeness, creative destruction, value creation, and risk-taking capacity (Shane 2003), this is not the focus of our theorizing as it does not necessarily imply starting a new business. Also, only considering new business which seek innovativeness or novelty (e.g., venture-backed startups) overly restricts the sample without adding theoretical value to our topic.

rates between formerly incarcerated entrepreneurs and their peers in paid employment and unemployment, do we see greater success in reentry on the part of the former? By examining these four questions, we validate entrepreneurship as a response to discrimination in the labor market, providing better economic and social outcomes in comparison to both unemployment and paid employment.

Incarceration and Entrepreneurial Entry

Our first question investigates the extent to which formerly incarcerated individuals take part in entrepreneurship, compared to individuals who have never been incarcerated. Classic sociological approaches to entrepreneurship have emphasized the role of structural and situational factors in shaping the decision to engage in entrepreneurship. Stinchcombe (1965, p. 147) argues in his canonical essay that “the probability that a man or a group of men will be motivated to start an organization is dependent on the social structure and on the position of men within it.” Furthermore, sociologists have argued that the dynamics of new business formation depend critically on the social structure of opportunities and resources (Light 1972; Hannan and Freeman 1977; Zimmer and Aldrich 1987). This view emphasizes the structure of choices and opportunities, particularly the opportunity structure of the labor market, as drivers of entrepreneurship independent of individual differences in tastes and traits (Aldrich 1999; Burton et al. 2002). Individuals pursue entrepreneurship after considering the distinct opportunities in the labor market, where entrepreneurial entry is more appealing to individuals with fewer and less rewarding employment opportunities (Yang and Kacperczyk 2018).

As the labor market opportunity structure has a profound influence on an individual’s transition to entrepreneurship, scholars have suggested that discrimination or inequality in the conventional labor market increases the likelihood of disadvantaged individuals becoming entrepreneurs (Bonacich 1973; Light 1979; Keister 2000). Light (1979, p. 35) elaborates that minorities disadvantaged due to labor market discrimination face a dire choice between unemployment and low wages, placing “an enormous incentive upon locating independent means of livelihood.” Lippmann et al. (2005, p. 10) argue that individuals undertake entrepreneurship “when there are few, if any, other options for finding suitable work” in the labor market. Considered this way, individuals who face blocked opportunities in the employment market pursue entrepreneurship in an effort to secure work and income.

While negative stereotypes and unequal access to resources can cast barriers to entrepreneurial activity for discriminated groups (Blanchflower, Levine, and Zimmerman 2003; Fairlie and Robb 2007), entrepreneurship can also disrupt patterns of inequality and be a source of upward mobility for individuals (Stinchcombe 1965; Lippman et al. 2005). Particularly in the

United States, entrepreneurship has been a significant source of upward mobility for marginalized groups who are more likely to be excluded from opportunities for mobility in conventional labor markets (Dobrev and Barnett 2005). For example, Glazer and Moynihan (1963, p. 36) argue that “[starting a] business is in America the most effective form of social mobility for those who meet prejudice,” consistent with the claim that entrepreneurship can be an alternative route to avoid stigma from employers and to gain greater opportunity to work and earn according to one’s own ability. Scholars have identified key population groups that, due to discrimination from employers, engage in entrepreneurship as a source of economic and social mobility, such as women (Thébaud 2015; Yang and Kacperczyk 2018), individuals with disabilities (Harris et al. 2014), immigrants (Light 1972, Wal-dinger et al. 1985; Borjas 1987), LGBTQ persons (Conti, Kacperczyk, and Valentini 2021), and racial minorities (Fairlie 1999; Fairlie and Robb 2007). While some researchers have documented challenges in procuring financial resources for discriminated groups (Chatterji and Seamans 2012; Thébaud and Sharkey 2015), most studies have found such entrepreneurial barriers to affect the type or long-term success of the business rather than preclude minority or discriminated groups from entering entrepreneurship altogether (Stinchcombe 1965; Lippmann et al. 2005; Kim, Aldrich, and Keister 2006).⁴

In this vein, formerly incarcerated individuals who face a structure of discrimination and inequality in the conventional labor market are more likely to turn to entrepreneurship. While formerly incarcerated individuals may also face challenges in entrepreneurship as well as the risk and uncertainty of failure, severe labor market discrimination can mean expected returns from pursuing entrepreneurship are greater than expected returns from employment. Unemployment or underemployment (in terms of low wages, poor working conditions, blocked promotion opportunities, etc.) due to labor market discrimination lowers the opportunity costs of forgoing employment and makes entrepreneurship a more attractive option. Furthermore, due to the substantial barriers in securing employment, entrepreneurship may be the only available option or a last resort to find work and income for the formerly incarcerated. This implies that compared to similar never-incarcerated individuals, formerly incarcerated individuals are more likely to become entrepreneurs. Accordingly, we formally test the extent to which formerly incarcerated

⁴ Some researchers have asserted that financial capital is critical for entrepreneurship and that liquidity constraints inhibit start-ups (Evans and Jovanovic 1989). Yet, entrepreneurship does not necessarily require large amounts of financial capital, as 57.2% of all business owners in the United States started their businesses with less than \$5,000 of start-up capital (Fairlie 2012). Sociologists have argued that economists and other scholars have placed too much significance on the availability of monetary assets in starting a business (Aldrich 1999).

individuals engage in entrepreneurship, compared to never-incarcerated individuals.

Explanatory Mechanism of Incarceration and Entrepreneurship

To explore to our second point, we unpack the underlying mechanism of why formerly incarcerated individuals enter entrepreneurship, compared to similar individuals who have never been incarcerated. This focus allows us to parse out the structural effect of labor market discrimination from the individual dispositional 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 the structural context of labor market discrimination. At the same time, individual-level mechanisms such as preferences or dispositions may also make entrepreneurship more appealing than employment for formerly incarcerated individuals. Some scholars have found suggestive evidence that individuals who take part in criminal activity are similar to entrepreneurs, in terms of low risk aversion and a preference for autonomy (e.g., Rieple 1998; Lockwood et al. 2006; Gottschalk 2009). 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 skills (Sonfield, Lussier, and Barbato 2001; Fairlie 2002).

While both the structural mechanism of 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. Specifically, we utilize 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 an exogenous decrease in labor market discrimination for formerly incarcerated individuals will subsequently diminish their likelihood to engage in entrepreneurship.

In particular, we expect the exogenous mitigation of employer discrimination to have the greatest negative impact on entrepreneurial transitions for formerly incarcerated individuals who face the most labor market discrimination—formerly incarcerated Black individuals. Black individuals have been documented to face more severe discrimination from employers based on the stigma of an incarceration or criminal record, compared to White individuals (Pager 2003; Pager and Quillian 2005). Thus, we argue that labor market discrimination will have a greater influence on the entrepreneurial entry of formerly incarcerated Black individuals such that a decrease in labor

market discrimination will improve employment opportunities for formerly incarcerated Black individuals (compared to their White peers), leading to a greater decrease in their likelihood of entrepreneurial engagement. By using the exogenous change of labor market discrimination and its racialized impacts, this study effectively isolates and verifies the effect of labor market discrimination on entrepreneurial transitions of formerly incarcerated people, net of any individual-level determinants.

Entrepreneurship and Income

To address our third point, we investigate whether entrepreneurship mitigates economic inequality for formerly incarcerated individuals by examining their entrepreneurial earnings compared to that of paid employment. Formerly incarcerated individuals experience considerable income penalties compared to similar never-incarcerated individuals even when they do succeed in securing employment because employers discriminate based on their incarceration record (Western 2002). The stigma of incarceration makes employers connect formerly incarcerated employees with a range of undesirable characteristics such as dangerousness (Denver, Pickett, and Bushway 2017), untrustworthiness (Holzer, Raphael, and Stoll 2006; Lageson, Vuolo, and Uggen 2015), and lack of honesty (Lott 1992), which leads to decreased wages and wage mobility (Western 2002; Harding et al. 2019). Furthermore, this stigma increases barriers to favorable or “good” jobs, thus precluding entry into higher-status or higher-paying employment positions (Waldinger and Lichter 2003; Holzer Raphael, and Stoll 2004; Sugie et al. 2020). In other words, independent of formerly incarcerated individuals’ underlying ability as workers, employers are more likely to undervalue them based on the stigma associated with their incarceration record and confer income penalties (Sugie et al. 2020; Pager, Bonikowski, and Western 2009).

We argue that formerly incarcerated individuals can mitigate this income penalty and the economic inequality that is derived from employer’s discrimination by engaging in entrepreneurship. Unlike employees, who receive earnings based on the (biased) employer’s perception or valuation, entrepreneurs have greater opportunities to earn based on their true underlying ability as workers (Lippmann et al. 2005; Hegde and Tumlinson 2021). Thus, for individuals who are undervalued by employers due to discrimination, entrepreneurship provides an opportunity to increase earnings and mitigate the income penalty from employment. This aligns with findings from other marginalized groups who face discrimination and undervaluation from employers. For example, immigrant entrepreneurship is described as an adaptation to employer discrimination, where entrepreneurship represents a significant avenue for economic mobility for immigrants in the face of blocked opportunities (Waldinger 1986; Portes and Zhou 1996). African American

entrepreneurs are more likely to move into higher income groups than are African American non-entrepreneurs (Bradford 2014). Chang (2010) argues that the gender earnings gap narrows as women gain greater opportunities for business creation and growth.

It is worth noting that previous research in entrepreneurship has shown an entrepreneurial income penalty for the general population, where (self-employed) entrepreneurs earn less than their employed counterparts (e.g., Evans and Leighton 1989; Hamilton 2000; Moskowitz and Vissing-Jørgensen 2002). Hamilton (2000) suggests that entrepreneurs would be better off, in terms of earnings, if they remained in paid employment. We argue that such an entrepreneurial penalty compared to employment only holds when earnings from employment itself are not affected by discrimination. For populations that earn unbiased earnings from employment, entrepreneurship entails the risk of failure and higher variance in earnings, resulting in lower average (or median) expected income. However, for populations that are undervalued by employers due to discrimination, entrepreneurship offers an opportunity to earn competitive earnings without having to rely on or be hindered by employers' negative perceptions.

Thus, we expect formerly incarcerated individuals, a group that is undervalued by employers due to discrimination, to earn higher earnings in entrepreneurship compared to paid employment. Although entrepreneurship entails added risk, the elimination of discrimination and stigma from employers will, on average, yield higher earnings from entrepreneurship compared to that from employment for the formerly incarcerated. While entrepreneurship provides a road to economic mobility, the same factors that encourage formerly incarcerated individuals into entrepreneurship may pose barriers to entrepreneurship as well, such as limited access to financial or social capital. Therefore, we expect to find that the income gap between formerly incarcerated individuals and never-incarcerated individuals persists even for entrepreneurs, but this income gap will be less than the gap in paid employment. By reducing the barriers to competitive earnings, entrepreneurship can provide formerly incarcerated individuals the opportunity to mitigate, if not overcome, economic inequality.

Entrepreneurship and Recidivism

The fourth objective of this study is to assess, by examining recidivism rates, how entrepreneurship impacts successful reentry. Merton (1938) posits that when legitimate means to success are blocked, criminal motivation rises. Thus, research has focused on how employment, as a legitimate means to attainment, is one of the strongest predictors of reduction of recidivism (e.g., Sampson and Laub 1993; Uggen 2000). Employment not only provides immediate financial support but also increases future expected earnings, which

in turn significantly increases the opportunity cost of criminal behavior and consequentially reduces the likelihood of reoffending (Pezzin 1995). We argue that entrepreneurship, as an alternative legitimate means to economic opportunities, will also reduce reengagement in criminal activities for formerly incarcerated individuals. In particular, as we predict entrepreneurship to yield even greater economic opportunities than employment for formerly incarcerated individuals, we expect entrepreneurship to provide greater reduction of recidivism not only compared to unemployment but also to paid employment.

Entrepreneurship may also provide formerly incarcerated individuals social and psychological incentives to avoid activities that can lead to rearrest and reincarceration. Studies have found that commitment to work, satisfaction from “rewarding work” (Maruna 2008, chap.6), and personal fulfillment diminishes the likelihood of recidivism beyond the financial aspect of work itself (Uggen 1999). Merton (1968), while emphasizing economic equality and monetary success, also identifies extraeconomic aspects of social position—such as prestige, personal achievement, and social ascent—to be important in reducing crime. Prior work and anecdotal evidence from formerly incarcerated entrepreneurs also suggest that entrepreneurship enhances work satisfaction, self-esteem, and commitment (Fox 2021). For example, Lange (2012) found that self-employed individuals reported greater job satisfaction, stemming from the autonomy associated with self-employment, compared to similar individuals working in paid employment. Relatedly, Uggen (1999) finds that self-employed managers, administrators, and proprietors rank among those with the highest job satisfaction scores, and that working in a job with high quality or satisfaction score significantly decreases the likelihood of recidivism.

In addition, entrepreneurship also entails being responsible for your business and often the livelihood of fellow employees and customers, which increases the sense of responsibility, empowerment, and civic reintegration for formerly incarcerated entrepreneurs. Thus, entrepreneurship can be closely tied to publicly “making good” or giving back to society, which can explain desisting behavior from formerly incarcerated people (Maruna 2008, chap. 5). While it is beyond the scope of this article to fully parse out these mechanisms, we expect formerly incarcerated entrepreneurs to show lower recidivism compared to formerly incarcerated individuals in unemployment or paid employment, which supports the view of entrepreneurship as a way for formerly incarcerated individuals to successfully reenter society.

By investigating the four research questions, this article seeks to present a modification to the existing narrative of unemployment and recidivism. We complement the current narrative’s focus 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 sections, we describe the data and methods, and show our empirical analyses that allow us to address the above research questions.

DATA AND MEASURES

We use data from the 1997 cohort of the NLSY. The NLSY 97 follows 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, producing a 17-period panel until 2015. The NLSY97 Restricted Geocode data provides identifying information about yearly state and county/city-level residence by survey respondent, allowing us to utilize the state and county/city-level policy shocks to address the causal mechanism. As shown by prior research (e.g., Western 2002; Western and Pettit 2010) the NLSY data is suitable for research on incarceration because it reports detailed data on youth detention and adult incarceration. Moreover, the NLSY includes a comprehensive range of variables on entrepreneurship and employment, allowing us to examine entrepreneurial and employment transitions as well as related earnings.

Our final estimation sample includes individual-year observations from 14 survey rounds from 2000 to 2015 of individuals when they are 18 years or older; these data allow us to incorporate the plausibility of entrepreneurship as a career choice for individuals. We exclude individual-year observations during periods when the individual is incarcerated, as they are unable to participate in labor market activities as either an employee or an entrepreneur. Finally, because of attrition and missing data, our sample excludes individual-year observations when respondents permanently attrite from the survey sample, and we impute missing observations for key analysis variables. These restrictions create an estimation sample of an unbalanced panel with 106,737 individual-year observations for 8,762 individuals who have an average of 7.5 years of data. Online supplement table S1A provides a more detailed description of the data and sample construction.

Given the longitudinal nature of the NLSY97 data, we address potential issues around data attrition, data missingness, and quality of responses. We find that NLSY97 has relatively low attrition rates of respondents, where 79% of the respondents eligible for interview remained in the sample by 2015, the last year of survey in our study. We also confirm that the attrition rate is similar across prior incarceration status and race, to ensure that the differences in attrition from the survey do not produce biased results (see supplement table S1B). To address data missingness, we impute missing observations for variables by mean imputation as well as carrying forward the last observed value for respondents that did not permanently drop out of the sample (see supplement table S1C for details on the data generating and

missingness imputation processes for all variables). For a sensitivity check, we obtain similar results when we run our analyses by using different imputation methods for missing variables and by excluding observations with missing observations from our analyses. To address concerns on bias due to nonrandom data missingness, we confirm that data missingness and response quality are similar across prior incarceration status and race (see supplement tables S1C and S1D).

We merged the NLSY97 sample with data on ban-the-box policies for all states and counties/cities 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) and legislative bills and executive orders of states and counties/cities on the implementation of ban-the-box 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 (see supplement table S2). Our analyses consider ban-the-box policies for public employers effective by December 2015, which results in 18 states and 133 counties/cities that implemented ban-the-box policies. We discuss our focus on the public ban-the-box policy and its implications in the methods and discussion section below.

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.”⁵ 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., Portes and Zhou 1996; Yang and Aldrich 2014). To exclude short-term self-employment stints or freelancing that are unlikely to involve business ownership (Sugie et al. 2020), we only include self-employment spells that last more than four weeks. As a result, on average, 10.04% of the survey respondents were self-employed each year and 32.07% of the unique 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 rates in the United States were approximately 10%–11% during this period (Hippel 2010).

While prior research does not sharply confine the concept of entrepreneurship to creating an incorporated organization or employing others (Lippmann et al. 2005), for robustness, we confirm whether our findings are

⁵ NLSY variable codebook on self-employment can be found: <https://www.nlsinfo.org/sites/nlsinfo.org/files/attachments/17036/NLSY97R17Employment.html>

consistent with a narrower definition of entrepreneurship. Our alternative measure of *entrepreneurship* is the subset of self-employed individuals who report (a) owning an incorporated business or (b) having employees. On average 2.52% of the survey respondents started incorporated businesses or business with employees each year and 11.38% of unique survey respondents had experienced such entrepreneurship at least once throughout the survey rounds. Among the unique survey respondents who were broadly defined as entrepreneurs, measured by self-employment, 35.47% were coded as entrepreneurs according to this narrow definition of entrepreneurship (22.04% are incorporated, 25.37% have employees, and 11.94% are both incorporated and have employees; $22.04 + 25.37 - 11.94 = 35.47$). This percentage is greater for the formerly incarcerated individuals, where 41.53% of the self-employed formerly incarcerated entrepreneurs were also incorporated or employers (20.56% are incorporated, 31.05% have employees, and 10.08% are both incorporated and have employees), whereas 34.73% of the self-employed never-incarcerated entrepreneurs were also either incorporated or were employers (21.81% are incorporated, 24.59% have employees, and 11.67% are both incorporated and have employees). We test our results with the narrower definition of entrepreneurship (with incorporation or employees) and find consistent results.

Prior Incarceration is measured by whether the survey respondent served time in a correctional institution. The NLSY97 documents whether the respondent was incarcerated or not in each month of the year, collected yearly from 1992 to 2015, including 2012 and 2014, when annual surveys were not conducted. *Prior Incarceration* is 1 if the respondent responded as previously incarcerated in any months of year $t - 1$ or earlier, and 0 otherwise. *Prior Incarceration* provides the key information needed to estimate the effect of incarceration after release. Among the 8,984 individuals in our sample 795 unique individuals (8.85%) were previously incarcerated as of 2015. This is similar to statistics from other studies and samples, where the percentage of those that have been previously incarcerated range from 8% to 9% (Bonczar and Beck 1997; Western 2002). The accuracy of incarceration as measured in the NLSY has been further assessed by Western (2002), who shows comparable incarceration trends between the NLSY data and aggregate data from the CPS and BJS data. Individuals were excluded from analyses in the years when they were currently incarcerated (2% of the survey respondents each year), which made them unable to participate in employment or entrepreneurship. Current incarceration status can also be controlled for by adding a dummy variable measuring whether respondent was incarcerated in current year t , rather than excluding them from the sample. 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 time frame and the scope of criminal behavior. Some broadly define recidivism by counting any new contact with the criminal justice system, including minor offenses and rearrests for technical violations (Markman et al. 2016; Hunt and Dumville 2016). Yet others argue that recidivism should be more narrowly defined as the commission of a new serious offense, resulting in a new sentence (Baber 2015; Johnson 2017). Our study follows this second school of thought and measures *Recidivism* for individual i at time t as the reincarceration of formerly incarcerated individuals in time t for a new offense after release from their previous sentence.

We find that an average of 10.30% of formerly incarcerated individuals fall into recidivism under this measure each year and 35.81% of unique formerly incarcerated individuals fall into recidivism after release from prison or jail.⁶ To understand the long-term effects of entrepreneurship and paid employment on reincarceration, we also measure *Recidivism* as a more long-term reincarceration measure, where *Recidivism* is coded 1 if the formerly incarcerated individual is reincarcerated for a new offense within the next five years (years t to $t + 4$) after engaging in entrepreneurship or paid employment at time t . This allows us to consider the long-term impact of entrepreneurship and paid employment on individual recidivism rates. In addition, for robustness, we also measure *Recidivism* alternatively as the *Rearrest* of formerly incarcerated individual i at time t as the rearrest of formerly incarcerated individuals in time t for a new offense after release from their previous sentence, which yields 20.42% rearrest rates with 57.38% of unique formerly incarcerated individuals falling into recidivism after prison or jail. All measures are consistent with the average recidivism rate in the United States found in other studies (e.g., Markman et al. 2016), and we find similar results with both measures of *Recidivism* and *Rearrest*.

Earnings is measured as *Logged Annual Earnings* and *Logged Hourly Earnings*. The NLSY97 surveys report income after checking the information against the individuals’ information gathered from employer surveys and

⁶ We run robustness checks, which limits the sample to observations that are within the time frame of three years or five years of release from prison or jail (a more short-termed time frame), to understand the impact of entrepreneurship and employment in the time-frame immediately after release. We find consistent results throughout.

CPS. It is possible that entrepreneurs' annual earnings are higher, not because they are compensated more for their work but because they work more (Hegde and Tumlinson 2021). Therefore, we use an additional measure of logged hourly earnings, which is based on a separate question in the survey that asks the hourly earnings as of either the job's stop date or the interview date for ongoing jobs, and find consistent results. All earnings data are standardized by the consumer price index deflator to obtain earnings in constant 1997 dollars. To protect the confidentiality of respondents, the NLSY "top codes" the top 2% of reported values and replaces them with the mean of the high values. While this addresses some of the outliers, we further follow other work using the NLSY (Western 2002) and discard outliers greater than five times the median income (see Bernhardt et al. 2001). We tested the sensitivity of the outliers by using different outlier cutoffs (three times the standard deviation difference from the mean), winsorizing the income at 99%, and running quantile regressions, which each generate consistent results.

The NLSY 97 categorizes race and ethnicity as *Black*, *Hispanic*, *Asian*, *White*, and *Multiracial respondents*. Our sample contains 25.99% *Black respondents*, 21.16% *Hispanic respondents*, 1.78% *Asian respondents*, 50.19% *White respondents*, and .92% *Multiracial respondents*. We control for each race and ethnicity by adding dummy variables for all race categories except *White respondents*, the omitted category. We also examine subsamples by race, particularly the subsamples of White and Black respondents, as past scholarship on labor market discrimination and incarceration suggests that the main effects between the two races differ (Western 2002; Pager 2003). Indeed, we observe substantially different likelihoods of incarceration by race: 15.12% of *Black respondents*, 10.52% of *Hispanic respondents*, 4.38% of *Asian respondents*, 7.72% of *White respondents*, 13.25% of *Multiracial respondents* were ever incarcerated. To control for gender, we also include the control *Female*. In our sample 48.80% are female. Female respondents and male respondents show different likelihood of incarceration, as 3.85% of the female respondents were ever incarcerated, compared to 16.42% of the male respondents. For most of our analyses, we include individual-level fixed effects that control for race and gender.

We account for individual-level human capital differences that may affect the likelihood of being incarcerated, selection into entrepreneurship and employment, or labor market outcomes. Specifically, we include variables on individual educational attainment and cognitive ability. We measured educational attainment by the natural logarithm of the years of total education completed, *Logged Years of Education*. 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*. The *ASVAB Test* or the composite percentile generated from the 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 Tumlinson 2021). 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.

Scholars have found family earnings and one's own previous earnings to drive decisions to engage in entrepreneurship as a proxy for credit constraints and access to financial resources such as start-up funds that facilitate both the founding and management of a business (Levine and Rubinstein 2017; Renzulli, Aldrich, and Moody 2000). Thus, we control for the previous year's *Logged Annual Earnings* and *Logged Family Annual Earnings*. 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* in the previous year, which includes the number of months worked in both entrepreneurship and employment, as prior work has found the number of months working (or not working) in the previous year to impact one's decision into entrepreneurship (Evans and Leighton 1989). In our income analyses, we control for the *Number of Months Worked* in the current year, to make a fair comparison between entrepreneurs and employees who worked the same number of months. We control for the *Local Unemployment Rate* at the county/city-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 fixed effects and region fixed effects at the county/city level, to account for yearly and local labor market conditions.

For the recidivism analyses, which uses a subset of 4,775 individual-year observations of individuals who have previously been incarcerated, we include additional variables that prior research has found to be important in explaining recidivism. First, as we are interested in comparing the impact of entrepreneurship on recidivism to the baseline of unemployment as well as paid-employment, we include a variable for *Paid Employment* which takes a value of 1 when an individual's main job was in paid employment in a given year t instead of entrepreneurship or unemployment. For robustness, we also coded *Percentage of Number of Months in Entrepreneurship* and *Percentage of Number of Months in Paid Employment* to obtain finer-grained measures of how long respondents were working in entrepreneurship versus paid employment at year t . These variables are operationalized as the number of months in entrepreneurship or paid employment divided by the total number of months in the labor force to account for the possibility that the length of work in year t will be systematically shorter for those who fall back into recidivism. The results from binary

and fine-grained measures of entrepreneurship and paid employment are almost identical.

For the recidivism analyses, we also include four incarceration related controls (1) *Logged Number of Years since Release from Prison*, (2) *Logged Number of Years Spent Incarcerated*, (3) *Logged Number of Times Arrested*, and (4) *Type of Crime*. Prior research has shown that recidivism decreases with the amount of time passed since release from prison and increases with the length of incarceration and the number of times arrested (Petersilia 2002). We control for the type of crime that the focal individual was involved in during their most recent incarceration by including a control for violent crime (assault and robbery), property crime (burglary, theft, destruction of property, other property crimes including possessing stolen property), drug crime (selling or possessing illegal drugs), and other crimes (such as public order offense, major traffic offense, violation of parole, or probation), which are not mutually exclusive. Prior research has suggested the importance of examining differences in recidivism rates by crime type but has found mixed findings as to which type of crime leads to more recidivism (Petersilia 2002; Rosenfeld, Wallman, Fornango 2005). We control for whether the focal individual has any biological children born and residing in the household at year t , given the importance of how being responsible for a child decreases recidivism (Shover 1996; Burnett 2004). Last, for the recidivism analyses we follow prior work on recidivism and control for individual traits rather than include individual fixed effects (Wadsworth 2006).

Table 1 shows the descriptive statistics of the main variables in our sample. The first section of table 1 provides the statistics for the full individual-year sample with 106,737 observations, while the second section of table 1 provides the statistics for variables that apply to the individual-year subsample of only formerly incarcerated individuals used in the recidivism analyses with 4,775 observations. Table 2 provides illustrative statistics on the likelihood of entrepreneurship by prior incarceration status and race for one representative year, 2010, which is the first year all survey respondents are 25 years old or older. Entrepreneurship rates among formerly incarcerated individuals are higher than those of never-incarcerated individuals, for both types of entrepreneurship, measured as self-employment (t -statistics of -4.618 , $P < 0.001$) and more narrowly as self-employment with incorporation or employees (t -statistics of -3.872 , $P < 0.001$). We find the same pattern for both the Black and White populations.

METHODS

To study incarceration and entrepreneurship, we conduct a series of linear regression analyses. First, we estimate the probability that an individual engages in entrepreneurship as a function of prior incarceration, race, and other

Labor Market Discrimination

TABLE 1
DESCRIPTIVE STATISTICS OF MAIN VARIABLES USED IN REGRESSION ANALYSES, 2000–2015

	Mean	SD	Min	Max
Full sample (individual-years, $N = 106,737$):				
Entrepreneurship (self-employment)	.100	.301	0	1
Entrepreneurship (self-employment w/incorporation or employees)	.025	.157	0	1
Past incarceration	.043	.204	0	1
ln(Years of education)	2.502	.151	2.303	3.045
ln(Annual earnings in 97 dollars)	8.554	2.269	0	11.152
ln(Hourly earnings in 97 dollars)	6.662	.719	0	7.677
ln(Family earnings in 97 dollars)	10.181	2.103	0	13.754
No. of months worked	8.453	4.500	0	12
ASVAB ability test	55.210	25.925	0	100
Local unemployment rate	6.385	2.582	1.4	27.8
Subsample of formerly incarcerated individuals (individual-years, $N = 4,775$):				
Recidivism (reincarceration) 1 year	.103	.304	0	1
Recidivism (reincarceration) 5 year	.308	.462	0	1
Paid employment	.615	.487	0	1
ln(Years since release from incarceration)	1.125	.803	0	2.833
ln(No. of years incarcerated)	.538	.528	0	2.526
ln(No. of times arrested)	1.245	.469	0	2.485
Violent crime	.306	.461	0	1
Drug crime	.348	.476	0	1
Property crime	.368	.482	0	1
Other crime	.777	.416	0	1
Has child	.321	.467	0	1

control variables—such as cognitive ability, education, and prior income—through the main model:

$$Entrepreneurship_{it} = \alpha + \beta_1 Past\ Incarceration_{it} + \beta_2 X_{it} + c_t + c_{region} + \epsilon_{it},$$

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. We also include year fixed effects (c_t) and region fixed effects (c_{region}) at the city/county-level to control for differences between time and regions. For this model, incarceration produces a shift in the probability of entrepreneurial engagement by $\beta_1\%$.

While we will show support for our arguments using this initial model specification, these results are difficult to interpret as causal effects of incarceration on entrepreneurship. The key challenge here is that there may be nonrandom selection of individuals into incarceration. Some of the characteristics of formerly incarcerated individuals that place them at high risk of incarceration may also affect their likelihood of engaging in entrepreneurship.

TABLE 2
DESCRIPTIVE STATISTICS OF ENTREPRENEURSHIP BY PRIOR INCARCERATION STATUS AND RACE, 2010

	SUBSAMPLE BY RACE							
	FULL SAMPLE		Black		White			
	Never Incarcerated	Formerly Incarcerated	Never Incarcerated	Formerly Incarcerated	Never Incarcerated	Formerly Incarcerated	Never Incarcerated	Formerly Incarcerated
Entrepreneurship:								
Self-employment (%)	11.48	18.61	10.90	18.67	12.43	19.42		
Self-employment w/incorporation or employees (%)	3.67	7.58	4.07	7.33	3.71	7.77		
No. of observations	7,187	486	1,904	164	3,651	212		

NOTE.—Among the 8,984 unique individuals, currently incarcerated individuals and individuals who permanently dropped out of the survey were excluded from the sample.

Any 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 (Caspi et al. 1998; Fairlie 2002; Kim, Aldrich, Keister 2006). 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 several mechanisms that may explain the observed relationship between incarceration and employment such as 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. Thus, to identify a causal relationship between incarceration and entrepreneurship and establish an explanatory mechanism, we utilize several research designs and a unique empirical setting.

First, we conduct fixed effects regression models. Following Western (2002), we include individual fixed effects to control for time-invariant, observed and unobserved, individual traits that may be correlated with incarceration and entrepreneurship. Individual fixed effects absorb time-invariant traits like cognitive ability, impulsivity, and risk preferences as well as fixed demographic characteristics like race, ethnicity, and gender (Western 2002; Fairlie 2002).

In addition to fixed effects, we exploit a quasi-natural experiment provided by the staggered implementation of a policy shock that generates an exogenous increase of paid-employment opportunities for formerly incarcerated individuals in policy-adopting localities. Specifically, we use the staggered enactment of ban-the-box, which, as of 2015, has been adopted by public employers in 18 states, Washington DC, and 133 cities and counties in the United States. Among these localities, 13 states, Washington DC, and 18 cities and counties have extended their ban-the-box policies to private employers as well. While ban-the-box policies for both private and public employers have a wider reach to society and a larger impact on individuals with criminal records and incarceration experiences (Rose 2021), narrowing the focus to private ban-the-box policies within our time frame significantly reduces the size of the treatment group. In addition, there is evidence that public employers have greater access to criminal records than private employers do (Jacobs 2015) and that private employers are more likely to follow public employers’ ban-the-box policies, increasing the significance of examining the limited public ban-the-box policy (Jacobs 2006). Given that public ban-the-box policies are weaker policy interventions than private ban-the-box policies, we expect to find stronger results when examining the effects of the adoption of ban-the-box policies for private employers. In other words, finding supportive results from a public ban-the-box policy can be interpreted as a conservative result. Therefore, we focus on

public ban-the-box policies within our timeframe, which results in 18 states and 133 counties/cities that implement the policy. Table S2 shows the list of states, cities, and counties that have adopted a ban-the-box policy and the effective dates for public and private ban-the-box policies.

We are able to leverage the staggered adoption of ban-the-box policies to identify a causal mechanism of incarceration on entrepreneurship for several reasons. The implementation of this policy exogenously increases employment opportunities for formerly incarcerated individuals in impacted localities. A ban-the-box policy prohibits employers from conducting criminal background checks or inquiring about criminal histories until later in the hiring process—typically at the time of the conditional job offer. The rationale behind deferring access to this information is that the initial assessment of job applicants will occur without the stigma of a criminal record, ultimately improving employment odds for those with records. Scholars have found supportive evidence that despite employers' initial reluctance to hiring individuals with criminal records, personal contact helped them see past criminal stereotypes and judge applicants based on their qualifications and true disposition (Pager et al. 2009; Craigie 2020). Thus, we expect the implementation of ban-the-box policies to reduce the discrimination that individuals with criminal records, and more narrowly formerly incarcerated individuals, face from employers. Past work finds evidence that the ban-the-box initiative provides a better chance at employment by removing the conviction history question for both job applicants with criminal records and formerly incarcerated applicants (Craigie 2020; Avery and Hernandez 2018; Shoag and Veuger 2016). We further elaborate on the potential mismatch between a ban-the-box policy that applies more broadly to all individuals with criminal records and our focus on the subset of individuals with incarceration experience in the methods and discussion sections below.

As the implementation of a ban-the-box policy exogenously changes the level of labor market discrimination for formerly incarcerated individuals, we are able to identify whether labor market discrimination plays a role in formerly incarcerated individuals engaging in entrepreneurship by comparing the level of entrepreneurship engagement in localities with and without a ban-the-box policy. We argue that the main mechanism through which the adoption of a ban-the-box policy impacts entrepreneurial entry is through the change in labor market discrimination for formerly incarcerated individuals. A 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 a ban-the-box law serves as a 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. Given this proposed mechanism, we expect to find

formerly incarcerated individuals in ban-the-box jurisdictions to have lower entrepreneurship rates because of increased employment opportunities, compared to formerly incarcerated individuals in jurisdictions without ban-the-box policies.

Furthermore, ban-the-box policy allows us to identify the salience of labor market discrimination as the underlying mechanism for entrepreneurship by race. As Black individuals face greater employer discrimination from their incarceration records (Pager 2003), ban-the-box policy is often presented as an important tool for reducing racial disparity by particularly improving access to employment for formerly incarcerated Black individuals (Pinar 2014; Clarke 2012). Prior empirical work has found formerly incarcerated Black individuals to experience greater increases in employment opportunities from the enactment of ban-the-box policies, compared to formerly incarcerated White individuals (e.g., Flake 2019). Therefore, given our mechanism, we expect the negative impact of ban-the-box policy on entrepreneurial entry to be particularly stronger for formerly incarcerated Black individuals. Formerly incarcerated Black individuals will experience greater increases in employment opportunities from the implementation of ban-the-box, which will lead to a greater decrease in entrepreneurship, compared to formerly incarcerated White individuals. This racialized impact of ban-the-box policy on entrepreneurship can, thus, help us understand whether and how much labor market discrimination serves as the main driver for entry into entrepreneurship by race.

While the implementation of the ban-the-box policy offers an opportunity to tease apart the main causal mechanism of labor market discrimination from other potential mechanisms that have been documented to influence labor market choices such as social networks or human capital, there remain potential challenges of pinpointing changes in labor market discrimination as the only pathway through which ban-the-box policy impacts entrepreneurship by formerly incarcerated individuals. For example, ban-the-box may carry symbolic value that formerly incarcerated individuals are worthy of a second chance and induce improvements in the support infrastructure around re-entry such as increased job placement assistance or funding for job search support (Flake 2019), which may in turn enhance employment opportunities and reduce entrepreneurial entry for the formerly incarcerated. We are able to address this alternative mechanism by focusing on the racialized effects of ban-the-box. If changes around such job assistance programs for the formerly incarcerated are the main mechanism, we would expect similar ban-the-box effects on entrepreneurial entry regardless of race. If our suggested mechanism of changes in employer discrimination is the key driver, we expect stronger negative effects of ban-the-box on entrepreneurial entry for formerly incarcerated Black individuals. While finding racialized results may not fully rule out changes in job placement assistance as a mechanism altogether, they

provide support for changes in employer discrimination as the main driver of changes in entrepreneurial entry.

At the same time, the implementation of ban-the-box policies may also lead to changes in the infrastructure around entrepreneurship for the formerly incarcerated people. As the ban-the-box policy underlines the importance of fair chances for individuals with criminal records, the implementation of the policy may open doors for formerly incarcerated individuals to readily access entrepreneurial resources such as loans, investors, accelerators, or incubator programs. If this mechanism is a pathway through which ban-the-box policies impact entrepreneurial entry among the formerly incarcerated individuals, we would expect to find ban-the-box policy enactments to increase, rather than decrease, the entrepreneurial entry of formerly incarcerated people. Thus, if our results show that ban-the-box policies negatively impact entrepreneurial entry of formerly incarcerated individuals, we can infer changes in entrepreneurial landscape is not the key driver of changes in entrepreneurial activity of formerly incarcerated people. Yet, finding that formerly incarcerated individuals are less likely to engage in entrepreneurship in ban-the-box jurisdictions does not rule out that ban-the-box may simultaneously lead to changes in entrepreneurial infrastructure for formerly incarcerated individuals. Rather, we can interpret such findings to suggest that, despite improvements in the entrepreneurial landscape for formerly incarcerated individuals that may be occurring in tandem, the mitigation of employer discrimination and improved employment opportunities has an overwhelming impact on lowering the entrepreneurial engagement of formerly incarcerated individuals.

Another potential concern is whether the adoption of a ban-the-box policy is a function of a locality's entrepreneurship rate, employment rate, or other unobservable traits. To address this concern, we first verify that each adopting locality is well balanced in its share of formerly incarcerated and never incarcerated individual-year observations. We further validate that the treatment (ban-the-box implemented) and control (no ban-the-box implemented) localities had no preexisting trends in entrepreneurship or employment for formerly incarcerated and never-incarcerated individuals before the year of policy adoption. No preexisting trends confirm that the adoption of ban-the-box is exogenous to preexisting entrepreneurship or employment trends in the locality.

Methodologically, we use a triple-difference approach. We compare the changes in entrepreneurship rates based on the three differences of (1) formerly incarcerated versus never incarcerated, (2) ban-the-box localities versus localities without ban-the-box, and (3) before versus after implementation of ban-the-box. Thus, the triple-difference model allows us to compare the entrepreneurial likelihood for formerly incarcerated individuals relative to the entrepreneurial likelihood of never-incarcerated individuals, in ban-the-box localities versus localities without ban-the-box, and after ban-the-box policies go into effect.

For example, suppose we want to measure the effect of New York City's 2011 enactment of ban-the-box policy on entrepreneurship rates for formerly incarcerated people compared to never-incarcerated people. To do so we would first compute the difference in entrepreneurship rates post-2011 versus pre-2011 for New York City (a "treated" locality). We will call this the "computed NYC difference" for the sake of this illustration. Yet other events may have happened around 2011, potentially influencing changes in entrepreneurship rates—for example, a nationwide decrease of entrepreneurial start-up costs. To account for such contemporaneous effects, we use as a control group any locality that has not implemented a ban-the-box policy, and we compute the corresponding difference in entrepreneurship rates post- versus pre-2011. We will call this the "computed control difference." The difference between the computed NYC difference and the computed control difference provides an estimate of the effect of New York City's 2011 enactment of its ban-the-box policy on entrepreneurship rates, controlling for contemporaneous changes that are due to changes in broad economic conditions. Finally, we would use interaction effects (*Past Incarceration* $\times$ *Ban-the-Box*) to examine this comparative effect.

Our model further accounts for the staggered nature of the reform such that the composition of the treatment and control groups changes over time as more localities are progressively "treated." This means that our sample includes localities that become eventually treated over the period studied (266 localities) as well as never-treated municipalities (1,038 municipalities). We follow Bertrand and Mullainathan (2003) and their application of the difference-in-differences methodology in the presence of staggered treatments at the regional level. Formally, we run a triple-difference regression by using the model:

$$\begin{aligned} Entrepreneurship_{it} = & \alpha + \beta_1 Past\ Incarceration_{it} + \beta_2 Ban\ the\ Box_{it} \\ & + \beta_3 Past\ Incarceration_{it} \times Ban\ the\ Box_{it} \\ & + c_i + c_t + c_{region} + f(time)_t \times c_{region} + \beta_4 X_{it} + \epsilon_{it} \end{aligned}$$

where *Entrepreneurship_{it}* represents whether survey respondent *i* engaged in entrepreneurship at year *t* for the period 1997–2015, *Past Incarceration_{it}* measures whether respondent *i* was formerly incarcerated at time *t*, *Ban the Box_{it}* is 1 when the county/city of residence for respondent *i* at time *t* has adopted a ban-the-box policy and 0 otherwise, *Past Incarceration_{it}* $\times$ *Ban the Box_{it}* is the interaction of prior incarceration and the enactment of a ban-the-box policy. We include year fixed effects (*c_t*) to control for macrosocioeconomic fluctuations that affect the employment opportunity set and incarceration-related discrimination. We include region fixed effects (*c_{region}*) at the city/county level to control for differences in employment opportunities, local

regulations regarding business start-up costs, and other entrepreneurial entry barriers across regions. To allow for different trends across regions we include an interaction between a linear function of time and the region fixed effect ($f(\text{time})_i \times c_{\text{region}}$), an approach that follows Besley and Burgess (2004) and Chatterji and Seamans (2012). We also include individual fixed effects (c_i) to control for time-invariant individual characteristics such as gender, race, and cognitive ability, as well as X_{it} , a vector of time-variant control variables, and ϵ_{it} , the error term (Wooldridge 2007).

In this triple-difference specification, *Past Incarceration*_{*it*} identifies the extent to which prior incarceration produces a shift in the probability of entrepreneurial engagement. *Ban the Box*_{*it*} creates a standard differences-in-differences where the first difference compares the effect on the dependent variable before and after the legislative shock, and the second difference takes the difference in the first difference across individuals residing in the treated and nontreated localities. The interaction between *Past Incarceration*_{*it*} and *Ban the Box*_{*it*} allows the difference-in-difference coefficient of *Ban the Box*_{*it*} to vary by past incarceration status, producing the triple difference. Thus, prior incarceration in localities without ban-the-box produces a shift in the probability of entrepreneurial engagement by β_1 percentage points. The implementation of ban-the-box policy shifts the probability of entrepreneurial engagement for never-incarcerated individuals by β_2 percentage points. Finally, $\beta_1 + \beta_2 + \beta_3$ represents the shift in the probability of entrepreneurial engagement for formerly incarcerated individuals in ban-the-box-implemented localities.

Although our methodology of utilizing the triple-difference method with a quasi-exogenous policy shock addresses most endogeneity problems, there is a possible limitation of using the ban-the-box policy as a change to employer discrimination for formerly incarcerated individuals. Ban-the-box policies apply to the broader population of individuals with criminal records, while the focus of our study is the subset of individuals with criminal records who have been formerly incarcerated in jails or prisons. Some individuals with criminal records have never spent time in prison, serving sentences under felony probation or less severe sanctions such as fines (Shannon et al. 2017). This suggests a potential mismatch between the group of individuals impacted by ban-the-box policies (individuals with criminal records) and the treatment group in this study (formerly incarcerated individuals), implying that some individuals in the control group (never-incarcerated individuals with criminal records) will experience the same impact from the ban-the-box policy as the treatment group (formerly incarcerated individuals).

However, this potential mismatch does not distort the interpretation of our results for three reasons. First, our study measures past incarceration as spending time not only in prisons but also jails, minimizing the number

of formerly incarcerated individuals that are counted as never incarcerated. Second, the never-incarcerated individuals with criminal records in the control group who are also impacted by a ban-the-box policy will dampen the treatment effect of prior incarceration on entrepreneurship, by making our statistical results underestimate the actual treatment effect. Thus, this type of mismatch would inflate the standard errors and bias the coefficients of prior incarceration to zero. Last, many employer surveys such as Holzer et al. (2006) show employers are more concerned about hiring individuals who were formerly incarcerated than they are individuals with criminal records yet no incarceration experience. This suggests that those most affected by ban-the-box policies are individuals with incarceration experiences, more so than individuals with criminal records but no incarceration experience. Yet, we interpret our results with caution and are alert to the potential disconnect between incarceration and criminal records. We address this further in the discussion section.

RESULTS

Table 3 shows the results on how entrepreneurial entry differs by prior incarceration status. The main finding is that formerly incarcerated individuals are more likely to become entrepreneurs compared to individuals who have never been incarcerated. Having been formerly incarcerated increased one's likelihood of becoming an entrepreneur by 5.2 percentage points (table 3, model 1). This holds controlling for individual characteristics such as years of education, ability test scores, family and individual annual earnings ($t - 1$), number of months worked ($t - 1$), gender, and race (table 3, model 2). Table 3, model 3 shows similar results after adding individual fixed effects, which implies that prior incarceration increases one's likelihood of entrepreneurship controlling for both observable and nonobservable time-invariant individual characteristics. While the average never-incarcerated individual has a 9.41% likelihood of becoming an entrepreneur, having been formerly incarcerated increases one's likelihood to enter entrepreneurship by more than 41%, to 13.31% ($9.41\% + 3.90\%$) (table 3, model 3).

We find consistent results when operationalizing entrepreneurship based on our narrower definition, as self-employment that is either incorporated or self-employment with employees (table 3, model 4). While the average individual who has never been to prison has a 2.37% likelihood of becoming a narrowly defined entrepreneur, having an incarceration record nearly doubles one's entrepreneurial likelihood to a 4.57%. In table 3, model 5, we show the results for self-employment with no employees nor incorporation. We find that while the average individual who has never been to prison has a 7.04% likelihood of engaging in self-employment without employees and incorporation, having an incarceration record increases this likelihood by

TABLE 3
UNSTANDARDIZED COEFFICIENTS FROM LINEAR REGRESSION OF ENTREPRENEURSHIP
ON INCARCERATION

	ENTREPRENEURSHIP (Self-Employment)			SELF- EMPLOYMENT WITH INCORPORATION OR EMPLOYEES	SELF- EMPLOYMENT W/OUT INCORPORATION AND EMPLOYEES
	(1)	(2)	(3)	(4)	(5)
Past incarceration	.052*** (.005)	.048***	.039*** (.006)	.022*** (.006)	.017* (.008)
ln(Years of education)		-.054*** (.008)	.006 (.010)	.007 (.005)	-.001 (.009)
ln(Annual earnings) (<i>t</i> -1) . .		-.005*** (.001)	-.005*** (.001)	-.002*** (.000)	-.003*** (.001)
ln(Family earnings) (<i>t</i> -1) . .		-.000 (.000)	.001* (.000)	.000 (.000)	.001+ (.000)
No. of months worked (<i>t</i> -1)		.004*** (.000)	.003*** (.000)	.002*** (.000)	.002*** (.000)
Local unemployment rate		.002* (.001)	.001 (.001)	.001 (.000)	.000 (.001)
Female		-.012*** (.002)			
Black		-.009** (.003)			
Hispanic		-.021*** (.003)			
Asian		-.025*** (.007)			
Multiracial		-.020* (.010)			
ln(ASVAB ability test)		.004* (.002)			
Individual fixed effects . . .	N	N	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y
Location fixed effects	Y	Y	Y	Y	Y
<i>N</i>	106,552	106,552	106,483	106,483	106,483
Adjusted <i>R</i> ²	.029	.032	.351	.260	.285

NOTE.—The differences in the number of observations is due to dropping singletons when running linear regression models with multiple fixed effects. Our results are robust to keeping the singletons in our regression analyses. Location fixed effects and local unemployment rate are at the county/city level. Robust SEs are used in these models.

+ *P* < .10.

* *P* < .05.

** *P* < .01.

*** *P* < .001.

24% to an 8.74% likelihood.⁷ These results show that having an incarceration record increases your likelihood of entrepreneurship, both broadly and narrowly defined. In addition, the comparison of the effect sizes in models 4 and 5 suggests that increase of entrepreneurship for individuals with incarceration records may be primarily driven by self-employment with businesses that are either incorporated or have employees.

We also examined what types of businesses are founded by formerly incarcerated entrepreneurs in terms of occupational codes and number of employees. Formerly incarcerated entrepreneurs are most likely to engage in entrepreneurship in occupations such as construction trade and extraction workers (24.03%), personal care and service workers (13.42%), cleaning and building service (11.41%), installation, maintenance, and repair workers (8.99%), and transportation and material moving workers (8.59%). We provide the full list of occupation codes, as well as economic sectors, in appendix A. Our results are in line with contemporary work (see Hwang 2021, 2022; Finlay, Mueller-Smith, and Street 2023) that show that, compared to never-incarcerated entrepreneurs, formerly incarcerated entrepreneurs are more likely to enter low capital-intensive industries such as construction, waste management, or other services. We further find that among the formerly incarcerated entrepreneurs who have employees (31.05% of all formerly incarcerated entrepreneurs), 88.4% have fewer than 10 employees. In comparison, among never-incarcerated entrepreneurs who have employees (24.59% of all never-incarcerated entrepreneurs), 79.8% have fewer than 10 employees. We consider the theory and policy implications of these differences in the discussion section.

Tables 4 and 5 show the triple-difference analyses with the implementation of a ban-the-box policy. The results provide evidence for our causal claim and shed light on an underlying mechanism of why formerly incarcerated individuals choose entrepreneurship at higher rates compared to never-incarcerated individuals. First, in table 4 we test the effects of incarceration and ban-the-box policies on employment for formerly incarcerated individuals, by examining the number of months employed per year in the paid-employment sector. While table 4 reports linear regression models, we also ran robustness checks with quantile (median) regressions to account for potential outliers and find similar results.

In table 4, we confirm that prior incarceration decreases the number of months employed in paid-employment by 5.03% for the full population (table 4,

⁷ We further dichotomize this narrowly defined entrepreneurship to test whether prior incarceration status has different effects on entrepreneurship with employees and incorporated entrepreneurship. We find that while prior incarceration status increases the likelihood of both self-employment with employees and incorporated self-employment, the increase is mostly driven by increases in self-employment with employees.

model 1). To be more specific, while the average never-incarcerated individual worked in paid employment for 7.75 months in a year, prior incarceration decreased employment by 0.39 months (or 1.56 weeks). This negative incarceration effect on employment is amplified for Black individuals, where incarceration decreases employment by 11% (0.78 months or 3.12 weeks) (table 4, model 2). The size of this negative incarceration effect can be interpreted more clearly considering other effects in the model (we run additional analyses where education is specified as highest degree attained and unemployment rate of residence is coded as dummy variables for the ease of interpretation). Our results suggest that the economic significance of the negative effect of incarceration on employment exceeds the negative effects of living in a high unemployment region or dropping out of high school. In addition, the effect sizes from our findings are consistent with prior findings on the incarceration effect on employment, which suggests the negative incarceration effect to be 0%–3% (Kling 1999, 2006), 4% (Grogger 1992), 5%–9% (Western and Beckett 1999), and 5%–12% (Waldfogel 1994).

While incarceration imposes a negative main effect on employment, this negative impact of incarceration is mitigated when a ban-the-box policy is implemented, as employment for formerly incarcerated individuals increases by 0.5 months (two weeks) in states or counties/cities where the policy is adopted (table 4, model 1), offsetting the negative incarceration effect. Thus, when residing in jurisdictions with a ban-the-box policy, formerly incarcerated individuals have greater employment compared to before its implementation. This finding suggests that when employers do not view criminal or incarceration records until later in the hiring process, formerly incarcerated individuals are more likely to secure jobs. This provides evidence of how the stigma of the criminal or incarceration record is an important driver of the lack of employment for formerly incarcerated individuals.

Furthermore, we find different effects of incarceration and ban-the-box policies by race. Models 2 and 3 of table 4 suggest that formerly incarcerated Black individuals face greater discrimination from employers compared to formerly incarcerated White individuals, supporting previous findings (Pager 2003). Specifically, our results show that the negative incarceration effect is larger for Black individuals (table 4, model 2), whose employment is reduced by around 11% by incarceration. While the average never-incarcerated Black individual works in paid employment for 6.9 months in a year, prior incarceration decreases employment by 0.78 months (or 3.12 weeks) after release. On the other hand, table 4, model 3, shows that the negative incarceration effect for White individuals is not statistically significant, confirming prior studies on the racialized impact of incarceration on employment.

The main finding in table 4 is that the adoption of ban-the-box mitigates employment discrimination for formerly incarcerated Black individuals but does not significantly increase employment for formerly incarcerated White

Labor Market Discrimination

TABLE 4
UNSTANDARDIZED COEFFICIENTS FROM LINEAR REGRESSION OF NUMBER OF MONTHS IN PAID
EMPLOYMENT ON INCARCERATION AND BAN-THE-BOX POLICY IMPLEMENTATION

	NO. OF MONTHS IN PAID EMPLOYMENT		
	Full Sample (1)	Subsample by Race	
		Black (2)	White (3)
Past incarceration	−.392** (.133)	−.780*** (.236)	−.097 (.187)
Ban-the-box	.016 (.063)	−.227+ (.131)	.072 (.085)
Past incarceration × ban-the-box	.499* (.224)	1.293** (.410)	−.170 (.348)
ln(Years of education)	3.208*** (.153)	2.847*** (.332)	3.378*** (.194)
ln(Annual earnings) (<i>t</i> -1)	.492*** (.010)	.386*** (.016)	.556*** (.015)
ln(Family earnings) (<i>t</i> -1)	.088*** (.007)	.119*** (.011)	.058*** (.012)
Local unemployment rate	−.040*** (.010)	−.101*** (.022)	−.025* (.013)
Individual fixed effects	Y	Y	Y
Year fixed effects	Y	Y	Y
Location fixed effects	Y	Y	Y
Location time trends	Y	Y	Y
<i>N</i>	106,483	28,196	61,249
Adjusted <i>R</i> ²	.445	.469	.429

NOTE.—Location fixed effects, location time trends, and local unemployment rate are at the county/city level. Robust SEs are used in these models.

+ $P < .10$.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

individuals.⁸ By comparing the interaction term of *Ban-the-Box* and *Past Incarceration* for both the Black and White populations, we show that the adoption of ban-the-box boosts employment for formerly incarcerated Black individuals (table 4, model 2) but has no statistically significant effect on formerly incarcerated White individuals (table 4, model 3). Specifically, the implementation of ban-the-box policy increases employment for the formerly incarcerated Black individuals by 1.06 months (or more than 4 weeks), fully mitigating the negative incarceration effect (table 4, model 2). We find no significant ban-the-box policy effects on formerly incarcerated White individuals.

⁸ We find that a ban-the-box policy negatively impacts never-incarcerated Black individuals by decreasing their employment. While the interpretation of this result is beyond the scope of this study, this result is consistent with prior research on ban-the-box and statistical discrimination, such as Agan and Starr (2018) and Doleac and Hansen (2020). We discuss further in the discussion section of this article.

Figure 1 summarizes the effect of ban-the-box policy on employment for formerly incarcerated Black individuals. The solid horizontal line represents the baseline employment of formerly incarcerated Black individuals in jurisdictions that never implement ban-the-box policy. The dashed line shows employment for formerly incarcerated Black individuals in jurisdictions that implement ban-the-box policy at time T (labeled ban-the-box). Each vertical line shows the 95% confidence intervals. 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 employment pretrends between the jurisdictions that implemented and did not implement a ban-the-box policy. Also, figure 1 shows that at time T , when a ban-the-box policy is implemented, employment for formerly incarcerated individuals sharply increased in participating jurisdictions. This increase of employment for formerly incarcerated Black individuals in ban-the-box implemented jurisdictions 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 increases the likelihood of paid employment for formerly incarcerated Black individuals.

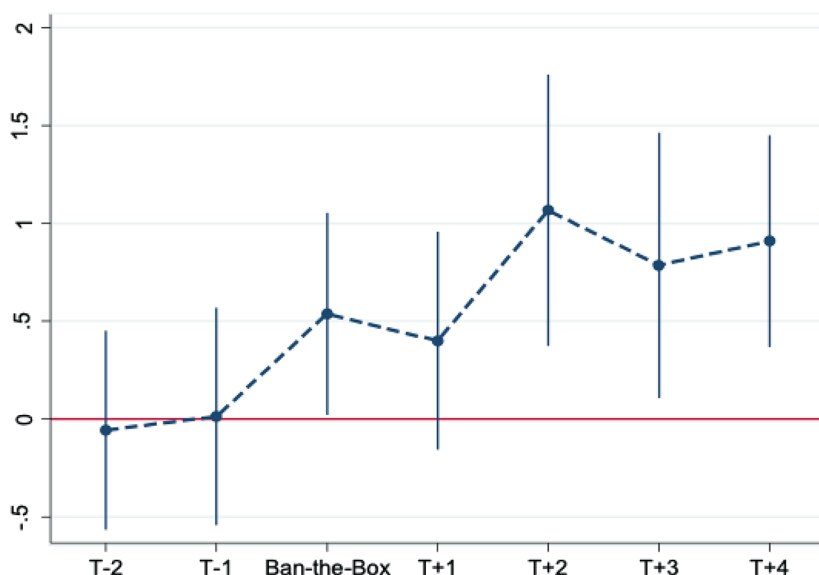


FIG. 1.—Paid employment trend of formerly incarcerated Black individuals before and after ban-the-box policy implementation. This dashed line shows the relative number of months in paid employment for formerly incarcerated Black individuals in states and counties where ban-the-box was implemented in year T_0 , compared to the baseline (solid horizontal line normalized to zero) which represents the employment of formerly incarcerated Black individuals in states and counties where ban-the-box was not implemented.

Table 5 shows the triple difference 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. Consistent with table 3, table 5, model 1 shows that past incarceration increases one's likelihood of engaging in entrepreneurship by 3.8 percentage points, compared to never-incarcerated individuals. Yet, the coefficient for the interaction of *Past Incarceration* and *Ban-the-Box* shows that the exogenous implementation of ban-the-box does not significantly change the incarceration effect on the likelihood of entrepreneurial entry.

We next conducted subsample analyses by race (table 5, models 2 and 3). The subsample analyses first show that when ban-the-box policy is not implemented, formerly incarcerated individuals from both populations are

TABLE 5
UNSTANDARDIZED COEFFICIENTS FROM LINEAR REGRESSION OF ENTREPRENEURSHIP
ON INCARCERATION AND BAN-THE-BOX POLICY IMPLEMENTATION

	ENTREPRENEURSHIP (SELF-EMPLOYMENT)		
	Full Sample (1)	Subsample by Race	
		Black (2)	White (3)
Past incarceration	.038*** (.010)	.034* (.018)	.030* (.014)
Ban-the-box	.007 (.004)	.011 (.009)	.005 (.006)
Past incarceration $\times$ ban-the-box	.009 (.018)	-.063* (.032)	.036 (.029)
ln(Years of education)	.002 (.010)	.042* (.020)	-.011 (.013)
ln(Annual earnings) (<i>t</i> -1)	-.005*** (.001)	-.001 (.001)	-.006*** (.001)
ln(Family earnings) (<i>t</i> -1)	.001 ⁺ (.000)	-.001 (.001)	.001 (.001)
No. of months worked (<i>t</i> -1)	.003*** (.000)	.004*** (.000)	.003*** (.000)
Local unemployment rate	.000 (.001)	.003* (.001)	.000 (.001)
Individual fixed effects	Y	Y	Y
Year fixed effects	Y	Y	Y
Location fixed effects	Y	Y	Y
Location time trends	Y	Y	Y
<i>N</i>	106,483	28,196	61,249
Adjusted <i>R</i> ²	.353	.382	.352

NOTE.—Location fixed effects, location time trends, and local unemployment rate are at the county/city level. Robust SEs are used in these models.

⁺ *P* < .10.

* *P* < .05.

** *P* < .01.

*** *P* < .001

more likely to engage in entrepreneurship compared to never-incarcerated individuals (3.4 percentage points more for formerly incarcerated Black individuals and 3.0 percentage points more for formerly incarcerated White individuals). However, only formerly incarcerated Black individuals are less likely to take part in entrepreneurship after the ban-the-box policy is adopted. This is consistent with the results from table 4 showing evidence that not only are formerly incarcerated Black individuals the most discriminated against in the labor market; they also experience the greatest increase in labor market opportunities through ban-the-box implementation. Specifically, the implementation of ban-the-box policy decreases the likelihood of entrepreneurship engagement for formerly incarcerated Black individuals by 5.2 percentage points, fully mitigating the positive incarceration effect on entrepreneurship. In contrast, formerly incarcerated White individuals do not see a statistically significant impact of ban-the-box policy implementation on their likelihood of engaging in entrepreneurship. Overall, the results from table 5 show that formerly incarcerated Black 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 the policy is implemented.

Figure 2 summarizes the effect of ban-the-box policy on entrepreneurship for formerly incarcerated Black individuals. The solid horizontal line at zero represents the baseline entrepreneurship likelihood of formerly incarcerated Black individuals in states and counties/cities that never implemented the ban-the-box policy. The dashed line shows the relative entrepreneurship likelihood of formerly incarcerated Black individuals in states and counties/cities that implement a ban-the-box policy at time T (labeled "ban-the-box"). The vertical lines represent the 95% confidence intervals. Like 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 in entrepreneurship between the jurisdictions 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 Black individuals sharply decreases in counties/cities and states that implement ban-the-box. This decrease of entrepreneurship for formerly incarcerated Black individuals in ban-the-box-implemented jurisdictions continues after time $T + 1$.

These results from tables 4 and 5 and figures 1 and 2 provide support for our hypotheses that formerly incarcerated Black individuals transition into entrepreneurship as a response to labor market discrimination. The racialized findings particularly show that entrepreneurship is a response to labor market discrimination particularly for formerly incarcerated Black individuals, yet not significantly for formerly incarcerated White individuals. While the results support changes in labor market discrimination as the most parsimonious main mechanism through which ban-the-box brings about such

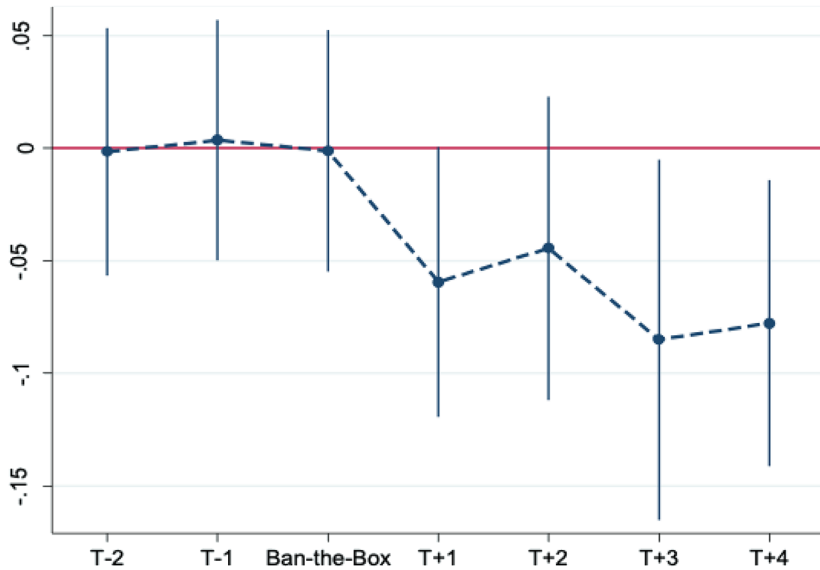


FIG. 2.—Entrepreneurship trend of formerly incarcerated Black individuals before and after ban-the-box policy implementation. This dashed line shows the relative probability of entrepreneurship for formerly incarcerated Black individuals in states and counties where ban-the-box was implemented in year T0, compared to the baseline (solid horizontal line normalized to zero) which represents the probability of entrepreneurship of formerly incarcerated Black individuals in states and counties where ban-the-box was not implemented.

impacts for formerly incarcerated individuals, this does not altogether rule out other mechanisms that may take place in tandem. Although this does not pose a threat to identifying the causal effect of ban-the-box, it can add complexities to the implications of our results. We address this further in the discussion section.

Table 6 shows the results on how past incarceration and entrepreneurship affects earnings, both in terms of logged annual earnings (table 6, models 1–3) and logged hourly earnings (table 6, models 4–6). We examine both logged annual and hourly earnings because entrepreneurs have greater flexibility in adjusting work hours (Hurst and Pugsley 2011) and higher annual earnings from entrepreneurship by formerly incarcerated individuals may be driven by entrepreneurs' longer work hours rather than increased earnings per hour. As it is straightforward that earnings from entrepreneurship will be higher than earnings from unemployment, we test our earnings analyses with a more limited conservative sample of individual-year observations, where the individual was involved in at least part-time work (more than an average of 20 hours per week). For robustness, we run our analyses with different cutoffs, such as limiting our sample to those who work more

TABLE 6
UNSTANDARDIZED COEFFICIENTS FROM LINEAR REGRESSION OF LOGGED HOURLY EARNINGS
AND LOGGED ANNUAL EARNINGS ON INCARCERATION AND ENTREPRENEURSHIP

	LN(ANNUAL EARNINGS)			LN(HOURLY EARNINGS)		
	Full Sample (1)	Subsample by Race		Full Sample (4)	Subsample by Race	
		Black (2)	White (3)		Black (5)	White (6)
Past incarceration	-.207*** (.037)	-.196** (.074)	-.210*** (.046)	-.163*** (.016)	-.170*** (.034)	-.139*** (.021)
Entrepreneurship	-.134*** (.014)	-.141*** (.032)	-.115*** (.017)	-.076*** (.010)	-.058** (.021)	-.093*** (.013)
Past incarceration × entrepreneurship	.144** (.056)	.254* (.118)	.166* (.067)	.184*** (.032)	.158** (.060)	.235*** (.046)
ln(Years of education)	2.040*** (.039)	1.760*** (.088)	2.102*** (.048)	.927*** (.019)	.826*** (.039)	.922*** (.025)
No. of months worked	.076*** (.001)	.071*** (.002)	.079*** (.001)			
ln(Family earnings) (<i>t</i> -1) . . .	.018*** (.002)	.014*** (.003)	.021*** (.003)	.013*** (.001)	.009*** (.001)	.016*** (.002)
Local unemployment rate	-.010*** (.002)	-.013** (.005)	-.010*** (.003)	-.004*** (.001)	-.006** (.002)	-.003* (.001)
Individual fixed effects . . .	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
Location fixed effects	Y	Y	Y	Y	Y	Y
<i>N</i>	86,503	22,904	49,735	93,038	24,787	53,300
Adjusted <i>R</i> ²	.666	.650	.678	.506	.514	.500

NOTE.—The dependent variables are logged annual earnings (models 1–3) and logged hourly earnings (models 4–6). observations with zero annual or hourly earnings were eliminated, and outliers greater than the value of five times the median were eliminated from the sample. To compare the earnings impact of entrepreneurship in comparison to employment, the base class (entrepreneurship = 0) in all estimations is composed of full-time and part-time salaried individuals, those who worked more than an average of 20 hours per week. Robust SEs are used.

+ *P* < .10.
* *P* < .05.
** *P* < .01.
*** *P* < .001

than a yearly total of 300 hours (Fairlie 1999) or more than 34 hours per week (Hegde and Tumlinson 2021), and find similar results. To test sensitivity to outliers, we also run quantile (median) regressions and find consistent results.

The results in table 6 have four key takeaways. First, we find that formerly incarcerated employees earn less per annum and per hour than their never-incarcerated counterparts. In our results from logged annual earnings, table 6, model 1, shows that formerly incarcerated employees earn 18.7% (($\exp(-0.207) - 1$) $\times$ 100 = -18.7) less than similar never-incarcerated employees (table 6, model 1). This annual earnings penalty persists for both formerly incarcerated Black individuals (table 6, model 2) and formerly

incarcerated White individuals (table 6, model 3). Table 6, model 2 shows that formerly incarcerated Black employees' annual earnings are reduced by around 17.8% compared to their never-incarcerated counterparts. Formerly incarcerated White employees experience a similar reduction of annual earnings of around 19% compared to similar never-incarcerated employees. We find similar results for logged hourly earnings (table 6, models 4–6). Our results are consistent with that of prior research that estimates incarceration to reduce earnings by around 16%–19% (Western 2002).

Second, and most important to our thesis, we find that the employment earnings penalty from past incarceration is mitigated for entrepreneurs. Table 6, model 1, shows that the coefficient of the interaction effect (*Past Incarceration* $\times$ *Entrepreneurship*) is positive and significant, offsetting the negative main effects of *Past Incarceration* and *Entrepreneurship*. Specifically, the results from table 6, model 1, show that the average formerly incarcerated entrepreneur has 1.01% greater annual earnings compared to the average formerly incarcerated employee. While formerly incarcerated employees earn 18.7% less than never-incarcerated employees annually, formerly incarcerated entrepreneurs earn 17.9% less than never-incarcerated employees and 6.1% less than never-incarcerated entrepreneurs annually. Thus, engaging in entrepreneurship helps mitigate the incarceration earnings gap by 4.3% compared to never-incarcerated employees and 67.4% compared to never-incarcerated entrepreneurs. We find consistent results from logged hourly earnings (table 6, model 4), where the average formerly incarcerated entrepreneur has 11% greater hourly earnings compared to the average formerly incarcerated employee.

Third, entrepreneurship mitigates the earnings penalty from incarceration for both the Black population (table 6, models 2 and 5) and White population (table 6, models 3 and 6). Formerly incarcerated Black entrepreneurs earn 11.96% higher annual earnings compared to similar formerly incarcerated Black employees, and formerly incarcerated White entrepreneurs earn 5.23% higher annual earnings compared to similar formerly incarcerated White employees. More specifically, while the income penalty that Black formerly incarcerated employees face in comparison to similar never-incarcerated Black employees is a 17.8% annual earnings gap, Black formerly incarcerated entrepreneurs earn 7.96% less than similar never-incarcerated Black employees and 5.97% more than similar never-incarcerated Black entrepreneurs. Thus, for the Black population, engaging in entrepreneurship helps mitigate the annual incarceration earnings gap with similar never-incarcerated employees by almost 55% and completely offsets the earnings gap with similar never-incarcerated entrepreneurs. We find that while the formerly incarcerated White employees earn 18.94% less than similar never-incarcerated White employees, engaging in entrepreneurship mitigates the incarceration earnings penalty to a 14.7% earnings gap compared to similar never-incarcerated White employees and a 4.3% earnings penalty compared to never-incarcerated White

entrepreneurs. Thus, for the White population, engaging in entrepreneurship helps mitigate the annual earnings gap with similar never-incarcerated White employees by 22.39% and the annual earnings gap with similar never-incarcerated White entrepreneurs by 77.3%.⁹ We find consistent results for logged hourly earnings (table 6, models 4–6).

Fourth, the results in table 6 from logged hourly earnings and logged annual earnings show a negative main effect for engagement in entrepreneurship, where the average entrepreneur earns 14% lower annual earnings and has 8% lower hourly earnings compared to the average salaried counterpart (table 6, models 1 and 4). This penalty for engaging in entrepreneurship is consistent with previous literature that finds that entrepreneurs earn less than their salaried counterparts (e.g., Hamilton 2000; Manso 2016). The entrepreneurial penalty is found for both the subset of Black population (table 6, models 2 and 4) and White population (table 6, models 3 and 5). Our results show that while entrepreneurship leads to earnings penalties for never-incarcerated individuals, for the formerly incarcerated people, entrepreneurship provides a route to overcome their earnings penalty from employers.

For the ease of meaningful interpretation of our results, we find that results are consistent with raw annual earnings and raw hourly earnings in dollars. Specifically, in terms of annual earnings, formerly incarcerated entrepreneurs earn approximately \$2,380 more than formerly incarcerated employees. While formerly incarcerated employees earn approximately \$4,390 less than employees who have never been incarcerated, formerly incarcerated entrepreneurs earn approximately \$2,160 less annually than entrepreneurs who have never been incarcerated. Consider that the median formerly incarcerated employee, who has approximately 11 years of education (less than a high school diploma or a GED) and works a median value of eight months in a year in employment, earns around \$10,080 annually.¹⁰ Given this low annual earnings baseline, a \$2,380 increase of earnings through entrepreneurship amounts to a 24% increase in annual earnings. We find similar results for raw hourly earnings, where formerly incarcerated entrepreneurs earn \$1.50 more per hour compared to similar formerly incarcerated employee. Given that the median formerly incarcerated employee

⁹ We further examine whether entrepreneurship with incorporation or employees and entrepreneurship without incorporation and employees have different income effects for formerly incarcerated individuals. In appendix tables B1 and B2, we provide the mean and median earnings of the two different types of entrepreneurship. We also run regression analyses and find that both types of entrepreneurship have significant positive income effects for the formerly incarcerated individuals, compared to paid employment.

¹⁰ It is worth noting that, according to the *Federal Register* by the Department of Health and Human Services, the poverty guideline for year 1997, the year to which all our dollar values are held to, was \$10,610 for a two-person household. Since the median annual income of a formerly incarcerated person in our data (\$10,080) is similar to that poverty guideline, the added income from entrepreneurship (\$2,380) may be a substantial improvement.

earns around \$6.90 per hour, the hourly earnings increase of \$1.50 amounts to a 22% increase in hourly earnings.

Table 7 shows results for entrepreneurship and recidivism rates for formerly incarcerated individuals. We find supportive evidence that entrepreneurship helps prevent formerly incarcerated individuals from returning to prison, not only in comparison to unemployment but also paid employment. Models 1–6 in table 7 show how entrepreneurship and employment impact the likelihood of recidivism, in comparison to the baseline of unemployment. Model 1 of table 7 focuses on one-year recidivism rates (recidivism within year t) and shows that entrepreneurship decreases the likelihood of recidivism (measured by reincarceration) by 12.6 percentage points, which is a 64% decrease from the average recidivism rate for similar formerly incarcerated individuals who are unemployed (19.6%). Table 7, model 1 further shows that employment also decreases the likelihood of recidivism by 10.8 percentage points, a 55% decrease from the average recidivism rate for similar individuals who are unemployed. The subsample analyses by race suggests that entrepreneurship reduces recidivism rates regardless of race (table 7, models 2 and 3), and the effect sizes of entrepreneurship and employment on recidivism reduction are similar.

Models 4–6 in table 7 show similar results for the longer-term five-year aggregate recidivism rate (recidivism within year t to $t + 4$). These models show that the desistance effect of entrepreneurship becomes stronger than that of employment. Model 4 shows that entrepreneurship decreases the likelihood of recidivism by 13.5 percentage points, which is a 30% decrease from the average recidivism rate for similar incarcerated individuals who are unemployed (46%). This model further shows that employment also decreases the likelihood of recidivism by 7.9 percentage points, a 17% decrease from the average recidivism rate for similar individuals who are unemployed. The negative impact of entrepreneurship on recidivism is particularly pronounced for the Black subpopulation (table 7, model 5), where entrepreneurship decreases recidivism by 23.5% (from 49% to 37.5%) compared to employment, which decreases recidivism only by 10.8% (from 49% to 43.7%). Table 7, model 6 shows similar results for the White subpopulation, entrepreneurship decreases recidivism by 35.4% (from 42.9% to 27.7%) and employment decreases recidivism by a similar 32.2% (from 42.9% to 29.1%). The results from models 4 and 5 show that entrepreneurship is particularly helpful in reducing recidivism in the long term for formerly incarcerated Black individuals.¹¹

¹¹ As prior work has emphasized that the length of work is crucial in reducing recidivism, we also test our theory using a continuous independent variable for *Entrepreneurship* and *Paid Employment* to capture the length of work in each. The results (available upon request) are consistent with the binary variables in table 7, models 1 to 6. We find that while both entrepreneurship and employment are helpful in decreasing recidivism, entrepreneurship has a greater impact particularly for formerly incarcerated Black individuals.

TABLE 7
UNSTANDARDIZED COEFFICIENTS FROM LINEAR REGRESSION OF RECIDIVISM
ON ENTREPRENEURSHIP

	RECIDIVISM (1 year)			RECIDIVISM (5 years)		
	Full Sample	Subsample by Race		Full Sample	Subsample by Race	
		Black (2)	White (3)		Black (5)	White (6)
Entrepreneurship	-.126*** (.018)	-.092** (.035)	-.164*** (.029)	-.135*** (.023)	-.115** (.043)	-.152*** (.034)
Paid employment	-.108*** (.015)	-.091*** (.024)	-.151*** (.026)	-.079*** (.018)	-.053 ⁺ (.027)	-.138*** (.028)
ln(Annual earnings) (<i>t</i> -1) . .	-.002 (.003)	-.002 (.005)	.001 (.005)	-.018*** (.003)	-.013* (.005)	-.023*** (.006)
ln(Years of education) . . .	-.057 (.050)	-.165 (.125)	.013 (.065)	-.162* (.068)	-.480** (.152)	-.130 (.091)
ln(Years since release from incarceration)	-.026** (.009)	-.005 (.017)	-.030* (.014)	-.026* (.011)	.002 (.018)	-.025 (.016)
ln(No. of years incarcerated)	-.003 (.014)	-.050 ⁺ (.027)	-.019 (.024)	.051** (.018)	.015 (.032)	.038 (.032)
ln(No. of times arrested)	.090*** (.014)	.120*** (.029)	.090*** (.021)	.146*** (.019)	.158*** (.036)	.159*** (.029)
Violent crime	.018 (.013)	.024 (.026)	.005 (.021)	.064*** (.017)	.060 ⁺ (.031)	.062* (.027)
Property crime	-.013 (.013)	.033 (.029)	-.015 (.019)	.001 (.017)	.071* (.036)	-.016 (.026)
Drug crime	.004 (.013)	.008 (.025)	-.002 (.018)	-.004 (.016)	.011 (.031)	-.016 (.023)
Other crime	-.014 (.015)	-.078* (.033)	-.020 (.021)	-.020 (.020)	-.086* (.039)	-.039 (.030)
Has child	-.062*** (.010)	-.093*** (.021)	-.042** (.016)	-.058*** (.014)	-.069* (.028)	-.033 (.020)
ln(Family income) (<i>t</i> -1) . .	.001 (.002)	.003 (.003)	-.006 (.004)	-.003 (.002)	-.001 (.004)	-.012** (.004)
Local unemployment rate	.002 (.004)	.007 (.008)	-.001 (.005)	.009 ⁺ (.005)	.009 (.009)	.005 (.006)
Individual controls	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
Location fixed effects	Y	Y	Y	Y	Y	Y
<i>N</i>	4,642	1,577	2,344	4,731	1,631	2,372
Adjusted <i>R</i> ²	.121	.121	.145	.309	.341	.350

NOTE.—The analysis sample includes all formerly incarcerated individuals who were not incarcerated for the entire year. Following prior work on recidivism, individual controls (dummy variables for *Race* and *Sex*, and logged *ASVAB Ability Test Scores*) are included instead of individual fixed effects. Robust SEs are used in these models.

- ⁺ *P* < .10.
- * *P* < .05.
- ** *P* < .01.
- *** *P* < .001

These results are 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: formerly incarcerated Black individuals.

Other variables in our analyses are worth examining. Our results support prior work that recidivism generally decreases with the number of years since release from prison but increases with the number of times and years incarcerated. Perhaps of most interest, higher annual earnings decreased recidivism, particularly when recidivism was measured at a longer time span of five years. An important point is that all models were controlling for annual earnings, suggesting that engagement in entrepreneurship and employment helps desistance through noneconomic means as well. As formerly incarcerated entrepreneurs have higher earnings compared to formerly incarcerated employees, the results suggest that formerly incarcerated entrepreneurs will have even lower recidivism rates than formerly incarcerated employees.

DISCUSSION AND FUTURE DIRECTIONS

We propose a theory of entrepreneurship as a structural response to labor market discrimination for the formerly incarcerated population. We draw attention to entrepreneurship as an alternative labor market route that formerly incarcerated individuals pursue to overcome limitations in the labor market and achieve economic and social integration. Our findings reveal that formerly incarcerated individuals, particularly formerly incarcerated Black individuals, are more likely to become entrepreneurs compared to similar individuals who have never been incarcerated because of diminished employment opportunities in the conventional labor market. In addition, our results show that entrepreneurship offers formerly incarcerated individuals the chance to mitigate both economic and social barriers to successful reentry by reducing the income gap and recidivism rates.

Our findings support a modification to the prevailing narrative on formerly incarcerated individuals, which links the lack of paid employment to the likelihood of unsuccessful reentry. Consistent with this narrative, we verify past scholarship that points to the value of employment for formerly incarcerated people. However, we extend this research by highlighting entrepreneurship as an alternative way for formerly incarcerated individuals to find work, improve their income, and lower the likelihood of returning to prison, in the absence or lack of employment opportunities. While employment remains a key channel to successful reentry, our study introduces entrepreneurship as an underexplored 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 (Pager 2003; Pettit and Western

2004; see also Hirschman and Garbes 2020). This research has consistently shown that formerly incarcerated Black individuals face the greatest stigma and discrimination in the traditional labor market. Our racialized ban-the-box results support prior research on the persistent racial inequality in employment opportunities for formerly incarcerated individuals by showing that Black individuals who have been incarcerated are those who face the highest employment barriers. The results that only formerly incarcerated Black individuals seek entrepreneurship as a response to labor market discrimination further underlines the severity of labor market discrimination as a key driver of pursuing entrepreneurship. This is bolstered by the findings that formerly incarcerated Black individuals reap the greatest advantages from entrepreneurship, emphasizing that entrepreneurship offers an opportunity for economic and social integration.

Our quasi-experimental study design, utilizing the ban-the-box policy shock with a triple-difference method, allows us to disentangle the underlying mechanism linking incarceration and entrepreneurship. This methodology allows us to effectively isolate any individual-level correlates of incarceration and identify the structural changes of labor market discrimination as the main driver of entrepreneurship for the formerly incarcerated. At the same time, we cannot rule out the possibility that ban-the-box policy shocks may also lead to simultaneous enhancement of surrounding infrastructure around reentry and job assistance for formerly incarcerated individuals, as well as changes in the entrepreneurial landscape for formerly incarcerated individuals. However, the racialized patterns of our results strengthen our confidence in interpreting labor market discrimination as a key mechanism. In support of our thesis, changes in labor market discrimination are more likely to affect formerly incarcerated Black people, while an alternative explanation of changes in the infrastructure that co-occur with ban-the-box would affect both Black and White formerly incarcerated people. Nevertheless, future work should verify and extend our findings by more directly measuring employer discrimination to better validate it as a key mechanism that affects entrepreneurship.

Our findings are consonant with classic sociological theories such as those that argue social structures of organizations offer opportunities to counteract inequality (Stinchcombe 1965). This article speaks to the importance of small and low capital-intensive businesses that constitute most entrepreneurial efforts. While such endeavors are often overlooked by investors, policymakers, and researchers for their lack of growth potential or economic impact, this article shows that such businesses offer an entry point for the formerly incarcerated people to reenter society, earn a living, and lower their chances of recidivism. Our work, thus, reengages Granovetter's (1984) attention to the worthiness of examining smaller or "simpler" businesses as valuable organizations across our economy and society.

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 the ongoing discrimination in employment markets. As many studies have found that the lack of employment is one of the main reasons why formerly incarcerated individuals return to prison, this study draws attention to the potential of entrepreneurship as a remedial labor market choice to decrease recidivism. While there have been recent policy initiatives such as the New Start Act (Marks 2019) and efforts from nonprofit organizations and educational institutions to promote entrepreneurship by formerly incarcerated individuals, our research is the first to analyze entrepreneurship and its relationship to labor market discrimination for formerly incarcerated people. Despite our focus on the opportunities provided by entrepreneurship for formerly incarcerated individuals, our study further emphasizes the ongoing labor market discrimination, particularly for formerly incarcerated Black individuals, providing policy implications on the continued need for efforts to mitigate employment discrimination for formerly incarcerated individuals.

Relatedly, our article also has theoretical implications for public policies that affect disadvantaged people, such as those with criminal records. For example, our research speaks to the discussion around the effectiveness of the ban-the-box policy. Scholars, policymakers, and practitioners have debated the effects of the ban-the-box policy, with serious disagreement. While some have argued that it increases discrimination against racial minorities (Agan and Starr 2018; Doleac and Hansen 2020), others have found counter evidence suggesting that this policy reduces discrimination (Clarke 2012; Pinard 2014; Craigie 2020) or has negligible effects (Rose 2021).

Our research is not designed to assess the impact and effectiveness of the ban-the-box policy; however, we have some findings that relate to this conversation. In our study, we observe formerly and never-incarcerated individuals before and after ban-the-box policy enactments, which has been difficult in audit studies with fictitious job applicants (Agan and Starr 2018) and CPS studies that don't report incarceration variables (Doleac and Hansen 2020). We find that ban-the-box policies increase employment for formerly incarcerated individuals, particularly formerly incarcerated Black individuals. But we also have evidence that the policy has a negative effect on employment for Black individuals who have never been incarcerated—results that are consistent with Agan and Starr (2018) and Doleac and Hansen (2020). While our findings are a function of our specific sample, research design, and measurement, they suggest the need for more studies to investigate the impact of ban-the-box policies on both formerly and never-incarcerated

individuals. Furthermore, as our study focuses on the public application of ban-the-box policies for individuals with incarceration records (rather than criminal records), future work on distinguishing the impact of public and private ban-the-box policies on individuals with incarceration records and individuals with criminal records will be helpful in gaining a more comprehensive understanding.

Our study particularly speaks to the distinct national context of the United States, in terms of both incarceration and entrepreneurship. First, the United States not only has the highest incarceration rate and largest incarcerated population in the world but is also distinctive in the openness of access to criminal and incarceration records. Unlike comparable European countries that sharply restrict the dissemination of individual criminal histories, the United States allows, and at times promotes, extensive public access to criminal records (Whitman 2009; Jacobs and Larrauri 2012). This open availability of criminal records in the United States, which is growing with the increase of searchable online databases and digital footprints, exacerbates the stigma and discrimination that formerly incarcerated people face in the labor market (Jacobs 2015; Lageson and Maruna 2018). Therefore, the United States can be a national context that makes employment particularly difficult to obtain with an incarceration record, leading to the importance of finding an alternative route for formerly incarcerated people to find work with less exposure to stigmatization.

Second, our theory leans on the United States' distinct entrepreneurial ecosystem as well as cultural perceptions of entrepreneurship. The decision to start a new business is a product of an individual's perception set within a social, cultural, and political context that can enable or constrain that entrepreneurial decision. The United States has an entrepreneurial ecosystem that is conducive to new business ownership, in terms of characteristics such as lower administrative complexity, greater financial support availability, and greater access to information, entrepreneurial training, and government resources (van der Zwan et al. 2013). Therefore our study, which examines entrepreneurship as a labor market choice to overcome overwhelming stigma and negative labels associated with the incarceration record, leans on the distinct context of incarceration and entrepreneurship in the United States. It remains an interesting question whether entrepreneurship as an alternative to employment is necessary or feasible in other cultural and national contexts, where the public availability of incarceration records and access to entrepreneurship as a labor market choice differ from the United States.

While our article advances entrepreneurship as an alternative viable choice to overcome discrimination for the formerly incarcerated, to outline robust policy implications on entrepreneurship for this population we must address potential barriers and challenges to entrepreneurship. Some research shows that formerly incarcerated entrepreneurs may face barriers to entrepreneurship

such as financial and legal challenges, and the lack of human or social capital (Baskaran 2019; Finlay et al. 2023). Hwang (2021) shows early evidence that while formerly incarcerated individuals do experience greater difficulty securing financial capital, they circumvent this barrier by starting businesses in industries that require low initial capital but offer growth potential, such as service industries (tailor shops, baked good shops, catering businesses, cleaning services, etc.). While our findings that entrepreneurship is a valid labor market choice for formerly incarcerated individuals provides supportive evidence that barriers to entrepreneurship are less likely to impede entrepreneurial entry, such challenges may explain why formerly incarcerated entrepreneurs remain relatively marginalized economically in comparison to never-incarcerated entrepreneurs. This leads to an important implication that reducing the legal, administrative, and financial barriers to entrepreneurship for formerly incarcerated individuals may be crucial in facilitating post-incarceration reintegration.

A growing number of individuals are returning 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 article is an initial attempt to introduce entrepreneurship as an alternative response to the poor employment outcomes from labor market discrimination that often await formerly incarcerated individuals. Future research is needed to expand this emphasis on entrepreneurship by exploring the antecedents, process, and diverse outcomes and meaning of entrepreneurship for formerly incarcerated individuals. While this research focuses on revealing quantitative evidence on entrepreneurship for formerly incarcerated individuals, we also call for future research on qualitative approaches to the entrepreneurial choices of 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.

APPENDIX A

Descriptive Statistics on Industry and Occupation Codes of Formerly Incarcerated Entrepreneurs

TABLE A1
INDUSTRY AND OCCUPATION CODES OF FORMERLY INCARCERATED ENTREPRENEURS

Codes (2002 Census Codes)	<i>N</i>	%
Industry:		
Construction	208	27.92
Other services	180	24.16

TABLE A1 (Continued)

Codes (2002 Census Codes)	<i>N</i>	%
Professional and related services	128	17.18
Entertainment, accommodations, and food services	53	7.11
Transportation and warehousing	46	6.17
Retail trade	32	4.30
Educational, health, and social services	19	2.55
Information and communication	19	2.55
Manufacturing	19	2.55
Agriculture, forestry and fisheries	16	2.15
Wholesale trade	14	1.88
ACS special codes	6	.81
Finance, insurance, and real estate	5	.67
<i>N</i> of observations	745	
Occupation:		
Construction trades and extraction workers	179	24.03
Personal care and service workers	100	13.42
Cleaning and building service	85	11.41
Installation, maintenance, and repair workers	67	8.99
Transportation and material moving workers	64	8.59
Executive, administrative and managerial	46	6.17
Sales and related workers	44	5.91
Entertainers and performers, sports and related workers	23	3.09
Management related	23	3.09
Setter, operators, and tenders	20	2.68
Office and administrative support workers	17	2.28
Health care technical and support	11	1.48
Mathematical and computer scientists	10	1.34
Farming, fishing, and forestry	8	1.07
Media and communication workers	7	.94
Food preparations and serving related	7	.94
Production and operating workers	7	.94
Protective service	6	.81
Lawyers, judges, and legal support workers	5	.67
Entertainment attendants and related workers	5	.67
Acs special codes	4	.54
Physical scientists	3	.40
Engineers, architects, and surveyors	1	.13
Engineering and related technicians	1	.13
Teachers	1	.13
No occupation code	1	.13
Total <i>N</i> of observations	745	

NOTE.—The unit of analysis in this table is individual-year. 249 unique formerly incarcerated individuals found 300 businesses over the years 2000–2015, leading to 745 individual-year observations. The relative frequency across the industry and occupation codes are almost identical when using businesses as unit of analysis (300 observations).

APPENDIX B

Additional Descriptive Statistics on Earnings

Appendix tables B1 and B2 provide the mean and median earnings for both annual and hourly earnings in US dollars, by prior incarceration status, employment/entrepreneurship status, and race. We show that both in terms of annual earnings and hourly earnings, entrepreneurship increases earnings for formerly incarcerated individuals compared to that of paid employment. We show that this is true regardless of whether the business is incorporated or has employees, although we do find greater earnings benefits from entrepreneurs with incorporated businesses or employees.

TABLE B1
ANNUAL AND HOURLY EARNINGS IN US DOLLARS BY INCARCERATION AND ENTREPRENEURSHIP

	NEVER INCARCERATED				FORMERLY INCARCERATED			
	Entrepreneurship				Entrepreneurship			
	Paid Employment	Full	Incorporated or Has Employees	Not Incorporated, No Employees	Paid Employment	Full	Incorporated or Has Employees	Not Incorporated, No Employees
Annual earnings:								
Mean	16,141	17,072	22,940	14,989	12,601	16,397	22,729	13,337
Median	13,800	13,800	20,250	11,850	10,080	13,125	19,595	10,950
Hourly earnings:								
Mean	9.28	1.26	11.80	9.71	7.89	1.58	11.52	1.09
Median	7.90	8.60	1.27	8.17	6.90	9.05	1.38	8.14

TABLE B2
ANNUAL AND HOURLY EARNINGS IN US DOLLARS BY RACE AND ENTREPRENEURSHIP FOR FORMERLY INCARCERATED INDIVIDUALS

	NEVER INCARCERATED				FORMERLY INCARCERATED			
	Entrepreneurship				Entrepreneurship			
	Paid Employment	Full- Time	Incorporated or Has Employees	Not Incorporated, No Employees	Paid Employment	Full- Time	Incorporated or Has Employees	Not Incorporated, No Employees
Black individuals:								
Annual earnings:								
Mean	13,142	13,639	18,219	11,903	8,367	12,477	18,721	10,002
Median	10,560	9,470	16,000	7,200	5,840	7,920	12,313	6,450
Hourly earnings:								
Mean	8.21	9.57	1.62	9.15	6.71	8.38	8.78	8.22
Median	7.14	7.54	8.74	7.31	6.20	6.94	8.09	6.69
White individuals:								
Annual earnings:								
Mean	17,401	18,631	25,711	16,281	15,275	19,591	26,221	15,928
Median	14,940	15,050	22,500	13,160	13,280	16,500	23,360	13,813
Hourly Earnings:								
Mean	9.68	1.55	12.44	9.91	8.63	12.02	13.16	11.38
Median	8.28	9.00	11.25	8.54	7.51	1.80	11.85	1.16

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