Preliminary:
Please do not cite or quote

From Locked Up to Locked Out: Access to Affordable Rental Housing and Criminal Recidivism[1]

Timothy Young[2]

Job Market Candidate
Department of Economics
University of California, Irvine

November 2018

Abstract

Attaining rental housing is difficult for ex-offenders because most landlords are unwilling to rent to them and rents are often unaffordable. This is the first paper to estimate the relationship between affordable rental housing market conditions and the probability that released felons return to prison. I find that ex-offenders who return to areas with relatively higher vacancy rates for affordable rental housing are significantly less likely to recidivate. This finding is driven by blacks and the availability of rental-units in single-family homes, whose landlords are more likely to rent to ex-offenders. I find no effect for changes in the share of affordable units in multi-family buildings, which is consistent with these units often being rented by property management companies who are less likely to rent to ex-offenders. I conclude that accessibility–not just affordability–of rental housing is important for decreasing recidivism of ex-offenders.

JEL Codes: R31, H32, I39
Keywords: Affordable housing, recidivism, economics of crime

[1] This is a working paper–comments are encouraged. I would like to thank Emily Owens, David Neumark, Damon Clark, and the participants of the UC Irvine Applied Micro Workshop for their comments on this paper. I am also grateful for funding from the UC Irvine Summer Fellowship.
[2] E-mail: youngt3@uci.edu Website: www.timothycyoung.com

I. Introduction

In 2015, over 600,000 prisoners were released from state and federal correctional facilities in the United States (Carson and Anderson 2016). The majority of released prisoners will reoffend and be arrested: in 2005, over two-thirds were rearrested and nearly half were returned to prison within three years (Durose, Cooper, and Snyder 2014).[3] Policy experts and ex-offenders frequently report that a lack of accessible and affordable housing is one of the most significant barriers for recently released offenders to successfully reenter society (Fontaine 2013; Fontaine and Biess 2012; Gouvis Roman et al. 2004). In addition to budget and credit limitations, attaining rental housing is difficult for many ex-offenders because of the discrimination[4] they face from landlords (Evans and Porter 2015), especially property management companies[5]. Moreover, black ex-offenders may have relatively more difficulty in attaining housing because even law-abiding blacks face housing market discrimination (Yinger 1986).

There are several reasons why estimating the effect of access and availability of affordable housing on recidivism is challenging. First, an ideal experiment would randomly assign affordable housing to ex-offenders upon release, for example, through random assignment of section 8 housing vouchers.[6] Unfortunately, not only has there been no randomization of vouchers to ex-

[3] These estimates are based on the Bureau of Justice Statistics (BJS)'s most recent report on reentry trends in the U.S. Although I cannot estimate arrest rates among released offenders in my data, the recidivism rates I estimate between 2005 and 2015 are very similar to those published by BJS.

[4] By "discrimination," I mean the differential treatment by landlords of two identical applicants who differ only with respect to their criminal history. The Equal Employment Opportunity Commission discrimination is defined by preference given to an otherwise identically qualified applicant because of race, color, religion, sex, disability, familial status, or national origin however, felons are not a protected class. Therefore, I use the term "discrimination" to describe differential treatment of ex-offenders with the caveat that not renting to ex-offenders is legal and may be rational.

[5] This is based on anecdotal experiences and advice provided to ex-offenders. See footnote 8 for specific examples.

[6] With section 8 vouchers, recipients can use the vouchers to help subsidize or fully cover (depending on income) the cost of renting a unit in public housing, or in a private residence and includes single-family homes, townhomes, and apartments.

offenders, most ex-offenders who qualify[7] never receive section-8 vouchers or access to public housing, because of the discretion exercised by public housing authorities and private landlords (Tran-Leung 2015). Even ex-offenders who receive a voucher may be unable to find housing if the marginal landlord has a sufficient level of prejudice against them (Charles and Guryan 2008).[8] Second, estimating differences in recidivism rates between ex-offenders who succeed and fail to secure housing would produce biased estimates if unobservable characteristics are correlated with one's ability to secure housing and the probability of recidivating. Longitudinally studying recently released offenders for such a study is especially challenging because of the high survey attrition rates among these individuals (Harding et al. 2014; N. La Vigne and Parthasarathy 2005). Several studies evaluate reentry programs that provide housing to recently released felons. However, they either suffer from selection bias (Bae, DiZerega, et al. 2016) or they confound the effect of housing with other wraparound services integrated with the program (Lutze, Rosky, and Hamilton 2014).

I address these challenges by exploiting temporal and locational variation in rental markets to which ex-offenders are released. I use the National Corrections Reporting Program (NCRP), a large administrative dataset on prison admissions and releases, to identify the effect of being released into communities with different costs, availability, and types of rental housing on the probability an ex-offender recidivates. I control for a rich set of offender-level characteristics such as race, age at release, and type of offense. I also control for county-level covariates that could be correlated with local rental market conditions, such as labor market conditions and criminal activity. Using these data, which contain the universe of released offenders from state correctional

[7] Federal mandate only explicitly and permanently prohibits Federally assisted housing programs for ex-offenders convicted of manufacturing methamphetamine on federally assisted property (e.g., public housing), or those who are required to register as sex offenders for life.

[8] Even non-offenders with section 8 vouchers face differential treatment and discrimination from landlords (Beck 1996).

facilities in 23 states from 2005-2014, I examine the relationship between housing and recidivism on a much larger scale than previous studies.

I show that black ex-offenders released into communities with a greater share of affordable vacant rental units in single-family structures are significantly less likely to recidivate, where I define recidivism as returning to prison within one year of release. Specifically, I find that black ex-offenders who return to areas with a one-standard deviation higher share of vacant and affordable single-family rental units have a 1.5 percent lower probability of recidivism. However, I find no evidence that black ex-offenders released to communities with higher shares of affordable and vacant rental units in multi-family structures are less likely to recidivate. This is consistent with reentry advice published in blogs and in guides by non-profits for finding felon-friendly housing that recommends felons submit rental applications for units in single-family buildings rather than multi-family rental units, because the latter are more likely to be managed by a property management group that generally prohibit renting to ex-felons.[9]

This paper contributes to several strands of literature. First, it contributes to recent work examining the relationship between local community conditions that ex-offenders face upon release and the probability that they recidivate. Both Yang (2016) and Schnepel (2017) show that the labor market into which an ex-offender is released is an important predictor of recidivism. Similarly, policies aimed at increasing income or public assistance, such as the Earned Income Tax Credit, minimum wages, or Supplemental Nutrition Assistance Program (SNAP) in the community into which an ex-offender is released also reduces recidivism (Agan and Makowsky 2018; Yang 2017). Increasing income, financial resources, and access to good paying jobs can reduce recidivism because they increase the opportunity cost of illegal behavior. Similarly,

[9] See, for example https://helpforfelons.org/felon-friendly-apartments-housing/ and https://www.forrent.com/blog/tips/renting-apartment-felony-conviction/, both accessed August 31, 2018.

housing for ex-offenders can increase the opportunity cost of illegal behavior, because committing a crime could result in an eviction and loss of housing. Reduced housing costs could also create an income effect, similar in spirit to the income effect from increases in the minimum wage, that lowers the relative payoff from illegal behavior (Agan and Makowsky 2018).

Second, it contributes to the work on discrimination against felons in housing, which is often performed using audit and correspondence studies. My findings are consistent with those of Evans, Blount-Hill, and Cubellis (2018) who find that ex-felons are significantly less likely to be considered as prospective tenants. Specifically, I find that ex-offenders released into areas with less tight rental markets, where landlords may be less likely to discriminate (Hanson and Hawley 2014), are less likely to recidivate.

Last, this paper is related to work on discrimination against blacks in housing, which is often measured using audit and correspondence studies. Hanson and Hawley (2011)'s matched pair audit study finds that blacks face greater discrimination by landlords for units in multi-family buildings however, they do not analyze differences across felony status. My findings tie together these two strands of literature on housing discrimination by examining the effect of housing discrimination at the intersection of race and felony status.[10] I find no evidence that the share of affordable housing affects recidivism rates for white ex-offenders, which is consistent with Hanson and Hawley (2011)'s finding that landlords discriminate less against white applicants.[11]

[10] Using an audit study, Evans, Blount-Hill, and Cubellis (2018) do not find statistical differences in consideration by landlords between black and white testers pretending to be felons, but the study does not have a large enough sample size to detect even moderate differences. The raw differences they report are consistent with landlords exercising greater discrimination against black felons compared to white felons. Moreover, they do not examine differences across units in single- and multi-family housing structures.

[11] An alternative explanation may be that black-white differences in family structure, support, and resources upon release affects one's reliance on the rental market.

The remainder of this paper is organized as follows: Section 2 provides background on the relationship between housing and recidivism, and discusses previous studies that examine the effect of housing provision on recidivism. Section 3 presents the data and the identification strategy. Section 4 presents the model used to estimate the results presented in section 5, and Section 6 concludes.

II. Background

The Link Between Housing Instability and Reoffending

I model an ex-offender's decision to recidivate using a simple Becker (1974) style framework. Ex-offender i will reoffend if $w_i^* < w_i^{crime}$ where w_i^* is the net payoff from legal activity and w_i^{crime} is the expected net payoff from illegal activity. An increase in income or employment increases w_i^*, which decreases the marginal ex-offender's probability of reoffending and recidivism. Similarly, there are several ways in which housing can increase w_i^* and subsequently reduce recidivism.

First, if housing is complementary to finding and maintaining employment, then increasing the likelihood of securing housing would increase w_i^* solely through its effect on employment. Housing is a basic necessity for sleeping comfortably, showering, and storing clean clothes and compromising any of these necessities increases the difficulty of finding and maintaining employment. Without a stable address, ex-offenders face additional hurdles in filling out job applications, even in states that have banned-the-box[12] (Agan and Starr 2016). And, in some cases, employment may be conditional on having a reliably permanent living arrangement (Bradley et al.

[12] Ban-the-box policies make it unlawful for employers to ask job applicants about their criminal history until they make an offer to the applicant. It effectually removes the box on job applications that asks if the applicant has been convicted of a felony.

2001). Programs like "housing first"[13] are designed around the complementarity between housing and achieving other goals correlated with successful reentry, like employment (Fontaine and Biess 2012; Meredith et al. 2003; N. G. La Vigne, Visher, and Castro 2004). In a randomized experiment that allocated "Housing first" accommodations[14] for extremely at-risk homeless individuals, Somers et al. (2013) found that housing first accommodations significantly reduced the number of convictions per person.

Second, returning to an area with lower rental housing costs can have a direct income effect that increases w_i^*. Increased public assistance for ex-offenders and increases in the minimum wage, which increases income for many of the jobs available to low-skilled ex-offenders, have both been shown to reduce recidivism (Agan and Makowsky 2018; Yang 2017). Therefore, ex-offenders returning to areas where housing is less of a financial burden may be less likely to recidivate.

Third, attaining stable housing may increase the non-monetary payoff to legal activity by decreasing the psychological stress associated with residential instability or by enabling ex-offenders to escape risky living environments, especially if these environments contributed to previous offending. Many ex-offenders suffer from mental health and substance abuse issues that require long-term treatment before and after release, and the stress of residential instability can place additional burdens that can compromise these treatments (Bradley et al. 2001).

Barriers to Finding Housing

Ex-offenders face high rates of residential instability following release from a correctional facility. A 2004 report by the Urban Institute that followed 400 male inmates found that 31 percent

[13] "Housing first" policies are human services programs based around the idea that it is necessary to establish stable housing as a foundation before providing any other social services to rehabilitate individuals, such as job finding assistance. The application of these policies is not limited to ex-offenders, but any at-risk group.

[14] Somers et al. (2013) characterize Housing first accommodations as "rapid rehousing in permanent, market accommodations without requirements around sobriety or treatment adherence and facilitating access to specific resources (e.g., health, social, vocational) to support the attainment of client centered goals." (1)

of respondents did not have a place to live upon release (N. G. La Vigne, Visher, and Castro 2004). Three quarters of these individuals said they would need some help or a lot of help finding a housing. Upon release, 60-80 percent of ex-offenders rely on living with parents, family members, or intimate partners (Durose, Cooper, and Snyder 2014; Roman et al. 2006; N. G. La Vigne, Visher, and Castro 2004; N. La Vigne and Parthasarathy 2005).

Two primary barriers make it difficult for ex-offenders to find housing: affordability and discrimination from landlords. Many ex-offenders struggle to find gainful employment, and are financially burdened by debt accrued while incarcerated and with fines associated with their offense that make it challenging to afford housing (Bannon, Nagrecha, and Diller 2010; Beckett and Harris 2011). As discussed above, ex-offenders who are able to find housing that is relatively more affordable may be less likely to recidivate because it would increase w_i^*.

Housing Discrimination Against Ex-Offenders

Discrimination against ex-offenders in housing is not illegal because ex-offenders are not a protected group under the Fair Housing Act.[15] A landlord who is given the choice between renting to one of two tenants who are otherwise identical, except that one is a felon, could rationally choose the non-ex-offender if they have concerns that their other tenants will be uncomfortable living near ex-offenders. This is called "customer discrimination" and is most frequently exercised by landlords of rental units in multi-family structures[16] because of the close proximity of neighbors and potential future tenants who may have a distaste for living near members of an undesirable or minority group, such as blacks or ex-offenders (Yinger 1986).

[15] On April 4, 2016, Housing of Urban Development (HUD) issue guidance to landlords to reduce discrimination against applications with felony convictions. See: https://www.hud.gov/sites/documents/HUD_OGCGUIDAPPFHASTANDCR.PDF accessed September 3, 2018.

[16] Multi-family structures are defined as structures with two or more rental units, like a duplex (two units) or an apartment building (more than two units).

A number of guides written to aid newly released offenders with finding housing suggest that property management companies, as opposed to private landlords, are much more likely to discriminate against ex-offenders. Because most units in multi-family structures are managed by property management companies, ex-offenders are advised to look for units in single-family structures because they are more likely to have individuals as landlords (instead of property management companies) who are more flexible with applicants with criminal convictions.[17] One such guide says "Don't waste your time with Property Management Groups" and to "stay away from large apartment complexes." (Felon Friendly Apartments–Housing For Felons n.d.)

Recent audit studies provide evidence consistent with landlords exercising customer discrimination against minorities. In particular, they find that rental discrimination is highest against blacks for units that are part of a larger building, like an apartment complex (Hanson and Hawley 2011, 2014). They also find that discrimination against blacks is higher in areas with low-vacancy rates, which is consistent with tighter rental markets enabling landlords to discriminate more against minorities. This suggests a pattern of discrimination that may be generalizable to ex-offenders, particularly black ex-offenders.

In addition to customer discrimination, there are other reasons that landlords could refuse to rent to an ex-offender that would not necessarily result in an inefficient allocation of resources. For example, landlords may accurately believe that applicants with felony drug convictions are more likely to use, distribute, or manufacture drugs in their residence and therefore choose not to rent to them. Landlord discrimination becomes inefficient when fully rehabilitated ex-offenders are not given the same consideration as other applicants, everything else held constant, especially

[17] For examples of these guides, see https://helpforfelons.org/felon-friendly-apartments-housing/, https://homeguides.sfgate.com/rental-housing-felony-8428.html, and for a question and answer on the topic from Trulia, see https://www.trulia.com/voices/Property_QandA/i_have_felonies_on_my_record_how_do_i_find_a_place-331961

in single-family housing where customer discrimination should play little or no role in rental decisions.

Local Housing Interventions for Ex-offenders

Several local interventions have included housing provisions for ex-offenders, but none have isolated a treatment effect for housing without wraparound services. The Reentry Housing Pilot Program (RHPP) in Washington state provided housing and wraparound services to 208 high risk/need ex-offenders leaving prison without a place to live. Lutze, Rosky, and Hamilton (2014) estimated the program's effect using propensity score matching and found that participants were 14 percentage points less likely to recidivate. However, this estimated treatment effect does not isolate the impact of housing, because the program also provided targeted treatment services, offender accountability strategies, and coordinated reentry services between law enforcement agencies and corrections departments at each pilot site. Moreover, assignment to the pilot was voluntary and may suffer from sample selection.[18]

Studies published by the Vera Institute of Justice have also focused on housing as part of a successful reentry program, such as their evaluation of New York City Housing Authority's Family Reentry Pilot Program (FRPP) (Bae, et al. 2016). But again, this study fails to isolate the effect of housing from other wrap around services and does not randomize treatment across the participants. Therefore, there have been no local housing interventions that focus solely on the effect of housing on recidivism.

III. Data

[18] If participants positively selected into the program based on unobservable characteristics that were correlated with lower-than-average recidivism rates in the absence of treatment (e.g., they could have been highly motivated to successfully reenter society), then appropriate counterfactuals using propensity score matching using only observed characteristics would result in the program's effect being biased upward. The selection bias could be negative if those with higher-than-average risk of recidivism choose to volunteer for the program, because they think they need more assistance than other ex-offenders.

National Corrections Reporting Program (NCRP)

I measure recidivism using the National Corrections Reporting Program (NCRP)–a large offender-level administrative dataset produced by the Bureau of Justice Statistics (BJS). Until several years ago, the NCRP was cross-sectional, which made it impossible to precisely identify when or if previously released offenders returned to the prison system. Over the past several years, BJS has partnered with ABT Associates to create "term record" files with unique inmate identification numbers. Each term record lists a prisoner's date of admittance, and if applicable, their date of release.[19] Pooling the term records over time creates a panel of prisoner releases for which I can observe[20] recidivism between 2005-2014[21] (Bureau of Justice Statistics, 2016). In addition to having term records for a large number of offenders over time, the NCRP data are well suited to study recidivism because they identify the county where sentences are imposed. This is important because over ninety percent of offenders return to the county where their sentence was imposed (Sabol, Couture, and Harrison 2007; Schnepel 2017; Yang 2016).

I implement several sample restrictions to the raw NCRP data. First, I drop data from California after October 1, 2011 because of the enactment of AB109 and AB117, commonly referred to as realignment. Realignment resulted in non-serious offenders being moved from state prison to local correctional facilities.[22] In the NCRP, offenders who were transferred to local correctional facilities appear in the data as releases, but because they were not in fact being released to the public, the recidivism rate appears significantly lower in California after October 1, 2011.

[19] In my data, some offenders are admitted to but not released from a correctional facility (i.e., they are still incarcerated). For these offenders, their date of release is not populated.
[20] To observe whether an offender recidivates within one year, data on admissions through one-year post release are required. Therefore, even though the NCRP data extend through 2015, I cannot examine 1-year recidivism outcomes for those released in 2015 because I do not observe whether they are reincarcerated in 2016.
[21] The NCRP data is available back to 2000, but I only examine data from 2005-2014 because the ACS only contain county identifiers beginning in 2005.
[22] I retain records from California prior to the enactment of realignment.

Second, I drop counties with fewer than one-hundred releases to eliminate treatments (i.e., counties) with small sample sizes. Third, I drop all releases due to death of the offender. Fourth, I drop all term record files where the county of sentencing identifier is missing, because these are required to link rental market characteristics to released offenders. Appendix Table A1 tabulates the states and years for which data on recidivism rates for released offenders are available in the NCRP from 2005-2014 after imposing these sample restrictions and Appendix Table A2 shows average recidivism rates by state and year.

I define an ex-offender as recidivating within one year of being released if the offender is released from prison at time t and is readmitted to prison at a date on or after their release date,[23] and before time $t + n$ where $n \leq 365$ days. For recidivism within two years, I replace 365 with 730, and for three years, with 1,095.[24] Table 1 Panel 1 shows average one-, two-, and three-year recidivism rates. On average, 29.5 percent of released offenders recidivate within one year, 40.9 percent within two years, and 46.6 percent within three years. The probability that an offender recidivates is highest when first released and steadily declines over time (see Figure 1).

In addition to tracking each inmate's date of release and admission to prison within a state over time, the NCRP also contains rich sentencing, offense, and demographic data. I use admission and release date to calculate the amount of time the offender actually serves before being released and include this as a control in the models I estimate. I also define controls for the type of facility an offender is released from. The majority of released are from prison (87 percent) and about 4 percent are from local jails.

[23] In some cases, a release date for a prisoner's term will be the same as the admittance date for the prisoner's subsequent term. This almost always occurs when the date of release and admittance are coded as the "15th" of the month, so I interpret these as imprecise, possibly imputed, dates. I code such instances as a recidivism.

[24] As a result of how recidivism is defined, an additional year of data on releases from the end of each state's sample is lost for every additional year added to the recidivism window.

The top three offenses carrying the longest sentences are provided for all 2,131,127 term records. There are 165 different categories of offenses in the NCRP. Because some offense categories have very few observations, I generate dummy variables for each inmate's most serious offense[25] by aggregating offenses to six broad categories: violent, property crime, drug possession, drug trafficking, sexual, and other. These six variables fully classify each inmate's offense for all of the 165 original offense categories. Coding offenses in this way is also useful for performing offense heterogeneity analyses. The modal offense is property, which constitutes 36.7 percent of offenders, followed by drug trafficking (12.8) and drug possession offenders (12.8).

Offender-level demographic data in the NCRP includes date of birth (which I use to calculate age at release), race, education, Hispanic ethnicity, and sex (see Table 1). I create dummy variables for the following races: white, black, Asian, and other. The highest degree achieved by an inmate is available for 1,198,124 term records, which constitutes about half the sample. Because education is missing frequently, I do not include it as a control in my main specifications, but I do show that my main estimates are robust to including it (Appendix Table A3).

I limit the main estimation sample to complete cases by dropping observations with missing data on controls (except education). In my final sample, I have 2,131,127 term records for which recidivism within one-year can be estimated.

American Community Survey (ACS)

I use the American Community Survey (ACS)[26] from 2005-2014 primarly for two main categories of county-by-year level variables: rental market indicators and labor market conditions. For all ACS variables, I calculate the mean by county and year before combining this data with the NCRP.

[25] An inmate's most serious offense is defined as the offense for which he or she is serving the longest sentence.
[26] ACS data was accessed and downloaded through IPUMS (Ruggles et al. 2017).

Rental market indicators

I generate rental market indicators–the regressors of interest–for different types of rental units and the share of units that are affordable and vacant (i.e., currently available for rent). Average monthly rent is measured in the ACS by responses to "What is the monthly rent for this house, apartment, or mobile home?" I estimate average inflation adjusted county-level rent for all units and for all vacant units that are "for rent or for sale."[27] The ACS also asks respondents "Which best describes this building?" I identify rental units in single-family structures when the response is either "A one-family house detached from any other house", "A one-family house attached to one or more houses," or "Mobile home or trailer." I identify units in multi-family structures when the building has two or more units (e.g., 2+ family building).

I calculate the share of affordable rental units as follows:

$$ShareAffordable_{ict} = \frac{N_{ict} \mid P^{rent} < 0.35 * MedianIncome_{ct}}{N_{ict}} \quad (1)$$

Where N_{ict} is the number of rental units in county c and year t and i is the type of structure (single-family, multi-family, or either). The numerator is the number of rental units with rent below 35 percent of median income, which I define as the threshold of affordability. This is five-percentage points higher than the Housing and Urban Development (HUD) definition of "affordable", because HUD's definition includes utilities in the price of rent.[28] While the ACS does provide a measure of rent that includes utilities, it does not provide one for vacant rental units.

[27] Ideally, I want to examine only units available for rent, but the ACS does not separate units for rent and those for sale.

[28] HUD defines affordable housing as "In general, housing for which the occupant(s) is/are paying no more than 30 percent of his or her income for gross housing costs, including utilities." https://www.huduser.gov/portal/glossary/glossary_a.html Accessed August 27, 2018. Because the rental cost for vacant units in the ACS does not include utilities, I add 5 percent to HUD's baseline definition of affordability.

Therefore, to be consistent in the rental price measures I use for vacant and occupied units, I use the rental measure that excludes utility costs.

The calculation of affordable housing defined in equation (1) does not account for the vacancy status (i.e., whether a unit is available for rent) of each affordable unit. The vacancy status of an affordable unit is important because ex-offenders who return to an area with a high rate of affordable housing may still be unable to find housing if the market is sufficiently tight. Therefore, I calculate the share of affordable and vacant units:

$$ShareAffordableVacant_{ict} = \frac{N_{ict} \mid P^{rent} < 0.35 * MedianIncome_{ct} \,\&\, vacant}{N_{ict}} \quad (2)$$

The only difference between equation (1) and equation (2) is that the latter restricts the number of affordable units in the numerator to be vacant units. I also use equation (2) to define shares of vacant affordable rental housing separately for single-family and multi-family rental units. This indicator captures rental market tightness for affordable units. The share of affordable vacant rental units is about 4 percent (Table 1 Panel 2). It is lowest for single-family units (2 percent), and highest for multi-family units (4.8 percent), which is consistent with the distribution of rent for vacant single-family units being to the right of the distribution of rent for multi-family units (Appendix Figure 2).

Labor Market Controls

To help disentangle the simultaneity between rental markets and labor markets, I include labor market controls from the ACS for the four industries most likely to hire ex-offenders (the estimated share of firms within each industry that hire ex-offenders as reported in Lichtenberger (2006) are in parentheses): manufacturing (21.66%), construction (19.89%), food service (16.62%), and administrative and support services (14.28%). For each industry i, I calculate the share of employed workers who report working in industry i, the unemployment rate for workers

who report working in industry i, and the inflation-adjusted monthly income of workers employed in industry i.[29] Table 1 Panel 2 presents summary statistics for these labor market controls. All four industries combined account for over 20 percent of the overall labor force. Unemployment rates within each industry vary from a low of 5.7 percent in administrative jobs to a high of 12.2 in construction.[30] Average income also differs substantially across the four industries. Workers in the food service industry earn about $1,100 a month, which is less than half of average earnings in the other three industries. The highest income is reported by those in administrative work who earn $2,474 per month on average.

IV. Identification and Methodology

I estimate the relationship between the rental market into which an offender is released and the probability the offender returns to prison by estimating the following model by least squares:

$$Recidivate_{jct} = \alpha + \beta RentalMarketMeasure_{ct} + \delta X_{jct} + \gamma W_{c,t} + \kappa_c + \psi_t + e_{jct} \qquad (3)$$

The left-hand side of (3) is an indicator equal to one if offender j, who is released from a correctional facility in county c in year t reenters prison within one year. The variable $RentalMarketMeasure_{ct}$ represents a range of different rental market indicators that are included in separate estimations of equation (3). It takes on continuous values of either rent, share of affordable rental units (see equation (1)), or the share of vacant and affordable rental units (see equation (2)). The coefficient of interest is β. It is interpreted as the percentage point difference in the expected probability that an offender will return to prison given a one-unit change in $RentalMarketMeasure$. When $RentalMarketMeasure$ is defined by equation (1) or (2), I

[29] I determine industry using the variable "occ2010," which harmonizes the coding of occupations using the Census Bureau's 2010 ACS occupational classification.

[30] The high unemployment rate for the construction industry is not surprising considering the sample includes the Great Recession.

interpret β as the expected change in recidivism for a one-standard deviation change in $RentalMarketMeasure$, because of the differences in moments across measures.[31]

The vector X_{jct} contains offender-level demographic data from the NCRP and includes race, an indicator for Hispanic ethnicity, sex, age at release, type of facility the offender is released from, time served during most recent prison spell prior to release, and dummy variables for the most serious offense of conviction. While X varies at the individual level, the ct subscripts are necessary because repeat offenders who appear multiple times in the data have individual characteristics that are not fixed over time, such as the age at release, offense of conviction, and time served during most recent prison spell. The vector $W_{c,t}$ contains county-by-year varying controls from the ACS, including the labor market controls described in Section III, logged counts of total part-I offenses, violent offenses, and property offenses from the Federal Bureau of Investigation's (FBI) Uniform Crime Report (UCR), and logged total sworn law enforcement officers from the FBI's Law Enforcement Officers Killed in Action (LEOKA) data (Table 1 Panel 3). Finally, κ_c and ψ_t are county- and year-fixed effects, respectively.

Two identifying assumptions are necessary for interpreting β as the causal effect of $RentalMarketMeasure$ on the probability a released offender recidivates. First, there must be no reverse causality between recidivism and $RentalMarketMeasure$. This assumption would be violated if, for example, parole boards select offenders to be released because of contemporaneous rental market conditions. This would however, require parole boards to have data on rental market conditions when they decide whether to release an offender, which is unlikely given the lags in

[31] For example, when $RentalMarketMeasure$ is the share of affordable rental units, interpreting β based on a five-percentage point change $RentalMarketMeasure$ implies a $0.05 * \beta$-percent change in recidivism given a 7.26% (0.05/0.689) change in the share of affordable rental units. However, when $RentalMarketMeasure$ is the share of affordable vacant rental units, a five-percentage point change $RentalMarketMeasure$ implies a $0.05 * \beta$-percent change in recidivism given a 125% (0.05/0.04) change in the share of affordable rental units.

publishing the rental market indicators used in this study. Some parole boards require that ex-offenders have housing accommodations in place prior to release–because this would increase the share of ex-offenders with housing upon release, it would attenuate estimates of β.

Second, e_{jct} must be uncorrelated with $RentalMarketMeasure$. That is, estimates of β would be inconsistent if $RentalMarketMeasure$ is correlated with unobservable county-by-time varying characteristics that are also correlated with recidivism. For example, ex-offenders released into counties with higher than average rent may have lower rates of recidivism if high rent areas are correlated with higher quantities of social services and other local amenities that attract residents and increase rental market demand, but also reduce recidivism. A priori, β should be biased downwards because rents are likely to be positively related to local amenities that are correlated with reduced recidivism. An exception is if higher rent areas provide more valuable opportunities for offenders, especially property offenders (Freedman and Owens 2016). I test this exception later by restricting the sample to released offenders convicted of property crimes and find no evidence of this (see Table 9).

Because offender-level housing data do not exist, I rely on county-level rental market indicators. But, these data introduce potential measurement error issues. For example, average county rents may poorly capture rental market conditions faced by individuals seeking rental housing, because the cost of units currently available for rent may not be the same as what the average renter occupying a unit currently pays. Average rent for vacant units is about 5 percent higher than all vacant and occupied units (Table 1) and the distributions are rather similar (Appendix Figure 1).

While rent for vacant units may more accurately measure the market faced by the average renter, it may be less accurate for ex-offenders–especially black ex-offenders–who face greater

discrimination by landlords. This may especially be true in tight rental markets characterized by low vacancy rates (Hanson and Hawley 2014).

Because of the potential measurement issues inherent in analyzing rental prices, I instead focus much of my analysis on identifying the effect of being released into areas with different shares of rental units that are available and affordable, as defined in equation (2).

There may still be bias in estimating β if affordable housing market tightness is correlated with e_i, however, a priori, we would expect a decrease in market tightness (i.e., an increase in the share of vacant and affordable units relative to all units) to reflect a decline in neighborhood quality that would be positively correlated with recidivism. Importantly, this measure is likely better at capturing the ease with which ex-offenders, who have lower than average income, are exposed to rental units within their budget. Analyzing differences between units in single-family structures and multi-family structures should even more accurately reflect the share of units accessible to ex-offenders, because of the differences in landlord discrimination across these different types of units described in Section II. Comparing these two types of units boosts the causal interpretation if unobservable confounding trends are similar across the two types of structures.

V. Results

Below, I present the empirical results. I begin with the main results on the relationship between rental market measures and recidivism. In the second part, I show how the main results vary heterogeneously across offender characteristics, including sentence length, education, and offense type. In the last section, I present results from robustness tests.

Main Results

Estimates of the relationship between various measures of average rent and recidivism rates conditional on county and year fixed effects are presented in the first column of Table 2. The

estimates of the relationship between average county rent and recidivism in Panel 1 are noisy, but are consistent with ex-offenders who return to areas with higher than average rents having a lower rate of recidivism. The direction of this effect is consistent omitted variables bias. That is, these estimates suggest a positive correlation between average rent and unobservable characteristics that are negatively correlated with recidivism, such as social services, community services, and public assistance. Limiting rents to those for vacant units (Panel 2) substantially reduces the size of the coefficient. Panels 3 and 4 further limit rent to vacant units in single-family structures and multi-family structures, respectively. While the coefficients are small and not statistically significant, there is a positive relationship between recidivating and being released to a county with relatively higher rent for single-family vacant units. The estimates for multi-family rents are roughly half the size as those for single-family. The heterogeneity of these different types of rental units suggests that examining rental housing most relevant and accessible to ex-offenders may overcome some of the measurement error inherent in using broad rental market indicators that may be correlated with other unobservables.

The measurement error associated with overall rents suggested from Table 2 is echoed in Table 3, which presents estimates of the relationship between the share of affordable rental units (including both vacant and occupied) and recidivism. Ex-offenders who return to counties with a one-standard deviation higher share of affordable rental units have a 6.5-7.3[32] percent higher rate of recidivism, depending on the controls included in the model. The magnitude is largest for blacks (8.0-8.5 percent), and lowest for whites (4.5–5.2 percent) and is precisely estimated at the 1 to 5 percent level. This measure broadly captures the affordability of rental housing but does not accurately capture *availability* of affordable housing, since most of these rental units are occupied.

[32] I calculate the percent change in the outcome, Y, associated with one-standard deviation change in the variable of interest as $(SD * \beta)/\bar{Y}$. Standard deviations are listed in next to the title for each panel.

The direction and precision of the estimates suggests that returning to areas with a larger share of affordable housing increases the likelihood of recidivating. However, this specification is likely capturing the relationship between high shares of inexpensive housing and poverty, as opposed to the effect of higher shares of affordable housing on recidivism.

In Table 4, I replicate the estimates in Table 3, but replace the numerator with the number of affordable and *vacant* rental units, instead of total affordable units. The denominator is the number of rental units, which is the same that was used in Table 3. Focusing on the vacancy status of affordable units results in estimates that become negative and remain similar in absolute magnitude to the estimates in Table 3. The direction of the estimates is consistent with ex-offenders who return to areas with a higher share of affordable vacant units for rent being less likely to recidivate, but the estimates are imprecise. The differences in the estimates between Tables 3 and 4 clearly suggests that vacancy status of rental units is an important consideration. Because of this, I focus my analysis on the share of affordable and vacant rental units.

Table 5 presents estimates from the preferred specification. In this Table, I re-estimate the model in Table 4, but now focus on the share of affordable rental units in single-family structures.[33] As discussed previously, a significant body of anecdotal evidence suggests that landlords who are the most willing to rent to ex-offenders are landlords of single-family structures. For the overall sample, ex-offenders released to areas with a one-standard deviation higher share of affordable vacant units for rent in structures with only a single-family unit are 0.9 to 1.0 percent less likely to recidivate. This is significant at the five-percent level. The estimates for blacks in Panel 2 are about 1.5 times as large (1.4 to 1.5 percent, per one-standard deviation increase) as the full sample and are statistically significant at the five-percent level regardless of what controls are included. The

[33] In Appendix Table A4, I replicate the estimates in Table 5, but include the share of affordable vacant multi-family units as a control. The estimates are nearly identical.

effects are much smaller (about a tenth of the magnitude) and statistically insignificant for whites in Panel 3, which suggests important racial differences in how rental housing markets affect recidivism.

Unlike with units in single-family structures, I show in Table 6 that ex-offenders who return to areas with lower vacancy rates for affordable units in multi-family structures are not statistically significantly less likely to recidivate. The direction is the same as in Table 5 but the magnitudes are about half those of single-family rental units (0.5 to 0.8 percent compared to 1.4 to 1.5 percent). This is consistent with these types of housing units being much less accessible to ex-offenders, especially black ex-offenders, and therefore changes in their availability are not significantly associated with changes in recidivism. The differences in estimates between these two different types of units boosts the casual interpretation of estimates in Table 5 if local area trends correlated with both rental markets and recidivism are parallel for single and multi-family housing.

Next, in Figure 2, I examine how the affordability of units affects recidivism by redefining affordability for each decile of median income. Each point in Figure 2 is an estimate of β from a separate regression of equation (3) where $RentalMarketMeasure$ is replaced with:

$$ShareAffordableVacantPct_{xy} = \frac{N_{ct}|\ vacant}{N_{ct}}|\ (x < P^{rent} \leq Y)$$

Where $x \in [0,90]$ and $y \in [10,100]$ and corresponds to each decile of median income and is calculated for single-family rental units. Therefore, $ShareAffordableVacantPct_{0\ 10}$ is the share of vacant single-family rental units with rent between zero and ten percent of median county income divided by the number of single-family rental units with rent at the same decile. For blacks, the expected change in recidivism from an increase in the share of vacant single-family rental units is largest for rents priced below 40 percent of median income. The magnitudes of the estimates are very close to zero and always statistically insignificant for rents above 40 percent of median

income, which suggests higher shares of vacant units are not enough to reduce recidivism–the units must also be affordable. The estimates on recidivism whites differ little, which is consistent with this group's risk of recidivism being relatively unaffected by the share of affordable single-family units.

Heterogeneity

In Figure 3, I examine in more detail the effects of changes in the share of vacant and affordable rental units across different types of structures. The first three structure types listed beginning with "1-fam" fully constitute what I define as single-family structures, and the remaining six structure types beginning with "multi-fam" fully constitute what I define as multi-family housing (the number in parentheses refers to the number of units per structure). These nine classifications are as detailed as the ACS permits. It is striking that the only large and statistically significant effect on recidivism occurs for changes in the share of vacant and affordable housing for detached single-family units. The estimates for attached single-family units are very close to zero. Only finding an effect among detached single-family homes, but not attached single-family homes, which have close proximity neighbors, is highly suggestive that customer discrimination against black ex-offenders plays an important role in their access to rental housing and consequently the probability they recidivate.

Next, I examine differences in responses by sentence length. Time spent incarcerated may erode social connections that are beneficial for helping ex-offenders find housing. Ex-offenders who spend relatively more time away from their community may have fewer social connections available that can assist them with housing, and thus these individuals may have to rely more on local rental markets to find a place to live. Additionally, landlords may discriminate against ex-offenders who served longer sentences because they perceive the offense committed as being more

severe. Indeed, a positive correlation between offense severity and sentence served may reflect other undesirable characteristics that enter a landlords' decision. On the other hand, landlords may believe that ex-offenders who served longer sentences are more likely to be fully rehabilitated and less likely to reoffend than those who served shorter sentences.[34] In Table 7, I estimate the model used in Table 5, but fully interact all covariates with an indicator for whether the ex-offender's most recent sentence was less than one-year, or one-year or more. The coefficient on the interaction term is positive, suggesting that rental markets affect recidivism less for ex-offenders with sentences longer than one year however, the difference is not statistically significant.

Because differences in ex-offender's educational attainment may reflect differences in their post-release family resources, it may also be correlated with their ability to find work and housing. Those with more education may be less affected by the affordability and availability of local housing if their family or personal resources make it easier for them to find rental housing. Additionally, education is positively related to how one speaks, writes, and presents themselves, which has been shown to reduce differences in housing discrimination between blacks and whites (Hanson and Hawley 2011). In Table 8, I estimate the same model in Table 5 and fully interact all covariates with an indicator for whether the ex-offender is a high school graduate. The coefficient on the interaction term is positive, suggesting higher education attenuates some of the effects of rental housing markets on recidivism, but the standard errors are too large to statistically infer any differences.

Next, I examine whether the effect of housing on w_i^* from Section II differs by offense type. For example, ex-offenders who committed financially motivated crimes, like property offenders, may be more sensitive to increases in w_i^* from reductions in relative rental costs. Table

[34] Indeed, the mean recidivism rates in Table 8 show that ex-offenders who serve one-year or more are about half as likely to recidivate as those who serve less than one-year.

9 presents estimates of the relationship between the share of affordable vacant single-family housing and recidivism by offense. Recidivism rates for ex-offenders convicted of property crimes are the most impacted by rental housing markets. Black offenders released into neighborhoods with one-standard deviation higher share of affordable vacant single-family units are 2.8 percent less likely to recidivate. This effect is highly statistically significant (over four standard deviations). The estimates for black violent offenders, and those convicted of other offenses[35] are also large, 2.4 percent and 1.4 percent respectively. Estimates for drug offenders (both possession and trafficking), and sex offenders are smaller and statistically insignificant. This is not surprising, since being convicted of either of these offenses can result in a lifetime ban to accessing public housing, and recent experimental work shows that drug and sex offenders (especially black drug offenders[36]) receive extremely low consideration from landlords (Evans, Blount-Hill, and Cubellis 2018).[37] Landlords may be especially hesitant to rent to ex-drug-offenders because a rental unit provides a location from which drug distribution and manufacturing can take place. On the contrary, rental units are less likely to enter the production function for property and violent crimes.

Robustness

I perform a number of robustness checks to confirm the validity of the estimates in Table 5. First, in Table 10, I include Census region-by-year fixed effects to account for annual regional shocks that could be correlated with rental markets and recidivism.[38] It is important to note that when region-by-year are included, identification is based only on within-region variation in county

[35] "Other offenses" consist of all offenses other than violent, property, drug, and sex offenses.
[36] The difference in call back rates for black and white drug offenders was 1five-percentage points, but was not statistically significant because of a low-powered sample.
[37] Unfortunately, this paper does not examine landlord consideration of other types of offenders like violent or property.
[38] There are nine Census regions for the continental U.S., and I include a Census region indicator for Alaska (Hawaii is not in the data).

rents, which may not necessarily be better variation if, for instance, a better counterfactual for rents in Seattle is rents in San Francisco versus Spokane, Washington. Nonetheless, the effect for blacks (Panel 2) is robust; a one-standard deviation increase in the share of vacant affordable single-family units is associated with a reduction in recidivism of about 1.0 percent.

Alternatively, I could more flexibly control for confounding shocks at the state and year level by including state-by-year fixed effects instead of region-by-year fixed effects. I show the results for this in Appendix Table A5. The estimates for the share of single-vacant affordable single-family units are qualitatively similar. The relative reduction in variance by using state-by-year instead of region-by-year fixed however, is low. Region-by-year fixed effects explain 65 and 80 percent of the variation in the share of vacant single- and multi-family units, respectively. State-by-year fixed effects explain only slightly more variation: 70 and 82 percent, respectively.

In Table 11, I estimate the same models as Table 5 but include county-by-year linear time trends. These county-by-year linear time trends account for any linear trends in unobservables over time that could be correlated with local rental markets and recidivism. The estimates fall in magnitude and precision when county-by-year linear trends are included. However, these trends may simply account for much of the variation of interest (i.e., natural variation in rental markets), instead of simply capturing linear trends in county-level unobservables over time. Moreover, when attempting to control for unobserved trends, it is impossible to determine the correct functional form of the unobservables for which one is trying to control.

Another potential concern is that racial differences between ex-offenders are correlated with the probability an offender leaves their county of release in a way that biases the estimates. For example, if whites are more likely to leave their county of release and move to a county with better affordable housing options then this would attenuate the estimates and explain the null

effects I find for white offenders. If mobility across groups varies significantly, then the treatment would be inaccurately assigned differentially across groups. In Table 12 I test for potential mobility across observables by comparing rates of recidivism for offenders by whether they reoffend in the same county into which they were released. For the full sample of reoffenders, over 95 percent who reoffend do so in their county of release. This differs very little by race, or any other observable dimension. This is strongly suggestive that mobility across counties is uncorrelated with observable characteristics, at least for those who reoffend.

The means in Table 12 however, do not test whether the treatment is associated with the probability that an ex-offender stays or leaves the county into which they are released. Ex-offenders released into counties with less favorable housing markets may be more likely to leave an area if they have difficulty finding housing. To test this, I regress an indicator for reoffending in the same county as release on the same covariates used in Table 5, conditional on ex-offenders who reoffend. Table 13 shows that there is no statistically significant evidence of a relationship between the share of affordable vacant single-family units and the probability that recidivism occurs in a different county from the county of release. The coefficient is relatively small for blacks. The probability that an ex-offender released to a county with a higher share of vacant affordable rental units is statistically more likely to recidivate in the same county of release. However, the effect is relatively small–only about 0.3 percent per one-standard deviation change. This suggests that ex-offenders who return to areas with a lower share of vacant affordable rental units are more likely to move and reoffend in a different county. If offenders released into worse rental markets are moving to better rental markets, then this implies that my estimates in Table 5 are lower bounds.

In Table 14, I also find that the results are similar when expanding the window of recidivism to two-years, although they become less precise. In the second panel of Table 14, I show that part of the decline in magnitude is due to using the limited sample for which I can identify recidivism within two years. In Panel 3 I examine recidivism within three-years and the estimates become small and statistically insignificant. A potential explanation for this result is reversion to the mean in rental markets if the shocks that resulted in higher than average shares of affordable vacant single-family rental housing subside within three years. Consider treated compliers who in the absence of available housing would have recidivated in the first year of release. If vacancy rates are sufficiently volatile that they change substantially within 3 years, then treated compliers who lose their housing may face a worse rental market than they faced when they were released. Therefore, including recidivism outcomes in the third year would attenuate the estimates if rental markets are sufficiently dynamic.

In Table 15, I exclude female felons, who make up about ten-percent of the full sample. I do this because some evidence suggests female felons experience different levels of discrimination in the rental market compared with men (Evans, Blount-Hill, and Cubellis 2018; Ondrich et al. 1999), and because of differences in post release programs available to them. The results are practically unchanged from those in Table 5 when female felons are omitted from the analysis.

VI. Conclusion

In this paper, I examine how the rental market into which an offender is released is related to their probability of recidivism. In particular, using data from the NCRP and the ACS, I compare variation in recidivism rates to average rent, rent for vacant units, shares of vacant units, and shares of affordable vacant units. My main findings indicate that black ex-offenders are significantly less likely to recidivate when they return to areas with a higher share of affordable and available units

in single-family homes. This result is consistent with advice provided to recently released offenders looking for housing that landlords of single-family homes are more willing to rent to ex-offenders. Moreover, the effect is concentrated among non-drug and non-sex offenders. This is consistent with experimental evidence that these two types of offenders receive very low consideration from landlords (Evans, Blount-Hill, and Cubellis 2018). Further, I show evidence that the effect is driven by detached single-family units and not attached single-family units, which provides evidence that customer discrimination plays an important role in the relationship between housing and recidivism.

One of the mechanisms through which housing can affect recidivism is through its complementary effect on employment and wages. It is difficult for ex-offenders to find employment, but even more so without a stable address. Landlords are often unwilling to rent to unemployed applicants and, for many, being able to afford rent is impossible without first securing employment. Therefore, it is natural to compare my findings to those on the effect of labor market policies or public assistance on recidivism. My finding that a one-standard deviation increase in the share of vacant and affordable housing reduces recidivism for blacks by 1.4-1.5 percent is slightly lower than the labor market and public assistance effects estimated in other studies. Yang (2016) finds that the typical growth in wages that occurs over a business cycle can reduce the probability of recidivism within 1-year by 2.3-4.0 percent and Agan and Makowsky (2018) find that an average increase in the minimum wage reduces recidivism by 2.8 percent. All of these estimates are lower than Yang (2017)'s finding that eligibility for public assistance (welfare and food stamps) reduces recidivism by as much as 10 percent. However, it should be noted that my estimates are most likely lower bounds, considering shocks that increase the share of affordable vacant housing may be correlated with other factors that decrease the probability of successful

reentry. More research is required to better understand the complementary effects of securing housing and labor market success on recidivism.

The primary policy implication of this paper is to highlight the importance of accessible and affordable housing in helping ex-offenders successfully reenter society. For decades, policy makers at federal and local levels have enacted programs designed to increase the stock of affordable housing and lower rental prices, like the Low-Income Housing Tax Credit (LIHTC), and rent control. Unfortunately, there is little evidence that these interventions increase the stock of low-income housing (Freedman and Owens 2011), and even if they did, ex-offenders, in particular black ex-offenders, may still be unable to find landlords willing to rent to them, especially when development is focused on apartment buildings instead of single-family homes. That is, my findings suggest that ex-offenders need more than just affordable housing–they need *accessible* housing.

Ban-the-box policies in housing, which make it illegal for employers to screen applicants by felony status, may be an attractive solution to decrease discrimination against black ex-offenders. Most ban-the-box policies address behavior of employers, but policy makers are beginning to ban-the-box in housing as well. In late 2016, Richmond, CA enacted an ordinance that prevents providers of public or subsidized housing from inquiring about criminal history.[39] However, ban-the-box policies, which decrease the information otherwise available to landlords, may result in statistical discrimination against applicants who they perceive as having a higher probability of being an ex-offender, notably blacks (Agan and Starr 2016). Instead, a better policy may be to simply ensure that landlords, and especially property management companies, do not impose blanket bans on ex-offenders.

[39] See https://www.ci.richmond.ca.us/ArchiveCenter/ViewFile/Item/7690 (accessed September 26, 2018)

References

Agan, Amanda Y, and Michael D Makowsky. 2018. "The Minimum Wage, EITC , and Criminal Recidivism." *Working paper*: 1–48.

Agan, Amanda Y, and Sonja B Starr. 2016. *Ban the Box, Criminal Records, and Statistical Discrimination: A Field Experiment*. http://ssrn.com/abstract=2795795 (March 21, 2017).

Bae, John, Margaret DiZerega, et al. 2016. *122 Coming Home*. New York. https://storage.googleapis.com/vera-web-assets/downloads/Publications/coming-home-nycha-family-reentry-pilot-program-evaluation/legacy_downloads/NYCHA_report-032917.pdf (March 15, 2018).

Bae, John, Margaret Dizerega, et al. 2016. *An Evaluation of the New York City Housing Authority's Family Reentry Pilot Program*. https://storage.googleapis.com/vera-web-assets/downloads/Publications/coming-home-nycha-family-reentry-pilot-program-evaluation/legacy_downloads/NYCHA_report-032917.pdf (August 31, 2018).

Bannon, Alicia, Mitali Nagrecha, and Rebekah Diller. 2010. *Criminal Justice Debt: A Barrier to Reentry*.

Beck, Paula. 1996. "Fighting Section 8 Discrimination: The Fair Housing Act's New Frontier." *Harvard Civil Rights-Civil Liberties Law Review* 31: 155–86.

Becker, Gary S. 1974. Essays in the Economics of Crime and Punishment *Crime and Punishment: An Economic Approach*. http://www.nber.org/books/beck74-1 (March 19, 2017).

Beckett, Katherine, and Alexes Harris. 2011. "On Cash and Conviction." *Criminology & Public Policy* 10(3): 509–37. https://vpn.uci.edu/+CSCO+0075676763663A2F2F62617976617279766F656E656C2E6A7679726C2E70627A++/doi/pdf/10.1111/j.1745-9133.2011.00726.x (September 3, 2018).

Bradley, Katharine H., R.B Micahel Oliver, Noel C. Richardson, and Elspeth M. Slayter. 2001. "No Place Like Home: Housing and the Ex-Prisoner." *Community Resources for Justice*. https://www.researchgate.net/profile/Elspeth_Slayter/publication/239616156_No_Place_Like_Home_Housing_and_the_Ex-Prisoner/links/53dfbfaf0cf27a7b8306a7fb/No-Place-Like-Home-Housing-and-the-Ex-Prisoner.pdf (March 22, 2018).

Carson, Ann E., and Elizabeth Anderson. 2016. "Prisoners in 2015." *U.S. Department of Justice, Bureau of Justice Statistics*: 33. https://www.bjs.gov/content/pub/pdf/p15.pdf (February 8, 2018).

Charles, Kerwin Kofi, and Jonathan Guryan. 2008. 116 Journal of Political Economy *Prejudice and Wages: An Empirical Assessment of Becker's The Economics of Discrimination*. http://econ2.econ.iastate.edu/classes/econ321/orazem/Charles_GuryanPrejudiceWages.pdf (September 3, 2018).

Durose, Matthew R, Alexia D Cooper, and Howard N Snyder. 2014. "Recidivism of Prisoners Released in 30 States in 2005 : Patterns from 2005 to 2010." *U.S. Department of Justice* Special Re(April): 1–31. https://www.bjs.gov/content/pub/pdf/rprts05p0510.pdf (October 1, 2018).

Evans, Douglas N, Kwan-Lamar Blount-Hill, and Michelle A Cubellis. 2018. "Housing Studies Examining Housing Discrimination across Race, Gender and Felony History Examining Housing Discrimination across Race, Gender and Felony History." *Housing Studies*. http://www.tandfonline.com/action/journalInformation?journalCode=chos20 (August 31, 2018).

Evans, Douglas N, and Jeremy R Porter. 2015. "Criminal History and Landlord Rental Decisions: A New York Quasi-Experimental Study." *Journal of Experimental Criminology* 11(1): 21–42. https://link.springer.com/content/pdf/10.1007%2Fs11292-014-9217-4.pdf (February 7, 2018).

"Felon Friendly Apartments - Housing For Felons." https://helpforfelons.org/felon-friendly-apartments-housing/ (September 3, 2018).

Fontaine, Jocelyn. 2013. *Examining Housing as a Pathway to Successful Reentry: A Demonstration Design Process*. https://www.urban.org/sites/default/files/publication/24206/412957-Examining-Housing-as-a-Pathway-to-Successful-Reentry-A-Demonstration-Design-Process.PDF (January 8, 2018).

Fontaine, Jocelyn, and Jennifer Biess. 2012. *Housing as a Platform for Improving Outcomes for Older Renters*. https://www.urban.org/sites/default/files/publication/25321/412552-Housing-as-a-Platform-for-Formerly-Incarcerated-Persons.PDF (January 8, 2018).

Freedman, Matthew, and Emily G Owens. 2011. "Low-Income Housing Development and Crime." *Journal of Urban Economics* 70: 115–31. https://ac.els-cdn.com/S0094119011000301/1-s2.0-S0094119011000301-main.pdf?_tid=6fdbd2e6-f00d-11e7-885f-00000aab0f6c&acdnat=1514932796_f1133bd13ba0aa3226aec9c048a0b058 (January 2, 2018).

———. 2016. "Your Friends and Neighbors: Localized Economic Development and Criminal Activity." *The Review of Economics and Statistics* 98(2): 233–53. http://www.mitpress (September 4, 2018).

Gouvis Roman, Caterina et al. 2004. *Taking Stock: Housing, Homelessness, and Prisoner Reentry*. http://webarchive.urban.org/UploadedPDF/411096_taking_stock.pdf (December 13, 2017).

Hanson, Andrew, and Zackary Hawley. 2011. "Do Landlords Discriminate in the Rental Housing Market? Evidence from an Internet Field Experiment in US Cities." *Journal of Urban Economics* 70(2–3): 99–114. https://www.sciencedirect.com/science/article/pii/S0094119011000179?via%3Dihub (August 24, 2018).

———. 2014. "Where Does Racial Discrimination Occur? An Experimental Analysis across Neighborhood and Housing Unit Characteristics." *Regional Science and Urban Economics* 44: 94–106. https://www.sciencedirect.com/science/article/pii/S0166046213001105 (August 24, 2018).

Harding, David J, Jessica J.B. Wyse, Cheyney Dobson, and Jeffrey D Morenoff. 2014. "Making Ends Meet After Prison." *Journal of Policy Analysis and Management* 33(2): 440–70. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4288962/pdf/nihms626952.pdf (February 13, 2018).

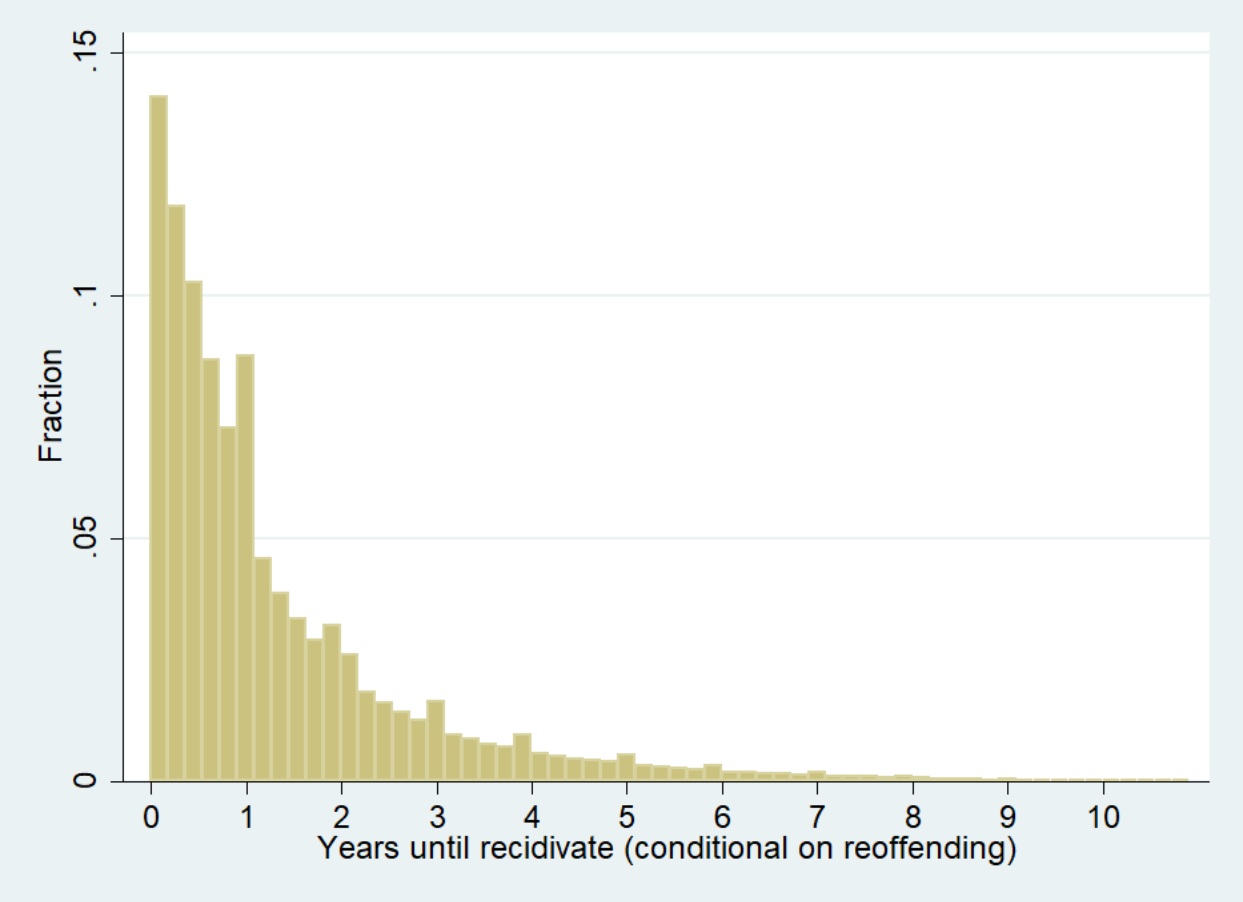
Lichtenberger, Eric. 2006. "Where Do Ex-Offenders Find Jobs? An Industrial Profile of Ex-Offenders in Virginia." *Correctional Education Association* 57(4): 297–311. http://www.jstor.org/stable/23282804 (March 15, 2018).

Lutze, Faith E, Jeffrey W Rosky, and Zachary K Hamilton. 2014. "Homelessness and Reentry: A Multisite Outcome Evaluation of Washington State's Reentry Housing Program for High Risk Offenders." *Criminal Justice and Behavior* 41(4): 471–91. http://journals.sagepub.com/doi/pdf/10.1177/0093854813510164 (February 8, 2018).

Meredith, Tammy, John Speir, Sharon Johnson, and Heather Hull. 2003. *Enhancing Parole Decision-Making through the Automation of Risk Assessment*. Atlanta, GA.

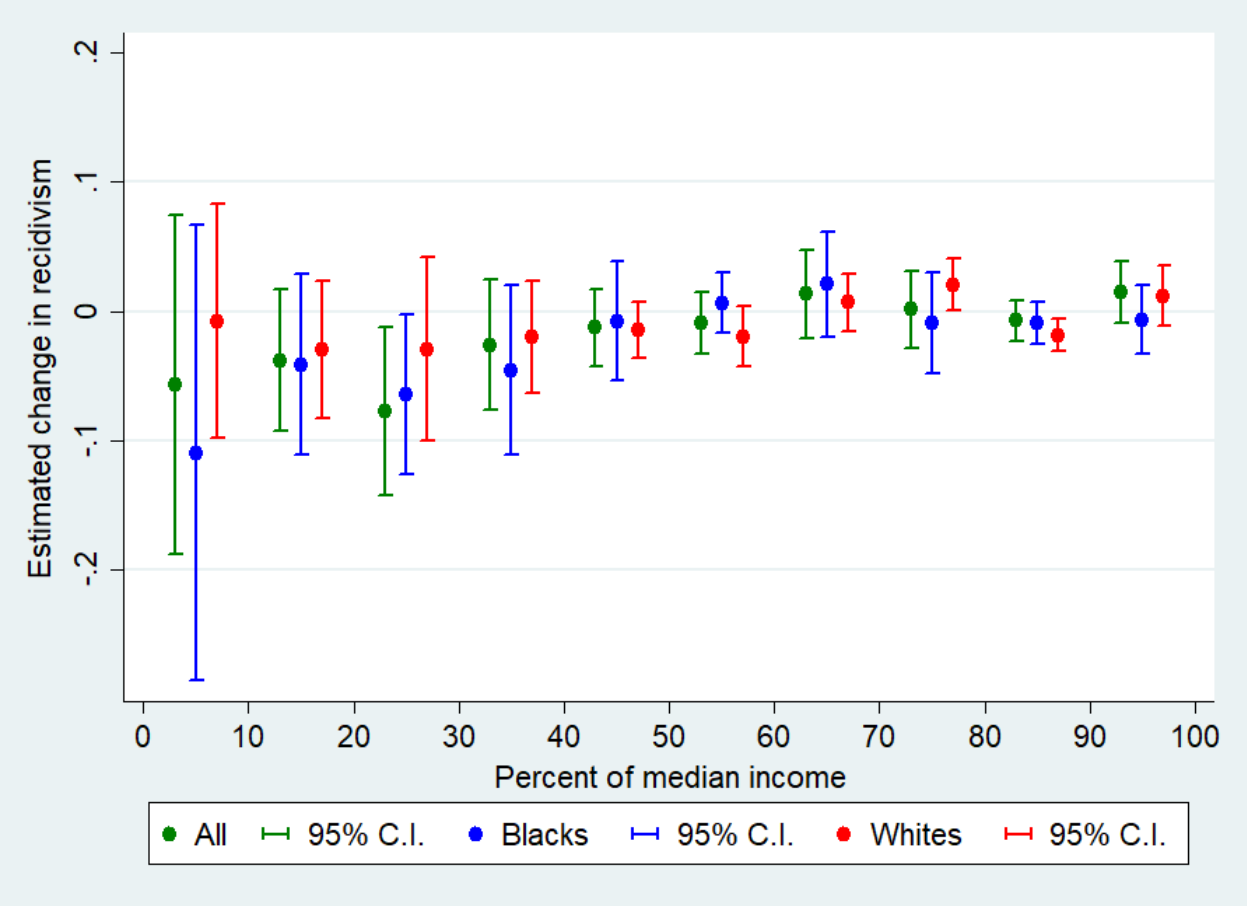
of Justice. Office of Justice Programs. Bureau of Justice Statistics, United States Department. 2016. “National Corrections Reporting Program, 2000-2013: Selected Variables.”
Ondrich, Jan, Alex Stricker, Fannie Mae, and John Yinger. 1999. 8 Journal of Housing Economics *Do Landlords Discriminate? The Incidence and Causes of Racial Discrimination in Rental Housing Markets*. http://www.idealibrary.comon (August 31, 2018).
Roman, Caterina Gouvis, Michael J Kane, Rukmini Giridharadas, and Michael J Kane. 2006. *The Housing Landscape for Returning Prisoners in the District of Columbia*. https://www.urban.org/sites/default/files/publication/46396/411433-The-Housing-Landscape-for-Returning-Prisoners-in-the-District.PDF (February 13, 2018).
Ruggles, Steven et al. 2017. “Integrated Public Use Microdata Series: Version 7.0[Dataset].” *Minneapolis: University of Minnesota*. https://doi.org/10.18128/D010.V7.0.
Sabol, William J, Heather Couture, and Paige M Harrison. 2007. *Prisoners in 2006*. US Department of Justice, Bureau of Justice Statistics Washington, DC.
Schnepel, Kevin T. 2017. “Good Jobs and Recidivism.” *Economic Journal* 128(608): 447–69. http://doi.wiley.com/10.1111/ecoj.12415 (February 8, 2018).
Somers, Julian M et al. 2013. “Housing First Reduces Re-Offending among Formerly Homeless Adults with Mental Disorders: Results of a Randomized Controlled Trial.” *PloS One* 8(9): e72946. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3762899/pdf/pone.0072946.pdf (December 13, 2017).
Tran-Leung, Marie Claire. 2015. “When Discretion Means Denial: A National Perspective on Criminal Records Barriers to Federally Subsidized Housing.” (February). http://ezproxy.lib.umb.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1045865&site=ehost-live%0Ahttp://www.caddogap.com/periodicals.shtml.
La Vigne, Nancy G., Chirsty Visher, and Jennifer Castro. 2004. *Chicago Prisoners’ Experiences Returning Home*. https://www.urban.org/sites/default/files/publication/42831/311115-Chicago-Prisoners-Experiences-Returning-Home.PDF (February 9, 2018).
La Vigne, Nancy, and Barbara Parthasarathy. 2005. “Prisoner Reentry And\rResidential Mobility.” *Urban Institute Justice Policy Center*: 1–6. http://justice.urban.org (February 13, 2018).
Yang, Crystal S. 2016. “Local Labor Markets and Criminal Recidivism.” *Journal of Public Economics* 147: 16–29. http://ac.els-cdn.com/S0047272716302067/1-s2.0-S0047272716302067-main.pdf?_tid=979ba4da-56cc-11e7-b89f-00000aacb35d&acdnat=1498082417_fcf119e34ac2a9f7835e00e62bc6a700 (June 21, 2017).
———. 2017. “Does Public Assistance Reduce Recidivism?” In *American Economic Review: Papers & Proceedings*, , 551–55. https://doi.org/10.1257/aer.p20171001 (November 29, 2017).
Yinger, John. 1986. 76 Source: The American Economic Review *American Economic Association Measuring Racial Discrimination with Fair Housing Audits: Caught in the Act*. https://www.jstor.org/stable/pdf/1816458.pdf (September 5, 2018).

Figure 1. Number of years until released offenders are readmitted to prison, conditional on recidivating, 2005-2015



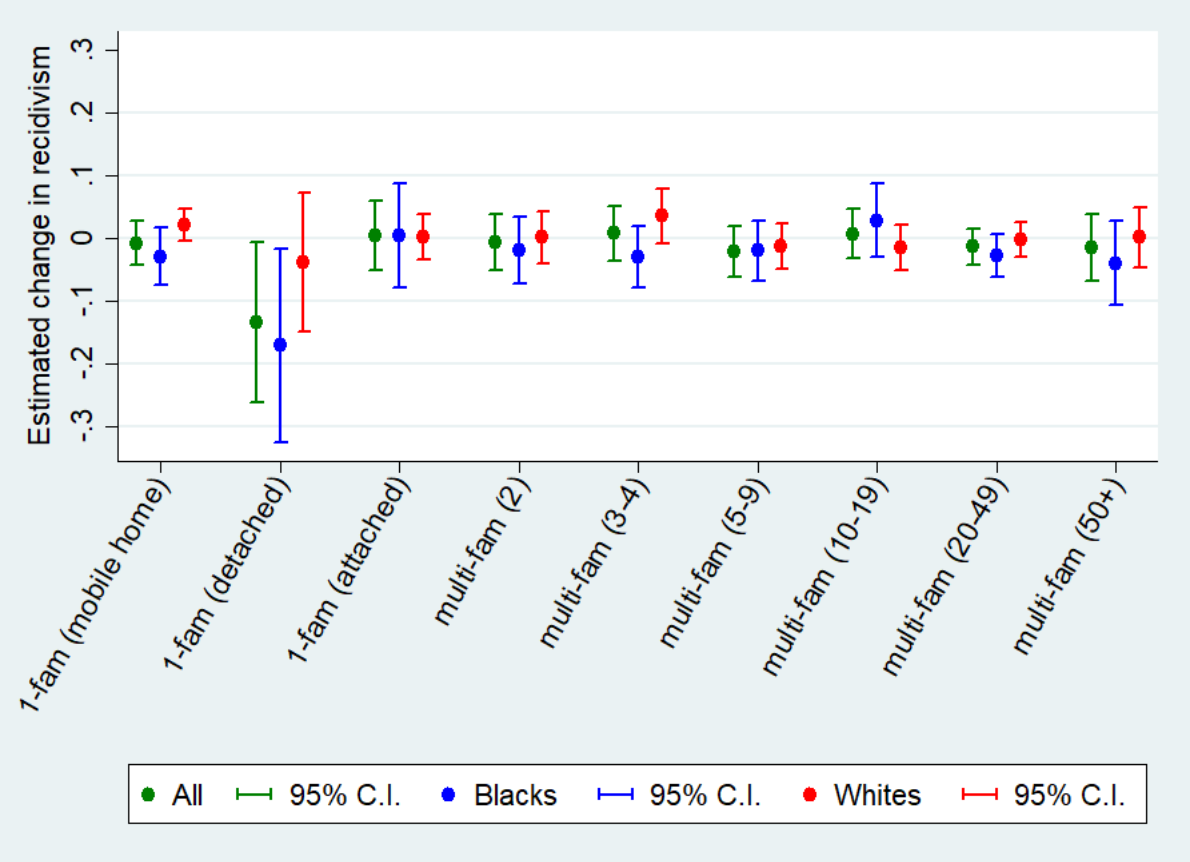
Note: Data from are from the 2005-2015 National Corrections Reporting Program.

Figure 2. Heterogeneous relationship between the share of single-family rental housing that is vacant and 1-year recidivism, by units with rent in each decile of median income



Note: Each estimate is from a separate regression of equation 3 that replaces the share of housing below 35 percent of median income with the share of affordable single-family housing that is vacant with rent within each decile of county-by-year median income. Each model includes all controls, county fixed effects, year fixed effects, and standard errors clustered at the county level.

Figure 3. Estimates of the share of rental housing that is vacant and affordable by structure type



Note: Each estimate is from a separate regression of equation (3) with all controls, county fixed effects, year fixed effects, and standard errors clustered at the county level.

Table 1. Summary Statistics (2005-2014)

	N	Mean	Standard deviation
Panel I: Offender-level variables (National Corrections Reporting Program)			
Offense, recidivating, and sentencing variables			
Recidivism within 1 year	2,131,127	0.295	0.456
Recidivism within 2 years	1,893,330	0.409	0.492
Recidivism within 3 years	1,623,238	0.466	0.499
Actual length of sentence served	2,131,127	1.57	2.71
Release from state prison	2,131,127	0.869	0.337
Release from local jail	2,131,127	0.039	0.193
Release from other	2,131,127	0.067	0.250
Release from halfway house	2,131,127	0.010	0.100
Release from work release center	2,131,127	0.0065	0.081
Release from pre-release center	2,131,127	0.0088	0.093
Release from federal prison	2,131,127	0.000064	0.0080
Violent offense	2,131,127	0.106	0.308
Property offense	2,131,127	0.366	0.482
Drug trafficking offense	2,131,127	0.128	0.335
Drug possession offense	2,131,127	0.128	0.333
Sexual offense	2,131,127	0.035	0.184
Other offense	2,131,127	0.237	0.425
Demographic variables			
Male	2,131,127	0.885	0.319
Age at release	2,131,127	36.08	10.47
Hispanic	2,131,127	0.286	0.452
White	2,131,127	0.372	0.483
Black	2,131,127	0.448	0.497
Asian	2,131,127	0.0044	0.066
Another race	2,131,127	0.175	0.380
Less than high school	1,198,124	0.092	0.289
Some high school	1,198,124	0.388	0.487
High school graduate	1,198,124	0.437	0.496
College	1,198,124	0.083	0.276
Panel II: Explanatory variables (American Community Survey)			
County-level rental market conditions			
Rent ($)	2,131,127	661.9	182.2
Rent for vacant units ($)	2,131,127	693.2	228.7
Rent for vacant single-family units ($)	2,018,952	814.5	318.4
Rent for vacant multi-family units ($)	2,124,112	662.6	217.1
Total rental units	2,131,127	3,007	3,869
Total affordable rental units	2,131,127	1,752	1,829
Share of affordable rental units	2,131,127	0.689	0.176
Total affordable vacant rental units	2,131,127	95.98	116.3
Share of affordable vacant rental units	2,131,127	0.040	0.026
Total single-family rental units	2,131,127	806.2	1,077
Total vacant affordable single-family rental units	2,131,127	11.95	13.74
Share of affordable vacant single-family rental units	2,131,127	0.020	0.018

Total multi-family rental units	2,131,127	2,200	2,873
Total affordable vacant multi-family rental units	2,131,127	82.37	104.0
Share of affordable vacant multi-family rental units	2,131,127	0.048	0.032
County-level labor market conditions			
Manufacturing: Share of labor force	2,131,127	0.058	0.023
Manufacturing: Unemployment rate	2,131,127	0.090	0.047
Manufacturing: Average monthly income ($)	2,131,127	2,148	391.9
Administrative: Share of labor force	2,131,127	0.035	0.0066
Administrative: Unemployment rate	2,131,127	0.057	0.036
Administrative: Average monthly income ($)	2,131,127	2,474	388.0
Food-service: Share of labor force	2,131,127	0.053	0.013
Food-service: Unemployment rate	2,131,127	0.104	0.045
Food-service: Average monthly income ($)	2,131,127	1,092	204.7
Construction: Share of labor force	2,131,127	0.057	0.019
Construction: Unemployment rate	2,131,127	0.122	0.068
Construction: Average wage ($)	2,131,127	2,326	482.3
Panel III: County-level variables (FBI Uniform Crime Report)			
Logged total part-I arrests	2,131,127	8.89	1.25
Logged part-I violent arrests	2,131,127	7.65	1.43
Logged part-I property arrests	2,131,127	8.49	1.21
Logged total law enforcement officers	2,131,127	7.90	1.47

Note: Each observation is a "term-record," which is an offender's spell spent incarcerated. The sample is conditional on offenders who are released during the sample. If the same offender returns to prison after being released then that offender will have another "term-record." The sample only includes offenders for whom data on correctional admissions in the same state as the offender's release is available for at least one year following the date of release (or two and three years for recidivism within two to three years respectively). This results in (r+1) observations for each offender, where r is the number of times the offender recidivates. See section 3 for a detailed description of how each variable is constructed. There are 248 unique counties in the full sample.

Table 2. Estimates of the relationship between rental costs and 1-year recidivism

	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Average county rent						
Outcome: 1-year recidivism	-0.0123	-0.0155	-0.0152	-0.0160	-0.0151	-0.0152
	(0.0109)	(0.0107)	(0.0103)	(0.0101)	(0.0104)	(0.0103)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
Panel 2: Average county rent for vacant units						
Outcome: 1-year recidivism	0.00149	0.00131	0.00125	0.00115	0.00146	0.00156
	(0.00108)	(0.00113)	(0.00111)	(0.00110)	(0.00107)	(0.00106)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
Panel 3: Average county rent for single-family vacant units						
Outcome: 1-year recidivism	0.000816	0.000573	0.000664	0.000644	0.000684	0.000599
	(0.000649)	(0.000668)	(0.000657)	(0.000655)	(0.000646)	(0.000657)
Mean 1-year recidivism rate	0.298	0.298	0.298	0.298	0.298	0.298
N	2,018,952	2,018,952	2,018,952	2,018,952	2,018,952	2,018,952
Panel 3: Average county rent for multi-family vacant units						
Outcome: 1-year recidivism	0.000512	0.000216	0.0000972	0.0000295	0.000168	0.000314
	(0.000838)	(0.000856)	(0.000819)	(0.000809)	(0.000802)	(0.000780)
Mean 1-year recidivism rate	0.256	0.272	0.273	0.273	0.273	0.296
N	2,124,112	2,124,112	2,124,112	2,124,112	2,124,112	2,124,112
County & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Offender demographic controls	No	Yes	Yes	Yes	Yes	Yes
Sentencing controls	No	No	Yes	Yes	Yes	Yes
Offense controls	No	No	No	Yes	Yes	Yes
County labor market controls	No	No	No	No	Yes	Yes
County crime controls	No	No	No	No	No	Yes

Note: The outcome is whether a released felon returns to prison (in the same state as release) within 1-year. Each cell is an estimate from a different linear probability model. Offender demographic controls include age at release, sex, race, ethnicity (Hispanic), and education. The rental variables of interest are in $100s of dollars. Sentencing controls include the spell length of the offender's most recent incarceration and facility from which the prisoner was released (state prison, halfway-house, work release, etc). Offense controls include dummy variables for the most serious offense for which the released prisoner was most recently incarcerated. County-level labor market controls include wage, employment, and share of labor force in the following industries most likely to employ ex-offenders: manufacturing, transportation, food service, and construction. County-level crime controls are logged counts of total arrests, arrests for property crime, arrests for violent crime, and total number of police officers. Standard errors are clustered at the county level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3. Estimates of the relationship between share of affordable rental units and 1-year recidivism

	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Share of affordable rental units (SD = 0.176)						
Outcome: 1-year recidivism	0.109**	0.118***	0.122***	0.123***	0.123***	0.121***
	(0.0455)	(0.0445)	(0.0430)	(0.0423)	(0.0411)	(0.0395)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
Panel 2: Share affordable of rental units, black offender sample (SD = 0.158)						
Outcome: 1-year recidivism	0.151**	0.149**	0.142**	0.141**	0.148**	0.145**
	(0.0693)	(0.0693)	(0.0649)	(0.0635)	(0.0629)	(0.0610)
Mean 1-year recidivism rate	0.280	0.280	0.280	0.280	0.280	0.280
N	955,307	955,307	955,307	955,307	955,307	955,307
Panel 3: Share of affordable rental units, white offender sample (SD = 0.173)						
Outcome: 1-year recidivism	0.0729**	0.0753**	0.0850***	0.0864***	0.0786***	0.0765**
	(0.0290)	(0.0296)	(0.0297)	(0.0297)	(0.0294)	(0.0296)
Mean 1-year recidivism rate	0.283	0.283	0.283	0.283	0.283	0.283
N	793,806	793,806	793,806	793,806	793,806	793,806
County & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Offender demographic controls	No	Yes	Yes	Yes	Yes	Yes
Sentencing controls	No	No	Yes	Yes	Yes	Yes
Offense controls	No	No	No	Yes	Yes	Yes
County labor market controls	No	No	No	No	Yes	Yes
County crime controls	No	No	No	No	No	Yes

Note: See notes to Table 2. The share of affordable rental units is the number of units with rent less than 35 percent of median county income divided by the total number of rental units.

Table 4. Estimates of the relationship between share of affordable vacant rental units and 1-year recidivism

	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Share of vacant affordable rental units (SD = 0.0263)						
Outcome: 1-year recidivism	-0.0916	-0.0689	-0.0586	-0.0595	-0.0660	-0.0904
	(0.101)	(0.109)	(0.112)	(0.112)	(0.0107)	(0.106)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
Panel 2: Share of vacant affordable rental units, black offender sample (SD = 0.0272)						
Outcome: 1-year recidivism	-0.143	-0.143	-0.131	-0.129	-0.130	-0.161
	(0.112)	(0.108)	(0.105)	(0.103)	(0.101)	(0.103)
Mean 1-year recidivism rate	0.280	0.280	0.280	0.280	0.280	0.280
N	955,307	955,307	955,307	955,307	955,307	955,307
Panel 3: Share of vacant affordable rental units, white offender sample (SD = 0.0251)						
Outcome: 1-year recidivism	-0.00205	0.0126	0.00530	0.00119	-0.0101	-0.0226
	(0.0931)	(0.0954)	(0.0952)	(0.0960)	(0.0943)	(0.0957)
Mean 1-year recidivism rate	0.283	0.283	0.283	0.283	0.283	0.283
N	793,806	793,806	793,806	793,806	793,806	793,806
County & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Offender demographic controls	No	Yes	Yes	Yes	Yes	Yes
Sentencing controls	No	No	Yes	Yes	Yes	Yes
Offense controls	No	No	No	Yes	Yes	Yes
County labor market controls	No	No	No	No	Yes	Yes
County crime controls	No	No	No	No	No	Yes

Note: See notes to Table 2. The share of affordable vacant rental units is the number of units that are available for rent with rent less than 35 percent of median county income divided by the total number of rental units available for rent.

Table 5. Estimates of the relationship between share of affordable and vacant single- and multi-family rental units and 1-year recidivism

	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Share of affordable vacant single-family rental units (SD = 0.0182)						
Outcome: 1-year recidivism	-0.153**	-0.148*	-0.146*	-0.147*	-0.157**	-0.154**
	(0.0725)	(0.0757)	(0.0758)	(0.0760)	(0.0773)	(0.0762)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
Panel 2: Share of affordable vacant single-family rental units, black offender sample (SD = 0.0196)						
Outcome: 1-year recidivism	-0.221**	-0.221**	-0.212**	-0.207**	-0.212**	-0.211**
	(0.0884)	(0.0881)	(0.0868)	(0.0860)	(0.0891)	(0.0868)
Mean 1-year recidivism rate	0.280	0.280	0.280	0.280	0.280	0.280
N	955,307	955,307	955,307	955,307	955,307	955,307
Panel 3: Share of affordable vacant single-family rental units, white offender sample (SD = 0.0179)						
Outcome: 1-year recidivism	-0.00775	-0.00273	-0.0115	-0.0183	-0.0289	-0.0299
	(0.730)	(0.0732)	(0.0734)	(0.0733)	(0.0722)	(0.0715)
Mean 1-year recidivism rate	0.283	0.283	0.283	0.283	0.283	0.283
N	793,806	793,806	793,806	793,806	793,806	793,806
County & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Offender demographic controls	No	Yes	Yes	Yes	Yes	Yes
Sentencing controls	No	No	Yes	Yes	Yes	Yes
Offense controls	No	No	No	Yes	Yes	Yes
County labor market controls	No	No	No	No	Yes	Yes
County crime controls	No	No	No	No	No	Yes

Note: See notes to Table 2. The share of affordable vacant single-family rental units is the number of units that are available for rent in buildings with only one unit with rent less than 35 percent of median county income divided by the total number of rental units available for rent in buildings with only one unit.

Table 6. Estimates of the relationship between share of affordable vacant multi-family rental units and 1-year recidivism

	(1)	(2)	(3)	(4)	(5)	(6)
Panel 1: Share of affordable vacant multi-family rental units (SD = 0.0323)						
Outcome: 1-year recidivism	-0.0545	-0.0355	-0.0281	-0.0281	-0.0315	-0.0482
	(0.0688)	(0.0736)	(0.0754)	(0.0753)	(0.0711)	(0.0677)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
Panel 2: Share of affordable vacant multi-family rental units, black offender sample (SD = 0.0331)						
Outcome: 1-year recidivism	-0.0562	-0.0555	-0.0471	-0.0463	-0.0507	-0.0721
	(0.0739)	(0.0713)	(0.0693)	(0.0683)	(0.0643)	(0.0621)
Mean 1-year recidivism rate	0.280	0.280	0.280	0.280	0.280	0.280
N	955,307	955,307	955,307	955,307	955,307	955,307
Panel 3: Share of affordable vacant multi-family rental units, white offender sample (SD = 0.0315)						
Outcome: 1-year recidivism	-0.0318	-0.0194	-0.0221	-0.0235	-0.0264	-0.0332
	(0.0632)	(0.0644)	(0.0642)	(0.0649)	(0.0642)	(0.0640)
Mean 1-year recidivism rate	0.283	0.283	0.283	0.283	0.283	0.283
N	793,806	793,806	793,806	793,806	793,806	793,806
County & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Offender demographic controls	No	Yes	Yes	Yes	Yes	Yes
Sentencing controls	No	No	Yes	Yes	Yes	Yes
Offense controls	No	No	No	Yes	Yes	Yes
County labor market controls	No	No	No	No	Yes	Yes
County crime controls	No	No	No	No	No	Yes

Note: See notes to Table 2. The share of affordable vacant multi-family rental units is the number of units that are available for rent in buildings with two or more units with rent less than 35 percent of median county income divided by the total number of rental units available for rent in buildings with two or more units.

Table 7. Comparing estimates of the relationship between share of affordable vacant single-family rental units and 1-year recidivism for ex-offenders by sentence length

	All	Blacks	Whites
Share of affordable vacant single-family units	-0.200**	-0.257**	-0.0720
	(0.0885)	(0.104)	(0.0807)
Sentence is 1-year or more	-0.00867	-0.359	0.0432
	(0.199)	(0.270)	(0.162)
Share of affordable vacant single-family units * Sentence is 1-year or more	0.113	0.138	0.082
	(0.0698)	(0.091)	(0.0787)
Standard deviation of share of affordable vacant single-family units	0.0182	0.0196	0.0179
Mean recidivism rate for sentence less than 1-year sample	0.295	0.280	0.283
N	2,131,127	955,307	793,806
County & year fixed effects	Yes	Yes	Yes
Offender demographic controls	Yes	Yes	Yes
Sentencing controls	Yes	Yes	Yes
Offense controls	Yes	Yes	Yes
County labor market controls	Yes	Yes	Yes
County crime controls	Yes	Yes	Yes

Note: See notes to Table 5. All covariates are fully interacted with an indicator variable equal to one if the ex-offenders most recent incarceration spell was one year or more, and zero otherwise.

Table 8. Estimates of the relationship between share of affordable vacant single-family rental units and 1-year recidivism for ex-offenders by education

	All	Blacks	Whites
Share of affordable vacant single-family units	-0.0650	-0.179**	0.0435
	(0.0641)	(0.0843)	(0.0901)
High school graduate or more	-0.245	-0.289	-0.299
	(0.154)	(0.189)	(0.224)
Share of affordable vacant single-family units * High school graduate or more	0.0647	0.0235	0.0636
	(0.0786)	(0.0872)	(0.0965)
Standard deviation of share of affordable vacant single-family units	0.0182	0.0196	0.0179
Mean recidivism rate for low education sample	0.219	0.232	0.208
N	1,198,124	612,796	476,946
County & year fixed effects	Yes	Yes	Yes
Offender demographic controls	Yes	Yes	Yes
Sentencing controls	Yes	Yes	Yes
Offense controls	Yes	Yes	Yes
County labor market controls	Yes	Yes	Yes
County crime controls	Yes	Yes	Yes

Note: See notes to Table 5.

Table 9. Estimates of the relationship between share of affordable vacant single-family rental units and 1-year recidivism for ex-offenders by offense type

	All	Blacks	Whites
Panel 1: Violent offenders			
Outcome: 1-year recidivism	-0.271***	-0.286**	0.0395
	(0.103)	(0.126)	(0.142)
Standard deviation of share of affordable vacant single-family units	0.0183	0.0211	0.0173
Mean recidivism rate	0.287	0.251	0.278
N	226,008	93,432	77,859
Panel 2: Property offenders			
Outcome: 1-year recidivism	-0.281***	-0.421***	-0.0924
	(0.0918)	(0.0978)	(0.0832)
Standard deviation of share of affordable vacant single-family units	0.0184	0.0199	0.0179
Mean recidivism rate	0.329	0.301	0.322
N	779,933	336,987	310,678
Panel 3: Drug possession offenders			
Outcome: 1-year recidivism	0.00295	0.0415	-0.0847
	(0.104)	(0.124)	(0.152)
Standard deviation of share of affordable vacant single-family units	0.0178	0.0178	0.0173
Mean recidivism rate	0.266	0.226	0.274
N	272,000	136,677	103,515
Panel 4: Drug trafficking offenders			
Outcome: 1-year recidivism	-0.153	-0.116	-0.0352
	(0.122)	(0.153)	(0.154)
Standard deviation of share of affordable vacant single-family units	0.0179	0.0193	0.0173
Mean recidivism rate	0.274	0.280	0.259
N	273,639	157,852	68,271
Panel 5: Sex offenders			
Outcome: 1-year recidivism	0.200	0.405*	0.0633
	(0.135)	(0.231)	(0.162)
Standard deviation of share of affordable vacant single-family units	0.0192	0.0207	0.0194
Mean recidivism rate	0.269	0.322	0.229
N	74,682	25,547	35,940
Panel 6: Other offenders			
Outcome: 1-year recidivism	-0.106	-0.221**	0.0404
	(0.0970)	(0.105)	(0.109)
Standard deviation of share of affordable vacant single-family units	0.0176	0.0189	0.0181
Mean recidivism rate	0.279	0.290	0.247
N	504,865	204,812	197,543
County & year fixed effects	Yes	Yes	Yes
Offender demographic controls	Yes	Yes	Yes
Sentencing controls	Yes	Yes	Yes
Offense controls	Yes	Yes	Yes
County labor market controls	Yes	Yes	Yes
County crime controls	Yes	Yes	Yes

Note: See notes to Table 5.

Table 10. Estimates of the relationship between share of affordable vacant rental units and 1-year recidivism including region-by-year fixed effects

	All	Blacks	Whites
Panel 1: Share of vacant affordable units			
Outcome: 1-year recidivism	-0.0146	-0.152	-0.102
	(0.0803)	(0.0966)	(0.0792)
Standard deviation of share of vacant affordable units	0.0263	0.0272	0.0251
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806
Panel 2: Share of vacant affordable single-family units			
Outcome: 1-year recidivism	-0.0626	-0.144**	0.0464
	(0.0550)	(0.0643)	(0.0628)
Standard deviation of share of vacant affordable single-family units	0.0182	0.0196	0.0179
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806
Panel 3: Share of vacant affordable multi-family units			
Outcome: 1-year recidivism	-0.00856	-0.0685	0.0436
	(0.0512)	(0.0648)	(0.0504)
Standard deviation of share of vacant affordable multi-family units	0.0323	0.0331	0.0315
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806

Note: See notes to Table 5.

Table 11. Estimates of the relationship between share of affordable vacant rental units and 1-year recidivism including county-by-year linear time trends

	All	Blacks	Whites
Panel 1: Share of vacant affordable units			
Outcome: 1-year recidivism	-0.0492	-0.0658	-0.0389
	(0.0554)	(0.0780)	(0.0389)
Standard deviation of share of vacant affordable units	0.0263	0.0272	0.0251
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806
Panel 2: Share of vacant affordable single-family units			
Outcome: 1-year recidivism	-0.00386	-0.0134	0.0304
	(0.0419)	(0.0496)	(0.0616)
Standard deviation of share of vacant affordable single-family units	0.0182	0.0196	0.0179
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806
Panel 3: Share of vacant affordable multi-family units			
Outcome: 1-year recidivism	-0.0479	-0.0458	-0.0649
	(0.0357)	(0.0522)	(0.0419)
Standard deviation of share of vacant affordable multi-family units	0.0323	0.0331	0.0315
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806

Note: See notes to Table 5.

Table 12. Percent of Released Prisoners who Reoffend in the Same County of Sentencing

	Reoffend in Same County		Reoffend in Different County	
	Count	Percent	Count	Percent
All	602,091	95.96	25,381	4.04
Black	256,558	96.26	9,974	3.74
White	211,403	94.46	12,393	5.54
Last sentence served < 1 year	453,332	96.18	17,989	3.82
Last sentence served > 1 year	148,759	95.27	7,392	4.73
Violent offenders	62,862	97.16	1,838	2.84
Property offenders	243,547	95.34	11,899	4.66
Drug possession offenders	68,726	95.30	3,387	4.70
Drug trafficking offenders	72,985	97.51	1,862	2.49
Other offenders	134,460	95.78	5,924	4.22
Sex offenders	19,511	97.64	471	2.36
Males	548,363	95.96	23,080	4.04

Note: Sample consists only of released felons who reoffend between 2005–2014 in the NCRP.

Table 13. Estimates of the relationship between the share of affordable vacant rental units and the probability that recidivism occurs in same county as release

	All	Blacks	Whites
Panel 1: Share of vacant affordable units			
Outcome: Reoffend in same county	0.133**	0.111**	0.131
	(0.0513)	(0.0550)	(0.0851)
Standard deviation of share of vacant affordable units	0.0235	0.0252	0.0300
Mean rate for reoffending in same county	0.960	0.963	0.945
N	627,474	266,532	223,795
Panel 2: Share of vacant affordable single-family units			
Outcome: Reoffend in same county	0.0695	0.0328	0.107
	(0.0510)	(0.0577)	(0.0726)
Standard deviation of share of vacant affordable single-family units	0.0156	0.0172	0.0159
Mean rate for reoffending in same county	0.960	0.963	0.945
N	627,474	266,532	223,795
Panel 3: Share of vacant affordable multi-family units			
Outcome: Reoffend in same county	0.0604*	0.0456	0.0332
	(0.0356)	(0.0436)	(0.0561)
Standard deviation of share of vacant affordable multi-family units	0.0285	0.0299	0.0286
Mean rate for reoffending in same county	0.960	0.963	0.945
N	627,474	266,532	223,795

Note: The sample consists of ex-offenders who ever recidivate in the data. The outcome is whether an offender is sentenced to a correctional facility in the same county as release.

Table 14. Estimates of the relationship between share of affordable vacant single-family rental units and recidivism within 2- and 3-years

	All	Blacks	Whites
Panel 1: Share of affordable vacant single-family rental units and recidivism within 2-years			
Outcome: 2-year recidivism	-0.0831	-0.111	0.0208
	(0.0791)	(0.0915)	(0.0738)
Standard deviation of share of vacant affordable single-family units	0.0185	0.0199	0.0182
Mean 2-year recidivism rate	0.409	0.406	0.390
N	1,893,330	867,534	701,481
Panel 2: Share of affordable vacant single-family rental units (Panel 1 sample)			
Outcome: 1-year recidivism	-0.0904	-0.153**	0.0376
	(0.0585)	(0.0717)	(0.0668)
Standard deviation of share of vacant affordable single-family units	0.0185	0.0199	0.0182
Mean 2-year recidivism rate	0.409	0.406	0.390
N	1,893,330	867,534	701,481
Panel 3: Share of affordable vacant single-family rental units and recidivism within 3-years			
Outcome: 3-year recidivism	0.00398	0.00724	0.0460
	(0.0665)	(0.0878)	(0.0736)
Standard deviation of share of vacant affordable single-family units	0.0189	0.0202	0.0184
Mean 3-year recidivism rate	0.466	0.473	0.440
N	1,623,238	758,332	602,052
Panel 4: Share of affordable vacant single-family rental units (Panel 3 sample)			
Outcome: 1-year recidivism	-0.0300	-0.0853	0.0596
	(0.0556)	(0.0756)	(0.0646)
Standard deviation of share of vacant affordable single-family units	0.0189	0.0202	0.0184
Mean 3-year recidivism rate	0.466	0.473	0.440
N	1,623,238	758,332	602,052

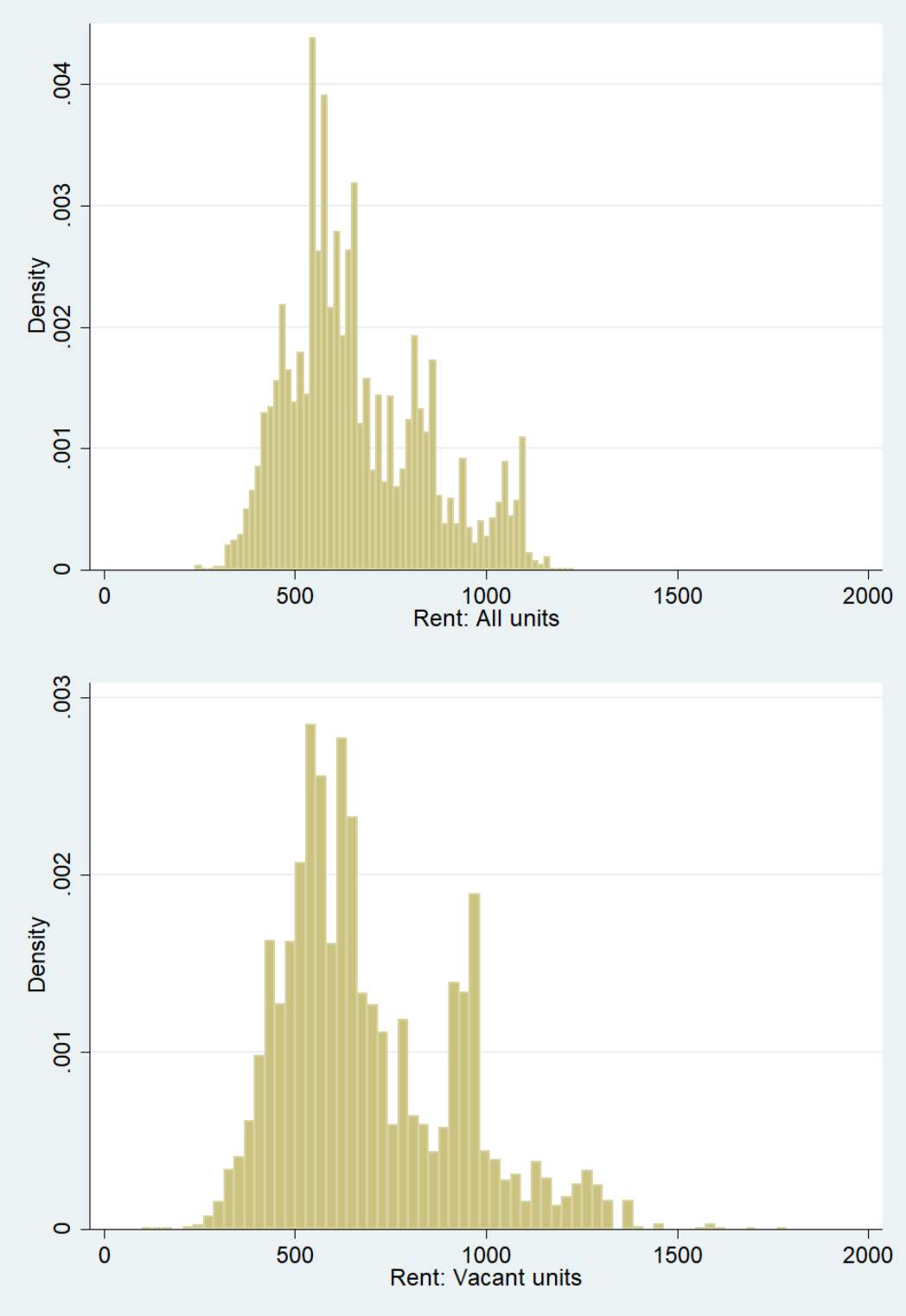
Note: See notes to Table 5.

Table 15. Estimates of the relationship between share of affordable vacant rental units and 1-year recidivism, excluding female felons

	All	Blacks	Whites
Panel 1: Share of vacant affordable units			
Outcome: 1-year recidivism	-0.109	-0.163	-0.0479
	(0.107)	(0.107)	(0.0987)
Standard deviation of share of vacant units	0.0262	0.0271	0.0250
Mean recidivism rate	0.304	0.288	0.294
N	1,885,406	862,506	674,157
Panel 2: Share of vacant affordable single-family units			
Outcome: 1-year recidivism	-0.169**	-0.211**	-0.0471
	(0.0760)	(0.0883)	(0.0730)
Standard deviation of share of vacant affordable single-family units	0.0182	0.0197	0.0179
Mean recidivism rate	0.304	0.288	0.294
N	1,885,406	862,506	674,157
Panel 3: Share of vacant affordable multi-family units			
Outcome: 1-year recidivism	-0.0565	-0.0714	-0.0449
	(0.0672)	(0.0647)	(0.0647)
Standard deviation of share of vacant affordable multi-family units	0.0322	0.0330	0.0314
Mean recidivism rate	0.304	0.288	0.294
N	1,885,406	862,506	674,157

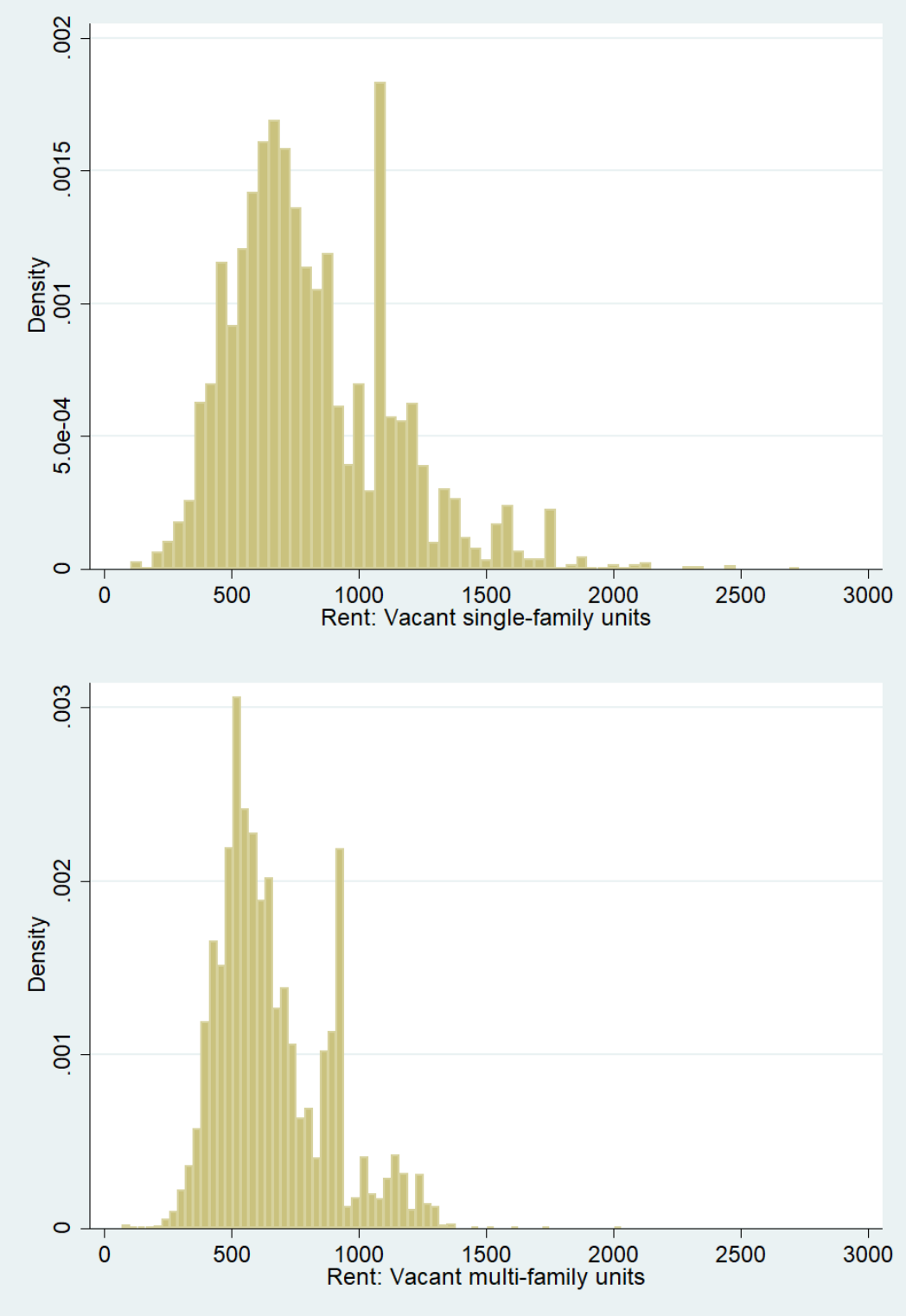
Note: See notes to Table 5.

Appendix Figure 1. Distribution of average rent faced by released prisoners at time of release



Note: Each observation is an estimate of the average rent in the county to which an ex-offender is released in a given year. Rent is estimated as the average price of rent in a county for each year in the 2005-2014 American Community Survey.

Appendix Figure 2. Distribution of average rent for vacant units faced by released prisoners at time of release, by structure type



Note: Note: Each observation is the average rent in the county to which an ex-offender is released in a given year. In the top panel (bottom panel), rent is estimated as the average price of rent for vacant units in single-family (multi-family) structures in a county for each year in the 2005-2014 American Community Survey.

Appendix Table 1. Tabulation of prisoner releases in the NCRP by state and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Alaska	0	0	0	0	0	0	0	4,530	0	0	4,530
Arizona	8,521	9,445	13,875	14,716	15,362	14,739	13,739	14,925	15,159	14,597	135,078
California	112,921	120,159	124,405	126,075	118,528	75,080	0	0	0	0	677,168
Colorado	954	1,077	1,294	1,345	1,483	1,484	1,302	342	334	305	9,920
Georgia	8,037	8,382	8,540	9,065	9,225	9,717	9,306	7,706	8,533	7,309	85,820
Illinois	21,966	20,750	19,121	18,862	19,153	15,555	0	17,426	0	0	132,833
Indiana	5,855	6,416	7,318	7,702	8,095	8,186	7,435	10,228	10,421	9,322	80,978
Iowa	0	2,203	2,056	2,048	2,442	2,028	2,005	913	891	707	15,293
Kansas	0	0	0	0	0	0	1,035	559	288	145	2,027
Kentucky	64	53	2,139	2,592	2,412	2,638	2,453	2,425	3,072	2,458	20,306
Massachusetts	0	0	0	0	1,100	1,192	967	673	600	461	4,993
Minnesota	3,112	3,277	3,430	3,509	3,484	3,886	4,035	3,707	3,810	3,347	35,597
Missouri	5,364	5,656	5,168	5,173	4,767	4,846	4,636	6,057	6,033	5,488	53,188
Montana	0	0	0	0	0	1	3	0	0	0	4
Nebraska	888	0	966	970	1,007	1,046	1,068	0	0	0	5,945
Nevada	0	0	0	4,851	4,888	4,744	4,468	4,425	4,332	4,210	31,918
New Hampshire	0	0	0	0	0	0	137	0	0	0	137
New Jersey	11,905	11,705	11,702	11,092	9,974	9,608	9,224	7,803	8,877	6,217	98,107
New York	19,711	17,542	18,679	18,735	17,209	16,642	15,798	15,911	6,994	6,416	153,637
North Carolina	8,730	8,692	9,241	9,578	10,293	10,447	10,473	11,724	11,044	0	90,222
Tennessee	6,444	6,748	6,914	6,632	6,591	6,123	5,953	7,203	6,955	5,587	65,150
Texas	46,937	47,690	43,974	38,100	36,217	33,040	32,958	45,736	41,679	38,872	405,203
Utah	1,402	2,615	2,562	2,579	2,470	2,298	2,339	2,376	2,291	2,141	23,073
Total	262,811	272,410	281,384	283,624	274,700	223,300	129,334	164,669	131,313	107,582	2,131,127

Note: Data are from the National Correction Reporting Program term record files from 2005-2015. Each observation is a prisoner release from a state prison.

Appendix Table 2. Tabulation of average 1-year recidivism rates for prisoners released by state and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Alaska								0.35		
Arizona	0.27	0.28	0.23	0.23	0.23	0.23	0.21	0.22	0.23	0.24
California	0.52	0.52	0.49	0.50	0.45	0.41				
Colorado	0.32	0.31	0.30	0.35	0.36	0.36	0.31	0.30	0.39	0.31
Georgia	0.10	0.11	0.09	0.10	0.09	0.09	0.09	0.08	0.09	0.09
Illinois	0.36	0.30	0.27	0.28	0.32	0.31		0.25		
Indiana	0.19	0.23	0.23	0.22	0.20	0.19	0.20	0.21	0.24	0.20
Iowa		0.24	0.19	0.23	0.20	0.21	0.14	0.15	0.17	0.21
Kansas							0.08	0.15	0.15	0.19
Kentucky	0.05	0.02	0.24	0.19	0.20	0.23	0.22	0.32	0.35	0.34
Massachusetts					0.13	0.14	0.10	0.08	0.07	0.05
Minnesota	0.38	0.38	0.37	0.36	0.34	0.35	0.35	0.36	0.36	0.37
Missouri	0.37	0.36	0.35	0.30	0.24	0.25	0.24	0.23	0.25	0.27
Montana						1.00	0.33			
Nebraska	0.00		0.00	0.00	0.00	0.00	0.01			
Nevada				0.12	0.13	0.14	0.16	0.17	0.16	0.15
New Hampshire							0.44			
New Jersey	0.23	0.23	0.20	0.17	0.15	0.17	0.17	0.17	0.15	0.14
New York	0.22	0.24	0.24	0.24	0.24	0.24	0.23	0.25	0.30	0.28
North Carolina	0.13	0.13	0.12	0.12	0.12	0.11	0.10	0.12	0.17	
Tennessee	0.25	0.24	0.23	0.23	0.20	0.19	0.20	0.19	0.18	0.19
Texas	0.20	0.19	0.16	0.18	0.17	0.17	0.16	0.17	0.18	0.17
Utah	0.39	0.40	0.36	0.35	0.33	0.30	0.27	0.30	0.31	0.32

Note: Data are from the National Correction Reporting Program term record files from 2005-2014. Each observation is a release from a correctional facility.

Appendix Table A3. Estimates of the relationship between share of affordable vacant rental units and 1-year recidivism including education controls

	All	Blacks	Whites
Panel 1: Share of vacant affordable units			
Outcome: 1-year recidivism	0.0786	-0.0348	0.0824
	(0.0622)	(0.0838)	(0.0699)
Standard deviation of share of vacant affordable units	0.0244	0.0255	0.235
Mean recidivism rate	0.208	0.220	0.196
N	1,198,124	612,796	476,946
Panel 2: Share of vacant affordable single-family units			
Outcome: 1-year recidivism	-0.0383	-0.170***	0.0848
	(0.0538)	(0.0651)	(0.0705)
Standard deviation of share of vacant affordable single-family units	0.0189	0.0197	0.0185
Mean recidivism rate	0.208	0.220	0.196
N	1,198,124	612,796	476,946
Panel 3: Share of vacant affordable multi-family units			
Outcome: 1-year recidivism	0.0497	0.00784	0.00718
	(0.0422)	(0.0561)	(0.0494)
Standard deviation of share of vacant affordable multi-family units	0.0312	0.0321	0.0305
Mean recidivism rate	0.208	0.220	0.196
N	1,198,124	612,796	476,946

Note: See notes to Table 5. Education controls include indicators for whether the released offender has less than a high school education, some high school, is a high school graduate, or has any college.

Appendix Table A4. Estimates of the relationship between share of affordable vacant single-family rental units and 1-year recidivism, controlling for the share of affordable vacant multi-family rental units

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel 1: All			
Single-family units	-0.146**	-0.145*	-0.144*	-0.145**	-0.155**	-0.149*
	(0.0720)	(0.0735)	(0.0732)	(0.0733)	(0.0754)	(0.0732)
Multi-family units	-0.0377	-0.0189	-0.0116	-0.0116	-0.0142	-0.0314
	(0.0687)	(0.0726)	(0.0744)	(0.0742)	(0.0702)	(0.0658)
Mean 1-year recidivism rate	0.295	0.295	0.295	0.295	0.295	0.295
N	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127	2,131,127
			Panel 2: Black offender sample			
Single-family units	-0.216**	-0.217**	-0.209**	-0.204**	-0.208**	-0.202**
	(0.0903)	(0.0901)	(0.0885)	(0.0877)	(0.0899)	(0.0860)
Multi-family units	-0.0211	-0.0205	-0.0134	-0.0133	-0.0176	-0.0392
	(0.0743)	(0.0718)	(0.0696)	(0.0685)	(0.0636)	(0.0596)
Mean 1-year recidivism rate	0.280	0.280	0.280	0.280	0.280	0.280
N	955,307	955,307	955,307	955,307	955,307	955,307
			Panel 3: White offender sample			
Single-family units	-0.00388	-0.000356	-0.00889	-0.0155	-0.0260	-0.0261
	(0.0717)	(0.0715)	(0.0719)	(0.0717)	(0.0710)	(0.0699)
Multi-family units	-0.0315	-0.0194	-0.0214	-0.0224	-0.0247	-0.0314
	(0.0625)	(0.0634)	(0.0634)	(0.0641)	(0.0636)	(0.0632)
Mean 1-year recidivism rate	0.283	0.283	0.283	0.283	0.283	0.283
N	793,806	793,806	793,806	793,806	793,806	793,806
County & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Offender demographic controls	No	Yes	Yes	Yes	Yes	Yes
Sentencing controls	No	No	Yes	Yes	Yes	Yes
Offense controls	No	No	No	Yes	Yes	Yes
County labor market controls	No	No	No	No	Yes	Yes
County crime controls	No	No	No	No	No	Yes

Note: See notes to Table 5.

Appendix Table A5. Estimates of the relationship between share of affordable vacant rental units and 1-year recidivism including state-by-year fixed effects

	All	Blacks	Whites
Panel 1: Share of vacant affordable units			
Outcome: 1-year recidivism	-0.0764	-0.151*	-0.00164
	(0.0665)	(0.0864)	(0.0541)
Standard deviation of share of vacant affordable units	0.0623	0.0272	0.0251
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806
Panel 2: Share of vacant affordable single-family units			
Outcome: 1-year recidivism	-0.0699	-0.0938	-0.00704
	(0.0454)	(0.586)	(0.0474)
Standard deviation of share of vacant affordable single-family units	0.0182	0.0196	0.0179
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806
Panel 3: Share of vacant affordable multi-family units			
Outcome: 1-year recidivism	-0.0471	-0.0749	-0.0210
	(0.0428)	(0.0574)	(0.0348)
Standard deviation of share of vacant affordable multi-family units	0.0323	0.0331	0.0315
Mean recidivism rate	0.295	0.280	0.283
N	2,131,127	955,307	793,806

Note: See notes to Table 5.