Racial Discrimination in Eviction Filing

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Abstract

Minority renters are 42% more likely to face an eviction case than white renters. I develop and apply a simple framework to test whether this reflects discrimination by landlords. Discrimination is identified by racial disparities in back rent owed at the time of an eviction filing, conditional on landlord and monthly contract rent. Distinguishing the sources of discrimination requires further conditioning and conducting a marginal outcome test which compares a landlord's rate of winning court-ordered repossession of the property by tenant race. Using detailed administrative data from Philadelphia, I find evidence of discrimination: landlords tolerate 4.5% less back rent from minority tenants before filing an eviction case. Between 49% and 73% of landlords exhibit racial discrimination. Discrimination is higher among non-corporate, white landlords and against minority renters in majority-white neighborhoods. I find additional evidence consistent with accurate statistical discrimination: landlords observe that winning repossession of the property from minority tenants requires less back rent and therefore apply lower filing thresholds to minority tenants to achieve the same rate of repossession. *(JEL: J15, I30, R30)*

1   Introduction

Each year, landlords file 3.6 million eviction cases in the U.S. (Gromis et al. 2022), placing families at risk of homelessness. Minority renters are disproportionately exposed to this risk as they are 42% more likely to face an eviction case and 24% more likely to be evicted than white renters (Hepburn et al. 2020).[1] These disparities could be explained by racial differences in lease violations, racial differences in matching to strict landlords, or landlords discriminating by tolerating lease violations differently by race. This paper develops and applies new methods to measure such discrimination and understand its drivers.

When measuring racial discrimination, researchers must account for racial differences in the underlying "qualification" of individuals for a treatment. In most settings, "qualification" is at best partially unobserved, motivating strategies that leverage random assignment to decision-makers (Arnold et al. 2018; Dobbie et al. 2021; Arnold et al. 2022; Baron et al. 2023), structural models of decision-making (Knowles et al. 2001; Anwar and Fang 2006), control groups of unbiased decision-makers (Goncalves and Mello 2021), or the ability to experimentally vary fictitious individuals' race (Bertrand and Mullainathan 2004; Ewens et al. 2014; Kline et al. 2022). The context of eviction, however, is uniquely well-suited to study discrimination given that a tenant's "qualification" for an eviction filing (caused only by non-payment) is fully summarized by the amount of back rent owed at the time of the filing. Using detailed eviction filing records from Philadelphia, I develop a new test for discrimination that leverages this comprehensive and observable measure of "qualification."

I consider a simple framework in which a landlord discriminates by tolerating non-payment of rent differently by tenant race before filing an eviction case over non-payment. This notion of discrimination is rooted in the law: specifically, the Fair Housing Act which prohibits landlords from selectively evicting minority tenants even if the eviction would otherwise be lawful—for example, due to non-payment of rent (HUD 2021a). Formally, this concept of racial discrimination equates to a landlord having different filing thresholds of back rent by tenant race and aligns with the notion of "total discrimination" in Bohren et al. (2022) as it conditions on a natural definition of eviction "qualification." Total discrimination may be driven by indirect discrimination arising from differences in tenants' non-race characteristics (Bohren et al. 2022), accurate statistical discrimination arising from actual racial differences in the landlord's payoff from filing (Phelps 1972; Arrow 1974; Aigner and Cain 1977), or landlords having racially biased beliefs or preferences (Becker 1957; Bordalo et al. 2016; Bohren et al. 2019).

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[1]Based on replication data from Hepburn et al. (2020), the U.S. eviction filing (judgment) rate is 4.09% (2.03%) among white renters and 5.83% (2.52%) among minority renters.

In my framework, total racial discrimination is identified by racial disparities in back rent owed at the time of an eviction filing. The simplest derivation of this test assumes that tenants gradually fall behind on rent until the amount of back rent reaches a landlord's (potentially race-specific) threshold for filing an eviction case. To allow a landlord's filing threshold of back rent to depend on either the total amount or months of back rent owed, I condition these disparities on landlord and monthly contract rent.

Applying this framework to Philadelphia eviction filings caused only by non-payment of rent, I find evidence of racial discrimination. On average, landlords tolerate 4.5% ($133) less back rent from tenants belonging to racial minority groups than from white tenants before filing an eviction case. This is a meaningful amount of racial discrimination: my estimates imply that 24% of minority eviction filings in Philadelphia (2,306 filings per year) occur too soon relative to the average white filing with the same landlord and contract rent. Racial discrimination is not driven by a small number of discriminatory landlords and instead appears highly prevalent. I estimate that between 49% and 73% of landlords in my sample discriminate, which appears to be driven by non-corporate, white landlords. Heterogeneity analysis further reveals that discrimination in eviction filing is most severe against minority tenants living in majority-white neighborhoods.

I next extend the framework to distinguish between the sources of racial discrimination: indirect discrimination, accurate statistical discrimination, or racial bias. I find limited scope for indirect discrimination; controlling for observable non-race tenant characteristics does not substantially change the discrimination estimate. I then consider whether the remaining direct discrimination reflects accurate statistical discrimination or racial bias. Landlords may exhibit accurate statistical discrimination if they observe that winning repossession of the property in court from minority tenants appears to require less back rent than cases against white tenants. I do not diagnose the source of this disparity—unequal access to legal representation, racial differences in landlord-tenant negotiations, discrimination by judges, or some other factor. Regardless of the source, if landlords exhibit accurate statistical discrimination, then they should be equally likely to win repossession in marginal cases against white and minority tenants. Any deviation from equal repossession rates reflects racial bias in eviction filing.

I formalize this logic with a marginal outcome test for racial bias in eviction filing (Canay et al. 2020; Hull 2021), which follows recent evaluations of bias in other settings such as vehicle searches, capital sentencing, pretrial release, lending, and foster care (Knowles et al. 2001; Persico and Todd 2006; Alesina and La Ferrara 2014; Anwar and Fang 2015; Arnold et al. 2018; Marx 2021; Dobbie et al. 2021; Baron et al. 2023). I conduct my test by comparing a landlord's rate of winning repossession across white and minority tenants with the same

contract rent. The test is valid when landlords file eviction cases at their threshold of back rent (marginal outcomes) and a landlord's true payoff from winning repossession does not vary with the tenant's race conditional on control variables (no omitted payoff bias).

I find evidence consistent with accurate statistical discrimination: landlords apply lower filing thresholds to minority tenants to achieve the same rate of repossession in court. This finding reflects that landlords account for racial disparities at later stages of the eviction process when deciding to file a case. An implication of this result is that policy responses to eliminate racial disparities in eviction court should reduce earlier racial discrimination by landlords filing eviction cases. Further upstream, however, it is also possible that landlords would adjust how they initially select tenants for rental units.

This paper builds upon existing evidence of discrimination in the housing market. Racial discrimination during the housing search process is well-documented. Correspondence studies that send fictitious rental applications to landlords generally find lower callback rates for applicant names with a high likelihood of association with a minority group (Carpusor and Loges 2006; Ahmed and Hammarstedt 2008; Hanson and Hawley 2011; Ewens et al. 2014; Christensen et al. 2021). A related literature uses in-person audits to test for discrimination against prospective homebuyers (Yinger 1986; Page 1995). Other research finds that minority homebuyers face discrimination when seeking mortgage loans (Munnell et al. 1996; Ladd 1998; Turner and Skidmore 1999; Ross et al. 2008; Hanson et al. 2016). Despite the known adverse effects of losing housing (Collinson et al. 2022; Diamond et al. 2020), less is known about whether minorities face racial discrimination at this juncture. I contribute evidence of racial discrimination at the margin of housing loss, confirming that discrimination in the housing market persists even after entry into housing.

Methodologically, this paper builds upon a recent literature developing new measures of discrimination. Correspondence studies estimate discrimination by experimentally varying fictitious applicant names that are distinctly associated with different groups (Bertrand and Mullainathan 2004; Jacquemet and Yannelis 2012; Ewens et al. 2014; Edelman et al. 2017; Agan and Starr 2018; Kline et al. 2022). Measuring discrimination is generally more challenging, however, in observational data on high-stakes decisions such as eviction. The central challenge requires researchers to account for unobserved racial differences in the "qualification" of individuals for a treatment. One strand of literature overcomes this problem using structural models of decision-making (Knowles et al. 2001; Anwar and Fang 2006). More recent work leverages quasi-experimental institutional features such as random assignment to decision-makers (Arnold et al. 2018; Dobbie et al. 2021; Arnold et al. 2022; Baron et al. 2023), an identifiable control group of non-discriminatory decision-makers (Goncalves and Mello 2021), or observable outcomes from both random and algorithmic decision-making

([Elzayn et al. 2023](#)). This paper contributes a new method for estimating discrimination that leverages the ability to fully observe the relevant "qualification" measure for treatment in the context of eviction filing (i.e. back rent).

The remainder of this paper is organized as follows. Section 2 details the legal framework governing discrimination in eviction and the eviction filing process. Section 3 describes the Philadelphia eviction court records I analyze. Section 4 models a landlord's eviction filing decision and demonstrates how discrimination enters. Section 5 outlines my empirical approach to test for total discrimination. Section 6 reports estimates of total discrimination in eviction filing. Section 7 distinguishes between the sources of total discrimination. Section 8 concludes.

2 Institutional Context

2.1 Fair Housing Act

The foundation of anti-discrimination law in the U.S. housing market is the Fair Housing Act. It prohibits discrimination by housing providers, such as landlords, whose discriminatory practices make housing unavailable on the basis of race, religion, sex, national origin, family status, or disability. When considering evictions in particular, the Department of Housing and Urban Development (HUD) states that "selective evictions because of protected class (such as race or national origin) violate the Fair Housing Act even when the eviction might otherwise have been lawful" (HUD 2021a). More explicitly, HUD provides guidance to tenants that "Even if you are behind on your rent and subject to eviction, a landlord may not pick and choose which tenants to evict based on any protected characteristic" (HUD 2021b). They offer the following example of discrimination: "A landlord evicts a Black tenant for unpaid rent but does not evict a White tenant who has unpaid rent" (HUD 2021b).

I interpret these statements as the Fair Housing Act prohibiting a landlord from tolerating non-payment of rent differently by tenant race before filing an eviction case over non-payment.[2] I formalize this concept of discrimination as a landlord using different filing thresholds for white and minority tenants. The threshold concept is intuitive in cases caused only by non-payment of rent, where it is simply a measure of back rent. A landlord may

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[2]Note that this inherently rests on an argument that landlords should only consider non-payment of rent when deciding to file a non-payment-based eviction case. This argument is supported by "good cause" eviction laws in many jurisdictions which dictate the allowable reasons a landlord may file an eviction case against a tenant. Typically, allowable causes for eviction include non-payment of rent, property damage, disturbances, criminal activity, or other lease violations (Gallagher and Vasquez 2022). This suggests that absent any property damage or other allowable causes, landlords should only consider non-payment of rent.

reasonably measure back rent in dollars or months owed, however.[3] To account for this, I define discrimination as racial disparities in a landlord's filing threshold of back rent among tenants with the same monthly contract rent.

Tenants equally behind on rent are equally qualified for an eviction filing, absent any other lease violations. This means that racial disparities in a landlord's filing threshold conditional on contract rent generates selective filings against minority tenants compared to equally qualified white tenants. This measure of discrimination is thus total discrimination—racial disparities in treatment among equally qualified individuals (Bohren et al. 2022)—which can arise from three potential sources. First, indirect discrimination can generate racial disparities in thresholds if landlords incorporate non-race characteristics correlated with race into filing decisions (Bohren et al. 2022). Second, accurate statistical discrimination can lead to racial disparities in thresholds if landlords account for actual racial differences in their payoff from filing (Phelps 1972; Arrow 1974; Aigner and Cain 1977). Third, racial bias can generate racial disparities in thresholds stemming from landlords' biased preferences or beliefs (Becker 1957; Bohren et al. 2019; Bordalo et al. 2016). I formalize these sources of discrimination and demonstrate how they can generate patterns of total discrimination in Section 4.

A benefit of estimating this measure of total discrimination is that it closely relates to the legal doctrine of disparate impact (Arnold et al. 2022; Bohren et al. 2022). The Fair Housing Act protects not only against selective evictions driven by racially discriminatory intent but also against any selective evictions that have a disparate impact on racial minorities if they were not necessary to achieve a legitimate interest for the landlord (HUD 2023). While selective evictions driven by discriminatory intent reflect only direct discrimination on the basis of race (accurate statistical discrimination or racial bias), the broader concept of disparate impact also includes indirect discrimination. The total discrimination measure I estimate in this paper aligns with unlawful disparate impact if there exists no legitimate interest for a landlord to selectively file non-payment of rent eviction cases against tenants equally behind on rent.[4]

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[3]In Section 6.2, I consider an additional unit of measure that landlords may utilize when considering non-payment of rent: back rent relative to the tenant's tenure in the rental property.

[4]A potential violation of this stems from the possibility that landlords exhibit indirect discrimination based on tenant income. Specifically, a landlord selectively evicts low-income tenants who owe less back rent than their higher-income counterparts because the landlord predicts low-income tenants are less likely to pay in the future. This tension is rooted in whether selectively evicting minority tenants is lawful if it is solely driven by a landlord's predictions about future earnings coming from observed tenant income. In practice, I find no evidence of this type of indirect discrimination in Section 7.1.

2.2 Eviction Filing in Philadelphia

Eviction filings are the first publicly documented step in the eviction process, although tenants may receive a short period of notice beforehand.[5] When filing an eviction case in Philadelphia, landlords indicate all causes of the filing, selecting from the following choices: non-payment of rent, breach of a condition of the lease, and/or termination of the lease term.[6] Note that they may indicate multiple causes. In the filing, the landlord also reports the amount of back rent, fees, and physical damages, information on any other lease violations, and details of the lease agreement. After submitting this information, the landlord and tenant are notified of the scheduled hearing date.

2.3 Eviction Court Process in Philadelphia

After a landlord files an eviction case, the eviction case could proceed in many ways. A landlord may withdraw the case prior to the scheduled hearing date, typically in response to payment of the past due rent, the tenant voluntarily moving out, or a private settlement agreement. Barring a withdrawal, if the tenant does not appear in housing court for the scheduled hearing, the case results in a default judgment in favor of the landlord. In the relatively rare occurrence that the landlord does not appear in court for the scheduled hearing, the case results in a default judgment in favor of the tenant.

If both the landlord and tenant appear in court, policy in Philadelphia requires the parties to attempt to reach an agreement before seeing a judge. This negotiation occurs between the landlord and tenant and any attorneys present.[7] If the parties reach an agreement, a staff member from the Municipal Court Mediation Unit reviews the agreement and confirms that both parties understand the agreement. Both parties then sign the agreement, and it is entered into the court record as a judgment by agreement (JBA). If the parties cannot reach an agreement, they contest the case before a judge who decides the case.[8]

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[5]Philadelphia landlords are mandated to provide the tenant with at least 10 days notice prior to filing eviction cases over non-payment of rent. In practice, however, tenants are often given less or no notice prior to the case filing. Among tenants in Philadelphia eviction court, Hoffman and Strezhnev (2022) find that 67% of unsubsidized lease agreements waive or reduce the right to this notice.

[6]During the study period from 2006 through 2019, Philadelphia landlords could terminate a lease for any reason except for in retaliation for the tenant reporting a complaint, joining a tenant organization, or domestic violence in which the tenant was a victim. Most filings (94%), however, involved non-payment of rent. 2019 legislation introduced the requirement of "good cause" for filing an eviction case with allowable causes including, non-payment of rent, breach of lease, property damage, and other violations. For details, see Unfair Rental Practices, Philadelphia Code § 9-804.

[7]Over 80% of landlords have legal representation, but less than 10% of tenants are represented. If neither party has an attorney, a volunteer mediator is provided.

[8]Conditional on both parties appearing in court, approximately 90% of cases result in a JBA, meaning that judges preside over very few eviction cases in Philadelphia.

Any judgment that is entered via default, a JBA, or decided by a judge may include a judgment for possession of the property and/or a judgment for money. After any judgment for possession in favor of the landlord is entered, the landlord may file for a writ of possession which will then be served to the tenant before the sheriff's office executes the eviction.

3 Data

3.1 Eviction Court Records

I analyze the universe of residential eviction cases filed in Philadelphia between 2006 and 2019.[9] These court records contain information on the filing date, defendant (tenant) names, plaintiff (landlord) names and addresses, property address, monthly contract rent, cause(s) of the case filing, itemized claim amount (including back rent, physical damages, etc.), judgments, and whether the landlord filed for a writ of possession. I construct landlord identifiers by linking landlord names and addresses found in eviction case records. See Appendix B.1 for details.

The itemized amounts claimed are a unique feature of these data that are rarely observable in eviction case records from other jurisdictions. This is essential for testing for discrimination as the amounts provide a continuous measure of a landlord's grievances against a tenant at the time of an eviction filing. Only certain lease violations related to, for example, noise complaints or unapproved guests may not be reflected in the claimed amounts. For this reason, I focus on cases caused only by non-payment of rent for which the amount of back rent claimed should be a comprehensive measure of a tenant's "qualification" for the eviction filing.

3.2 Race Imputation

I impute the race of tenants using their names and property addresses listed on the eviction filing. To do so, I utilize the fully Bayesian Improved Surname Geocoding (fBISG) algorithm developed by Imai et al. (2022). The fBISG approach estimates the conditional posterior probability that tenant i belongs to racial group r given i's first name, last name, and census block. I classify tenant i as belonging to racial group r if the conditional posterior probability is at least 80%.[10] See Appendix B.2 for more details on the fBISG methodology. I conduct all analysis at the case filing level. Since a filing may name multiple tenants who

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[9]Philadelphia civil court data for this study were accessed through the Civil Justice Data Commons at Georgetown University (Georgetown Civil Justice Data Commons 2023).

[10]In Section 6.2, I demonstrate that the results are robust to using other cutoffs.

Table 1: Racial Composition of Eviction Filings

	Filings	Renters
Asian	1.44%	5.46%
Black	77.17%	44.36%
Hispanic	7.75%	10.92%
White	12.38%	36.83%
Other/Mixed	1.26%	2.43%
N	234,407	

This table reports the racial composition of eviction filings and renters in Philadelphia. The filing sample excludes filings against tenants with race imputations less than 80% probable. The racial composition of renters is sourced from the 2010 decennial census.

live in the same apartment unit, I classify filings into racial groups based on the imputed classifications of each individual tenant named.[11] The analysis sample excludes filings in which no tenant can be classified with at least 80% certainty. I drop 20% of filings (N=59,744) due to unknown tenant race.

Table 1 reports the racial composition of filings in the analysis sample of eviction cases. For comparison, I also report the racial composition of the population of renters in Philadelphia from the 2010 decennial census. The vast majority of eviction cases are filed against non-white tenants. Black tenants appear especially over-represented while white tenants appear especially under-represented in eviction filings. For the remainder of this paper, I compare landlords' treatment of white and minority tenants, where a minority tenant is defined as Black, Hispanic, Asian, or other/mixed.

3.3 Descriptive Statistics

Not only are minority tenants more likely to face an eviction filing, but the average claim amount tenants owe at the time of the filing is lower for minority tenants than white tenants (Table 2).[12] Considering only the portions of the claim for which tenants are directly responsible—back rent, physical damages, and late fees,—the average amounts owed are still lower for minority tenants than white tenants.

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[11]For filings against multiple tenants, I classify a tenant group as belonging to racial group r if all individual tenants with at least 80% likely race imputations are classified as r. I classify a tenant group as mixed race if the tenants with at least 80% likely race imputations are classified as different racial groups.

[12]The claim amount captures the total amount the landlord claims the tenant owed at the time the landlord filed the eviction case. The amount claimed on eviction filings tends to be mostly composed of back rent, but landlords also claim physical damages, late fees, attorney fees, and other fees.

Table 2: Descriptive Statistics

	All causes		Non-payment of rent only	
	White	Minority	White	Minority
Claim Details				
Total Claim Amount	2998.04	2123.21	3045.54	2035.40
	(6583.56)	(5168.69)	(7292.21)	(3798.34)
Back Rent	2411.22	1699.64	2477.22	1650.04
	(6249.55)	(4934.50)	(6979.17)	(3475.39)
Late Fees	94.24	71.37	96.15	72.93
	(257.65)	(158.21)	(219.93)	(146.44)
Physical Damages	5.15	2.14	1.97	0.73
	(168.86)	(99.96)	(129.88)	(74.63)
Attorney Fees	296.25	216.98	298.85	199.29
	(348.42)	(322.28)	(382.80)	(357.65)
Other Fees	190.06	132.54	169.98	111.94
	(1490.71)	(1001.30)	(1557.60)	(854.07)
Other Characteristics				
Contract Rent	947.32	781.95	1003.11	818.75
	(701.23)	(28187.43)	(749.19)	(32084.06)
N	29,008	205,399	18,935	133,720

This table reports the means and standard deviations of variables in the analysis sample of Philadelphia eviction cases. The analysis sample includes eviction filings with at least 80% certain tenant race imputations and non-missing claim amounts and back rent. The total claim amount is the sum of back rent, late fees, physical damages, attorney fees, and other fees that the landlord claims the tenant owes at the time of the case filing. Contract rent is the amount of rent owed monthly.

The full distribution of claim amounts illustrates more clearly that minority tenants owe less than white tenants when landlords file eviction cases (Figure 1a). Among cases caused only by non-payment of rent, the minority distribution of back rent owed at filing is also lower than the white distribution of back rent (Figure 1b). From Table 2, minority tenants with eviction filings tend to have lower monthly contract rents than white tenants. This means that minority tenants could owe equal months of back rent at the time of the filing as white tenants. When considering back rent measured in months instead of dollars, however, minority tenants still appear to owe less at the time of the filing, although slightly less clearly given the considerable bunching around integer months of back rent (Figure A1a). Among tenants with below median contract rents in particular, minority tenants owe strikingly fewer months of back rent than white tenants (Figure A1b).

Figure 1: Distribution of Amounts Owed at Filing

(a) All Causes   (b) Non-Payment Only
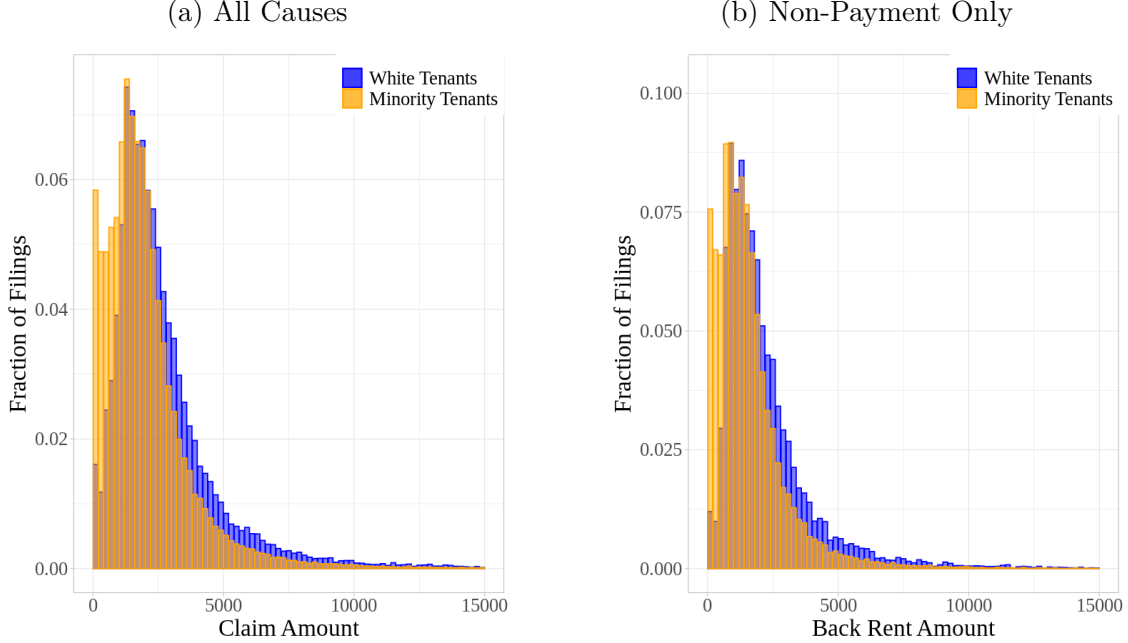
Subfigure (a) plots the claim amount distribution separately for Philadelphia eviction filings against white and minority tenants. Subfigure (b) plots the back rent distribution of filings separately for filings against white and minority tenants that were caused only by non-payment of rent. Both subfigures exclude filings for which no tenant race could be imputed with at least 80% certainty.

4 Conceptual Framework

To understand how these racial disparities in the amount owed at filing could be explained by racial discrimination, I provide a framework to conceptualize how discrimination may enter a landlord's eviction filing decision. In this section, I first provide a model of a landlord's threshold rule for filing eviction cases. I then use this framework to demonstrate how discrimination can arise from three potential sources—indirect discrimination, accurate statistical discrimination, or racial bias—and discuss the testable implications of each source.

4.1 Landlord Filing Decision

Consider all tenants of a single landlord. Let R_i denote tenant race and let Z_i capture all characteristics of tenant i observable to the landlord besides race. Z_i may include individual characteristics such as income and also characteristics of the rental property including neighborhood factors. Each month, tenant i agrees to pay the landlord the contract rent amount Y_i^0. If the tenant falls behind on rent, they accrue some amount of back rent, $X_i(t)$, owed to the landlord. For simplicity, assume that the tenant commits no other lease violations

besides non-payment of rent. At any time t such that $X_i(t) > 0$, the landlord can legally file an eviction case over non-payment. Let $D_i(t) = 1$ denote this eviction filing action taken by the landlord. Filing an eviction case is costly, however. The landlord pays a fixed cost c to file an eviction case, which reflects any unrecoverable court filing costs and legal fees.[13]

If the landlord chooses to file an eviction case against i, the case could either result in the landlord winning repossession of the property to rent to a new tenant ($Y_i^* = 1$) or the current tenant remaining in the property ($Y_i^* = 0$). The true expected probability that the landlord wins repossession of the property is $\tilde{p}(x, y, z, r) = \mathbb{E}[Y_i^* = 1 | X_i(t) = x, Y_i^0 = y, Z_i = z, R_i = r]$. I assume $\tilde{p}(x, y, z, r)$ is weakly increasing in back rent, x. The likelihood of winning repossession also depends on Y_i^0 since the ongoing contract rent amount informs the severity of the amount of back rent. Z_i enters $\tilde{p}$ given that tenants with lower incomes or greater childcare responsibilities, for example, may have different likelihoods of appearing in eviction court as scheduled, affecting the likelihood of the landlord winning repossession. R_i enters $\tilde{p}$ to allow for the possibility that minority tenants face unequal access to court resources or eviction court judges exhibit racial discrimination. The landlord may have biased perceptions about the probability of winning repossession of the property, however. I define the landlord's perceived probability of winning repossession as $p(x, y, z, r) = \tilde{p}(x, y, z, r) + b^p(r)$. The bias term $b^p(r)$ allows for landlords to have racially biased beliefs about the likelihood of repossession (Bohren et al. 2019; Bordalo et al. 2016).

The landlord's true payoff from winning repossession of the property from tenant i is $\tilde{v}(y, z)$ for $Y_i^0 = y$ and $Z_i = z$. Intuitively, $\tilde{v}$ captures the difference in expected future rental income from replacing tenant i with some unknown new tenant. Non-race characteristics, Z_i, enter $\tilde{v}$ since i's factors such as income may predict the likelihood that i pays rent in the future, affecting the landlord's payoff from replacing them.[14] Contract rent, Y_i^0, enters $\tilde{v}$ since it captures the rental value of the property that the landlord could earn from a paying tenant. I assume that race cannot impact the true payoff $\tilde{v}$, holding fixed Z_i and Y_i^0. I model the landlord's perceived payoff from winning repossession, however, as $v(y, z, r) = \tilde{v}(y, z) + b^v(r)$. The perceived payoff v additionally varies with tenant race r to allow for the possibility that the landlord exhibits racial bias, $b^v(r)$. The bias term, $b^v(r)$, may reflect taste-based discrimination (Becker 1957) if the landlord values removing minority tenants from the property differently from removing white tenants, conditional on

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[13]I allow c, as well as the $\tilde{p}$ and $\tilde{v}$ functions defined below, to vary across landlords when I bring the model to data. Here, however, I simplify the model's notation by considering the behavior of a single landlord.

[14]It is also possible that back rent, $X_i(t)$, predicts the likelihood i pays rent in the future. This would not affect the ability to formulate the landlord's filing decision as a threshold rule since $\tilde{v}$ would also be increasing in back rent. As such, the test for total discrimination described in Section 5 does not require excluding $X_i(t)$ from $\tilde{v}$. Any dependence of $\tilde{v}$ on $X_i(t)$ would only be a potential concern when applying Propositions 1 and 2 discussed below to the data. I address this concern in Section 7.2.

$\tilde{v}$. Alternatively, $b^v(r)$ may reflect racially biased beliefs or stereotypes (Bohren et al. 2019; Bordalo et al. 2016) about the likelihood of the current tenant paying rent in the future.

The landlord files an eviction case against tenant i if the perceived payoff weighted by the perceived probability of winning repossession exceeds the fixed cost of filing:[15]

$$D_i(t) = \mathbb{1}\{p(X_i(t), Y_i^0, Z_i, R_i)v(Y_i^0, Z_i, R_i) \geq c\} \tag{1}$$

By monotonicity of $p(x, y, z, r)$ over x, this is equivalent to a threshold rule for filing an eviction case:

$$D_i(t) = \mathbb{1}\{X_i(t) \geq \tau_i\} \tag{2}$$

where

$$\tau_i = p^{-1}\left(\frac{c}{v(Y_i^0, Z_i, R_i)}, Y_i^0, Z_i, R_i\right) = \tilde{p}^{-1}\left(\frac{c}{\tilde{v}(Y_i^0, Z_i) + b^v(R_i)} - b^p(R_i), Y_i^0, Z_i, R_i\right) \tag{3}$$

From this threshold rule, it is apparent that the landlord's threshold τ_i is a function of the tenant's non-race characteristics, contract rent, and race.

4.2   Discrimination Definition and Sources

From Section 2.1, a landlord exhibits racial discrimination if they use different filing thresholds, τ_i, by tenant race conditional on contract rent:

$$\mathbb{E}[\tau_i | Y_i^0 = y, R_i = minority] \neq \mathbb{E}[\tau_i | Y_i^0 = y, R_i = white] \tag{4}$$

Racial discrimination against minority (white) tenants is the specific case of lower thresholds for minority (white) tenants. Given that τ_i may vary by a tenant's race and non-race characteristics (Equation 3), racial discrimination (Equation 4) can arise from three potential sources: indirect discrimination, accurate statistical discrimination, or racial bias.

First, indirect discrimination arises from components of Z_i that are correlated with race. Such variation in Z_i can generate racial differences in τ_i even if neither p nor v depend on R_i. If indirect discrimination alone explains total racial discrimination, then thresholds should be equal across race holding fixed Z_i:

$$\mathbb{E}[\tau_i | Y_i^0 = y, Z_i = z, R_i = minority] = \mathbb{E}[\tau_i | Y_i^0 = y, Z_i = z, R_i = white] \tag{5}$$

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[15]This follows from a landlord maximizing utility $U_0 + D_i(t)(p(X_i(t), Y_i^0, Z_i, R_i)v(Y_i^0, Z_i, R_i) - c)$ for some U_0.

If instead the landlord exhibits direct discrimination on tenant race (accurate statistical discrimination or racial bias), then thresholds would vary by race even after holding fixed Z_i.

Second, a landlord exhibits accurate statistical discrimination if $b^p(minority) = b^p(white)$ and $b^v(minority) = b^v(white)$. Accurate statistical discrimination can generate patterns of total discrimination due to the dependence of $\tilde{p}$ on R_i. In essence, a landlord's accurate predictions about any racial differences in the likelihood of winning repossession in court results in their filing threshold varying by tenant race. To test this source, I can compare the marginal outcomes of filings across tenant race:

Proposition 1. If a landlord exhibits accurate statistical discrimination, then $\mathbb{E}[Y_i^*|X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = minority] = \mathbb{E}[Y_i^*|X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = white]$.

The intuition of Proposition 1 is that a landlord accurately accounting for any racial differences in the likelihood of winning repossession in court should achieve equal rates of winning repossession across tenant race at the margin, holding fixed non-race characteristics and contract rent. For the proof of Proposition 1, see Appendix C.1.

Third, racial bias arises from the dependence of τ_i on $b^p(R_i)$ and $b^v(R_i)$. A landlord exhibits racial bias if $b^p(minority) \neq b^p(white)$ or $b^v(minority) \neq b^v(white)$. Holding fixed Z_i, racially biased beliefs or preferences about the probability of repossession or the payoff from repossession can generate racial differences in filing thresholds even if $\tilde{p}$ does not actually depend on R_i. A testable implication of racial bias is that landlords deviate from equal rates of winning repossession across race at the margin, holding fixed non-race characteristics and contract rent:

Proposition 2. If $\mathbb{E}[Y_i^*|X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = minority] \neq \mathbb{E}[Y_i^*|X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = white]$, then a landlord exhibits racial bias.

Racial bias against minority (white) tenants is the specific case where the expected repossession rate is lower for minority (white) tenants. For the proof of Proposition 2, see Appendix C.2. Propositions 1 and 2 constitute a marginal outcome test for racial bias in eviction filing which is consistent with Canay et al. (2020) and follows the same intuition of outcome-based tests for racial bias conducted in other settings (Knowles et al. 2001; Persico and Todd 2006; Alesina and La Ferrara 2014; Anwar and Fang 2015; Arnold et al. 2018; Marx 2021; Dobbie et al. 2021; Baron et al. 2023).[16]

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[16]Propositions 1 and 2 are a stricter version of the marginal outcome test in Hull (2021) which allows bias to arise via non-race characteristics.

5 Empirical Approach

I next describe my empirical test for total racial discrimination in eviction filing. I return to the question of which sources of total discrimination landlords exhibit in Section 7. For a single landlord, total discrimination at contract rent y is:

$$\mathbb{E}[\tau_i|Y_i^0 = y, R_i = minority] - \mathbb{E}[\tau_i|Y_i^0 = y, R_i = white] \tag{6}$$

No discrimination is the case in which Equation 6 is zero. Total discrimination against minority (white) tenants is the case where Equation 6 is negative (positive).

To estimate Equation 6, I leverage the notion that tenants gradually accrue back rent until back rent reaches their landlords' eviction filing threshold. I observe the amount of back rent tenants owe upon crossing this threshold, which is the time the landlord files an eviction case. I denote this observable value $X_i(t^*)$, where $t^* = \min(t)$ such that $D_i(t) = 1$. My empirical approach utilizes observable racial differences in $X_i(t^*)$ to estimate racial differences in τ_i, conditional on landlord and contract rent.

To build intuition for this approach, suppose that back rent evolves continuously over time. Continuous $X_i(t)$ implies that back rent owed at the time of an eviction filing is exactly the landlord's threshold: $X_i(t^*) = \tau_i$. Therefore, total discrimination for a particular landlord at contract rent y is:

$$\mathbb{E}[X_i(t^*)|Y_i^0 = y, R_i = minority] - \mathbb{E}[X_i(t^*)|Y_i^0 = y, R_i = white] \tag{7}$$

In reality, back rent may evolve discretely over time $t \in \{0, 1, 2, 3, ...\}$. Discrete changes in back rent, however, are bounded due to the monthly payment schedule of rent. Tenant i cannot owe more than one additional month of contract rent than in the previous month:

$$X_i(t) \leq X_i(t-1) + Y_i^0 \tag{8}$$

This implies that discrete changes in back rent may place back rent owed at time t^* above the landlord's threshold, but the distance above is bounded by the value of contract rent:

$$X_i(t^*) \in \left[\tau_i, \tau_i + Y_i^0\right) \tag{9}$$

Under the assumption that back rent owed at filing exceeds the threshold by the same amount across white and minority tenants who have the same landlord and contract rent, total discrimination in the discrete case is identical to the continuous case (Equation 7).

Formally, this assumption is as follows for tenants of a single landlord with contract rent y:

$$\mathbb{E}[X_i(t^*) - \tau_i|Y_i^0 = y, R_i = minority] = \mathbb{E}[X_i(t^*) - \tau_i|Y_i^0 = y, R_i = white] \qquad (10)$$

In essence, this assumption imposes that white and minority tenants overshoot their landlord's filing threshold by the same amount on average. From this assumption, it follows that any racial differences in back rent equate to racial differences in thresholds conditional on landlord and contract rent. The assumption would only be violated if the size of the last discrete change in back rent before the filing is statistically different by race among tenants with the same landlord and contract rent. See Appendix D for a discussion of bias if this assumption is violated.

To implement the racial discrimination test, I estimate the following specification for eviction filings caused only by non-payment of rent against tenant(s) i by landlord j on filing date t:

$$Ln(Back\ Rent)_{ijt} = \beta Minority_i + \alpha_{j,y(ijt)} + \varepsilon_{ijt} \qquad (11)$$

Back Rent is the dollars owed in back rent at the time of the eviction filing. *Minority* is an indicator equal to one if a tenant's imputed race is non-white. I include landlord-by-contract rent fixed effects, $\alpha_{j,y(ijt)}$, to compare back rent owed by tenants with the same landlord j and contract rent y. I cluster standard errors at the landlord level. A negative estimate of β is evidence of discrimination against minority tenants. It is important to note that β is only identified for all j, y such that $Filings_{j,y,white} > 0$ and $Filings_{j,y,minority} > 0$. As such, β reflects average discrimination among this selected sample.

6 Discrimination Results

6.1 Main Results

In Table 3, I present the results of estimating Equation 11. Column 1 reports the raw racial disparity in back rent owed at the time of eviction filings, and column 2 estimates the disparity that is attributed to racial discrimination. The racial discrimination estimate is interpreted as minority tenants owing 4.5% less back rent than white tenants with the same landlord and contract rent at the time of a filing. This is evidence that landlords discriminate by using 4.5% lower filing thresholds for minority tenants. Comparing columns 1 and 2, discrimination explains about 9% of the raw racial disparity in back rent owed at filing. The difference between the coefficients reflects tenants sorting to landlords and contract rents differently by race. Some of this sorting may reflect earlier discrimination that occurs

Table 3: Racial Discrimination Results

	Log Back Rent	
	(1)	(2)
Minority Tenant	-0.4856*	-0.0451***
	(0.2633)	(0.0121)
Observations	151,357	116,927
R^2	0.0265	0.6116
Mean White Back Rent	1,779.50	1,612.96
Landlord × Contract Rent FE		✓

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 11. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Contract rent fixed effects refer to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

when landlords consider rental applications (Hanson and Hawley 2011; Ewens et al. 2014; Christensen et al. 2021). This means that the discrimination coefficient reported in column 2 isolates discrimination in eviction filing from any earlier housing market discrimination, providing evidence that racial discrimination persists beyond entry into rental housing.

The magnitude of the racial discrimination estimate is economically meaningful. Landlords using 4.5% lower filing thresholds for minority tenants equates to tolerating $133 fewer dollars of back rent or 0.18 fewer months of back rent from minority tenants (Table A1). To better appreciate the magnitude, I investigate how many minority eviction filings occur too soon due to discrimination. I simulate a non-discriminatory threshold for minority tenants equal to the mean back rent owed at filing among white tenants with the same landlord and contract rent.[17] Among minority eviction filings in Philadelphia, 24.14% or 2,306 filings per year have lower back rent than the simulated threshold, meaning that they occur too soon. Whether these tenants would fall further behind and still receive a filing at the higher, non-discriminatory threshold requires an assumption about how many minority tenants would catch up on rent or not fall further behind. In other settings, even small amounts of credit can reduce eviction filings (Lodermeier 2023), suggesting that informal credit from landlords raising minority thresholds by 4.5% or $133 may allow a substantial share of minority tenants to avoid a filing entirely.

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[17]Note that I can only simulate this threshold for minority tenants with a white tenant in the same landlord-by-contract rent cell meaning that these simulations under count minority filings occurring too soon.

6.2   Robustness Checks

Concerns about the discrimination estimate may arise due to the possibility of unobserved lease violations, tenant race being imputed rather than observed, other ways landlords may measure non-payment of rent, the selected sample of landlords that identify discrimination, or any violation of the identifying assumption (Equation 10). To address these concerns, I first demonstrate robustness to incorporating other components of the amount claimed by the landlord, alternative methods of imputing tenant race, and allowing non-payment thresholds to be measured in back rent relative to tenure in the property. I then provide suggestive evidence that the discrimination estimate if anything understates average discrimination due to the selected sample of large landlords required for identification. Lastly, I consider the magnitude of any bias from different accrual of back rent across race and validate that the main results cannot be explained by any such bias.

6.2.1   Omitted Lease Violations

By focusing on eviction cases caused only by non-payment of rent, back rent owed at the time of filing should fully capture how qualified a tenant is for an eviction filing. In Table 2, however, some landlords that indicate the cause of the filing to be only non-payment also claim physical damages later in the filing. This may indicate some unobserved lease violations in the sample of cases appearing to be caused only by non-payment of rent. To ensure unobserved lease violations are not biasing my estimate of total discrimination, I further restrict the sample to cases caused only by non-payment of rent with $0 of physical damages or other fees claimed in the filing. Estimates of total discrimination are robust to using this further restricted sample (column 1 of Table A3). I also find similar evidence of discrimination when comparing the sum of back rent and late fees owed at filing in this sample (column 2 of Table A3).

Conditional on the true cause(s) of an eviction filing, if landlords differentially indicate non-rent causes by tenant race, then the main discrimination estimates from the restricted sample of cases caused only by non-payment of rent may compare white and minority tenants who are differentially selected into this sample. This problem appears unlikely given that both the full and restricted sample of cases are composed of 87.6% minority filings (Table 2). Nonetheless, broadening the analysis sample of eviction cases to include all causes of eviction avoids this selection bias from differential reporting of non-rent causes of eviction. Given that I observe physical damages, late fees, and other fees in addition to back rent owed at the time of the filing, I construct a broader measure of tenant qualification for an eviction filing that applies to all causes of eviction. I call this qualification measure the adjusted

claim amount, which is meant to monetarily capture all lease violations for which the tenant is responsible—back rent, late fees, physical damages, other fees.[18] I demonstrate that the finding of racial discrimination is robust to using cases filed for any reason and comparing the adjusted claim amount across race conditional on landlord and contract rent (column 3 of Table A3).[19]

6.2.2   Race Imputation

Evidence of racial discrimination in eviction filing is robust to using various methods of imputing tenant race. I first vary the race imputation cutoff used to define tenant race in columns 1 through 4 of Table A2 and find significant evidence of discrimination across different cutoffs. I next impute race using city as the geolocation level instead of census block.[20] The entire analysis sample is located in Philadelphia, so this approach utilizes no geographic variation across tenants and simply incorporates priors based on the racial composition of Philadelphia. I find that even without relying on geographic variation, I detect significant racial discrimination in eviction filing (column 5 of Table A2). Lastly, evidence of discrimination is robust to using a linear estimator for discrimination based on the continuous imputed probability that any tenant named on the filing belongs to a racial minority group (column 6 of Table A2).

6.2.3   Measuring Non-Payment of Rent

The discrimination test allows for equal thresholds across race measured in either dollars or months of back rent to be considered non-discriminatory behavior. However, an additional unit of measure to consider for thresholds of non-payment is the ratio of back rent to a tenant's tenure in the rental property.[21] For example, a landlord may make different filing

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[18]When constructing the adjusted claim amount, I remove attorney fees from the full claim amount since a landlord's attorney fees do not reflect any tenant behavior in violation of the lease agreement that qualifies the tenant for the eviction filing.

[19]Note that this alternate approach using the adjusted claim amount requires the identifying assumption that the combined value of back rent, physical damages, and other fees owed to the landlord accrued either continuously over time or in similarly discrete way for white and minority tenants with the same landlord and contract rent.

[20]Incorporating granular geolocation greatly increases the accuracy of race imputations which is why my preferred method uses census blocks (Imai and Khanna 2016).

[21]Note that this ratio introduces a linear assumption about the accrual of back rent over time. This may be unrealistic if, for instance, tenants pay rent on time for some period of time and only begin to fall behind after an income shock. Since I do not observe the path of back rent prior to the filing, I cannot examine the validity of the linear assumption. To the extent that back rent indeed accrues non-linearly but at a similar rate among white and minority tenants with the same landlord and contract rent, then the main discrimination results in Table 3 already allow for non-discriminatory landlords to measure non-payment by the ratio of back rent to the time of accrual.

decisions for a new tenant who failed to pay their first rental payment and a longstanding tenant who gradually accrued an equivalent amount of back rent. One could argue that this form of selective eviction filing behavior is non-discriminatory if it is reasonable for a landlord to measure non-payment of rent in terms of back rent relative to tenure. I allow for landlords to utilize this additional measure of non-payment by including landlord-by-contract rent-by-tenure fixed effects in the discrimination test specification. Table A4 demonstrates that the finding of racial discrimination is robust to additionally allowing equal thresholds of back rent divided by tenure to be considered non-discriminatory behavior.

6.2.4 Selected Sample of Landlords Identifying Discrimination

Identification of discrimination requires landlords to have filed multiple eviction cases against tenants with the same contract rent that belong to different racial groups. The effective sample that identifies discrimination is actually smaller than the 116,927 filings reported in column 4 of Table 3.[22] Since my discrimination estimate is only representative of the effective sample, it may not reflect average discrimination in Philadelphia. I argue that if anything my estimate understates average discrimination because the effective sample is likely more representative of larger or corporate landlords who may have more objective eviction filing criteria and be less likely to exhibit discrimination. Consistent with this notion, the raw, within-landlord, and within-contract rent racial disparities in back rent owed at filing are smaller in the effective sample than the full sample of landlords filing eviction cases in Philadelphia (Table A5).

6.2.5 Discrete Back Rent Assumption

The identifying assumption of the discrimination test requires that the amount by which back rent exceeds the landlord's threshold at the time of filing is race-invariant conditional on landlord and contract rent (Equation 10). If instead the last discrete change in back rent prior to the filing is statistically smaller for minority tenants, then white tenants' back rent would be further above the landlord's threshold at the time of the filing than that owed by minority tenants. This would negatively bias my estimate of discrimination. In Appendix D, I demonstrate that while minority tenants appear to have slightly smaller discrete changes

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[22]The sample size reported in column 2 of Table 3 excludes singleton filings in landlord-by-contract rent cells. However, some cells with multiple filings that are found in the estimation sample only include a single race and thus do not contribute to the racial discrimination estimate. The effective sample that can identify discrimination is composed of 70,898 filings by 358 unique landlords. For comparison, the full analysis sample of filings caused only by non-payment of rent with at least 80% likely race imputations is composed of 151,357 filings by 19,358 unique landlords.

in back rent in the data, the magnitude could only explain up to 6% of my discrimination estimate.

6.3   Landlord-Specific Discrimination

The estimate of racial discrimination thus far reflects average discrimination. This could be driven by a small number of highly-discriminatory landlords or reflect widespread discrimination among Philadelphia landlords. To better understand the prevalence of discrimination in eviction filing, I estimate landlord-specific discrimination coefficients. To do so, I estimate an alternative version of Equation 11 that allows for the discrimination parameter to vary by landlord:

$$Ln(Back\ Rent)_{ijt} = \beta_j Minority_i + \alpha_{j,y(ijt)} + \varepsilon_{ijt} \tag{12}$$

Estimates of β_j, however, are most informative for landlords with a sufficient number of filings against white and minority tenants with the same contract rent. Therefore, I adopt two different approaches to address this concern when estimating β_j coefficients.

First, I restrict to a sample of cases that are found in landlord-by-contract rent cells with at least two non-payment of rent filings against white tenants and two against minority tenants. Due to the small size of many landlord-by-contract rent cells, this method can only identify landlord-specific discrimination coefficients for 84 unique landlords.[23] As a second approach, I do not impose this additional sample restriction and instead estimate β_j parameters from a regression with landlord and contract rent fixed effects included separately instead of interacted.[24] This second approach allows me to estimate β_j coefficients for 1,078 unique landlords.

I plot the distributions of these landlord-specific discrimination coefficients in Figure 2. The median $\hat{\beta}_j$ under landlord-by-contract rent fixed effects is -0.0259, and the median $\hat{\beta}_j$ under landlord and contract rent fixed effects is -0.0334. This suggests that the median landlord exhibits discrimination in eviction filing. From Figure 2, however, it remains unclear what share of landlords exhibit discrimination. The standard errors of each individual β_j estimated by Equation 12 are quite imprecise due to the often small number of eviction cases filed by a single landlord.[25]

To account for noise in the $\hat{\beta}_j$s and estimate the share of landlords exhibiting racial discrimination ($\beta_j < 0$), I follow Goncalves and Mello (2021) by modeling the estimation

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[23]These 84 landlords, however, are responsible for 59% of the eviction filings in my analysis sample.

[24]Note that the discrimination coefficient estimated from including these fixed effects separately is -0.0325 compared to my main estimate of -0.0451.

[25]The means of the standard errors of the $\hat{\beta}_j$ estimates plotted in Figures 2a and 2b are 0.23 and 0.19, respectively.

Figure 2: Landlord-Specific Discrimination Estimates

(a) Landlord × Contract Rent FE

(b) Landlord + Contract Rent FE
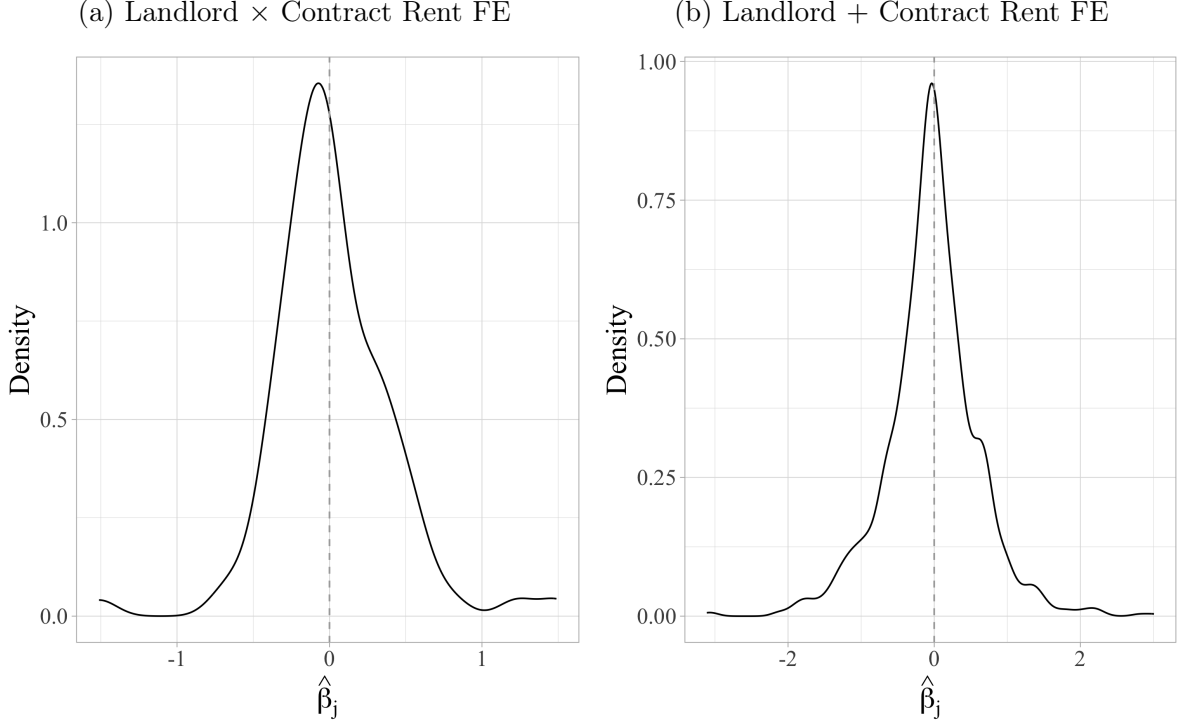
This figure plots the distribution of landlord-specific discrimination coefficients. The outcome variable from the regression generating the coefficients is log back rent. The estimates in subfigure (a) are controlled for landlord-by-contract rent fixed effects and use a sample of Philadelphia non-payment of rent cases found in landlord-by-contract rent cells with at least two non-payment of rent filings against white tenants and two against minority tenants. The estimates in subfigure (b) are controlled for landlord and contract rent fixed effects separately and use the full analysis sample of Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations.

error in $\hat{\beta}_j$ as normal with variances taken from the estimated standard errors. I then estimate the true distribution of landlord discrimination by maximum likelihood. From the estimates using landlord-by-contract rent fixed effects (Figure 2a), I estimate that 73.45% of Philadelphia landlords discriminate against minority tenants with a standard error of 18.43 percentage points. From the estimates using the less restrictive approach of landlord and contract rent fixed effects separately (Figure 2b), I estimate that 49.09% of Philadelphia landlords discriminate against minority tenants with a standard error of 2.73 percentage points. In both cases, I find that a higher share of landlords discriminate against minority tenants than reverse discriminate against white tenants.[26]

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[26]From the Figure 2a approach, I estimate that 26.55% of landlords discriminate against white tenants with a standard error of 15.21 percentage points., From the Figure 2b approach, I estimate that 42.59% of landlords discriminate against white tenants with a standard error of 2.73 percentage points.

6.4 Heterogeneity

I also explore heterogeneity by neighborhood, landlord, and tenant characteristics to understand which tenants are most vulnerable to discrimination in eviction filing. Figure 3 illustrates that minority tenants living in majority-white neighborhoods experience more racial discrimination than minority tenants living in majority-minority neighborhoods.[27] These estimates are relative to white tenants with the same landlord and contract rent that live in census tracts with similar racial compositions. This pattern aligns with evidence from Hanson and Hawley (2011) that housing discrimination at entry is most severe in neighborhoods with a minority share between 5% and 20%, which corresponds to the tipping point range for white population outflows described in Card et al. (2008).

Landlord characteristics are also associated with heterogeneous patterns of racial discrimination. Figure 4 plots estimates of racial discrimination separately for corporate landlords, white and minority non-corporate landlords, and other uncategorized landlords. Note that these landlord classifications are imputed.[28] I find that racial discrimination in eviction filing appears to be concentrated among non-corporate, white landlords and can reject joint equality of the heterogeneous discrimination coefficients (p-value = 0.006). This is consistent with corporate landlords having more objective eviction filing criteria than non-corporate landlords.

Examining individual tenant characteristics, I find no evidence of heterogeneous discrimination by gender (Figure A2) or contract rent (Figure A3). I also find little evidence of heterogeneity by tenure in the rental property (Figure A4). Figure A5 illustrates that discrimination may be most severe among tenants with lower rent burden—defined as contract rent relative the median household income among renters in the census tract—but occurs across the rent burden distribution.[29]

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[27]From an F-test of joint equality of the heterogeneous discrimination coefficients, I can reject equal discrimination patterns across neighborhood compositions (p-value < 0.0001).

[28]I classify a landlord as corporate if its name contains "LLC", "LP", "LTD", "INC", or similar strings indicative of corporate landlords. For the remaining private landlords, I impute their race using the fBISG methodology given their first name, last name, and city of residence if located in Pennsylvania. I use a 50% cutoff for classifying a non-corporate landlord as belonging to a racial group. Note that this is lower than the cutoff used for tenant race imputations and is meant to minimize unknown landlord classifications in the heterogeneity analysis. 16% of landlords are classified as corporate, 30% as white, 43% as minority, and 10% as other or unknown.

[29]Median household income data comes from 5-year American Community Survey (ACS) estimates. To assign this proxy measure of income to tenants in eviction filings, I match the midpoint of the 5-year ACS period to the case filing year. It is important to note that this proxy measure of rent burden does not account for any within-tract variation in income which may lead to underestimated rent burden for minority tenants relative to white tenants in the same neighborhood.

Figure 3: Racial Discrimination by Racial Composition of Census Tract
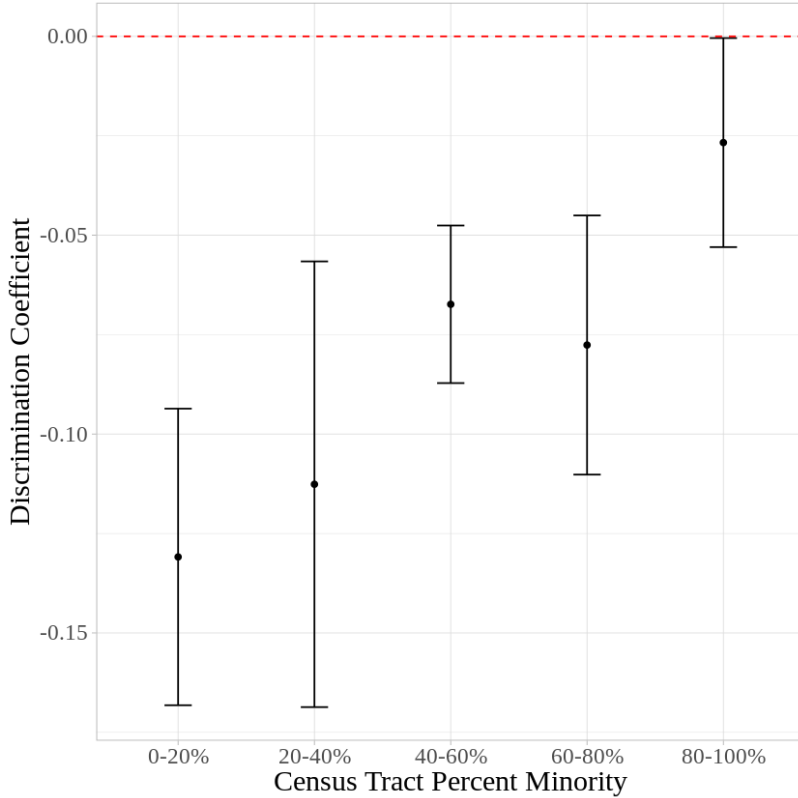
This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by racial composition of the census tract. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects interacted with the racial composition bins. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.

7 Sources of Discrimination

7.1 Direct vs. Indirect Discrimination

Having found evidence of racial discrimination in eviction filing, I next turn to examine the possible sources of discrimination. If indirect discrimination alone explains discrimination, then filing thresholds should be equivalent across race holding fixed non-race characteristics Z_i among tenants with the same landlord and contract rent (Equation 5). Rejecting equal thresholds conditional on Z_i is evidence of direct discrimination on the basis of tenant race. I do not observe the full vector of non-race tenant characteristics Z_i observable to the landlord but test for direct discrimination by controlling for the subset of Z_i in the data.

Table 4 provides evidence of direct discrimination. For comparison, column 1 is the pre-

Figure 4: Racial Discrimination by Landlord Type
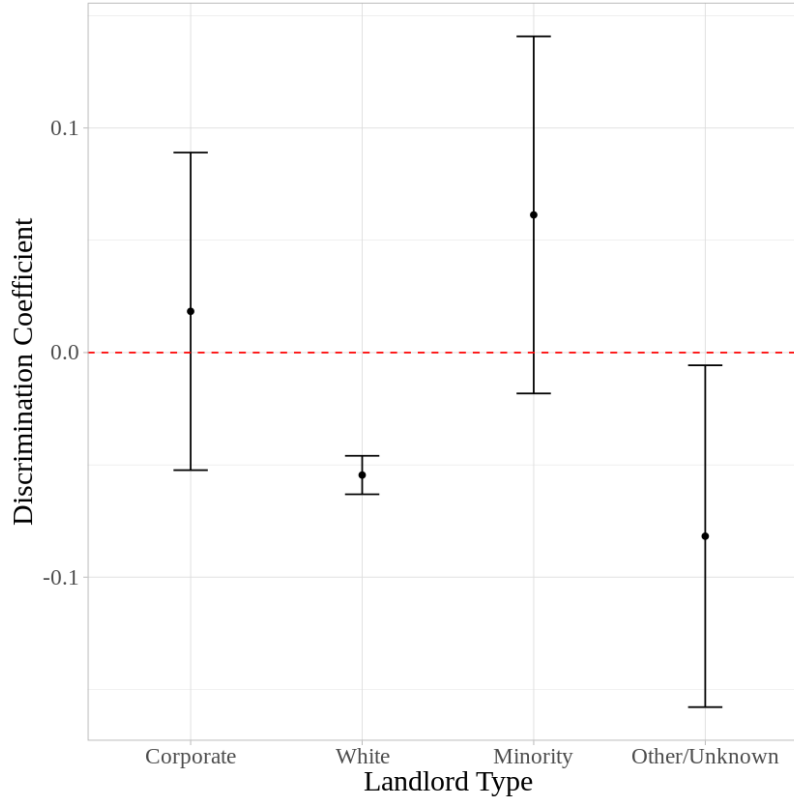
This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by landlord type. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.

vious estimate of total racial discrimination. Column 2 is the estimate of total discrimination on a restricted sample of filings for which I observe tenant demographic variables. Columns 3 and 4 estimate direct discrimination by including controls for gender, the number of tenants in the property, a proxy measure of rent burden, and census tract fixed effects. Controlling for these observable tenant characteristics does not substantially change the discrimination coefficient and if anything, shifts the estimate away from zero. The same finding holds in Table A6 when including additional controls for a tenant's tenure in the rental property, which can only be observed for 67% of eviction cases. I cannot reject that the uncontrolled and controlled estimates are the same, which is consistent with total discrimination entirely reflecting direct discrimination.

To the extent that landlords selectively file eviction cases according to other tenant characteristics not captured here, the estimates of direct discrimination in columns 3 and 4

Table 4: Direct vs. Indirect Discrimination

	Log Back Rent			
	(1)	(2)	(3)	(4)
Minority Tenant	-0.0451***	-0.0449***	-0.0506***	-0.0464***
	(0.0121)	(0.0112)	(0.0153)	(0.0128)
Observations	116,927	93,406	93,406	93,406
R^2	0.6116	0.6203	0.6216	0.6388
Mean White Back Rent	1,612.96	1,615.37	1,615.37	1,615.37
Landlord × Contract Rent FE	✓	✓	✓	✓
Tenant Controls			✓	✓
Census Tract FE				✓
Non-missing Controls Sample		✓	✓	✓
$\beta = \beta_{Col.2}$ *p-value*	0.9904		0.7656	0.9284

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 11 with controls. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Column 1 restates the estimate of total discrimination from Table 3. Column 2 uses a restricted sample of filings with observable tenant demographic variables. Columns 3 and 4 introduce control variables. Tenant controls include the imputed gender of first tenant named, fixed effects for the number of tenants in the property listed on the filing, and rent burden fixed effects (2-percentage point bins). Rent burden is constructed as the ratio of contract rent to median household income among renters in the census tract. Contract rent fixed effects refer to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

of Table 4 could include omitted variable bias. In particular, income could be an omitted variable that the landlord may take into consideration when filing eviction cases if income predicts a tenant's ability to catch up on rent in the future and thus the landlord's payoff from eviction. This does not appear to be a substantial issue for a number of reasons. First, the inclusion of census tract fixed effects in column 4 should account for much of the unobserved variation in tenant characteristics such as income. Second, the magnitude of the discrimination coefficient increases after controlling for tenant observables that are proxies for income. This suggests that any remaining indirect discrimination from unobserved tenant characteristics would likely move in the same direction and that the magnitude of direct discrimination in column 4 is, if anything, an underestimate. Third, I implement the approach in Oster (2019) to estimate bias-adjusted coefficients for direct discrimination. Assuming that controlling for any remaining unobservables would add as much to the R^2 as the observables, I estimate a bias-adjusted estimate of direct discrimination of -0.0509 which falls within the 95% confidence interval of both the total and direct discrimination estimates.[30]

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[30] When implementing this method, I compare the uncontrolled and controlled estimates in columns 2 and

Overall, the results in Table 4 suggest limited scope for indirect discrimination. Racial discrimination in eviction filing appears to entirely reflect landlords discriminating directly on the basis of tenant race. This provides stronger evidence that landlord discrimination in eviction filing is in violation of the Fair Housing Act.[31]

7.2 Accurate Statistical Discrimination vs. Racial Bias

Direct racial discrimination exhibited by landlords may reflect accurate statistical discrimination or racial bias. From Section 4.2, accurate statistical discrimination may arise if landlords account for any true dependence of the probability of winning repossession on tenant race. Alternatively, landlords may exhibit racial bias against minority tenants if they deviate from accurate statistical discrimination and tolerate different true payoffs from filing eviction cases by tenant race.

In practice, winning repossession appears to depend on tenant race, motivating the possibility of accurate statistical discrimination. Landlords tend to win repossession—measured by filing for a writ of possession—in cases against minority tenants at a higher rate than cases against white tenants, conditional on back rent owed at the time of the filing (Figure 5). This pattern could be driven by a number of potential explanations, including racial differences in any of the following: the landlord withdrawing the case prior to the hearing date, the tenant appearing in court, access to legal representation, information on court processes, landlord-tenant negotiations that happen in court, or treatment by judges or court staff. Regardless of the explanation for the racial disparity in Figure 5, if landlords account for this observable pattern that it seemingly requires less back rent to win repossession from minority tenants, then accurate statistical discrimination may explain discrimination in eviction filing.

A testable implication of accurate statistical discrimination is that a landlord should win repossession of the property at the same rate against a white and minority tenant at the margin conditional on non-race characteristics and contract rent (Proposition 1). Any deviation from equal repossession rates reflects racial bias (Proposition 2). In practice, I do not observe all possible non-race characteristics that the landlord may observe and thus conduct the marginal outcome test controlling for the same observable tenant characteristics as in Section 7.1. I conduct this marginal outcome test using the following specification for

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4 and set $R^2_{max} = R^2_{Col.2} + (R^2_{Col.4} - R^2_{Col.2})$.

[31]From Section 2.1, total racial discrimination in eviction filing estimated in Section 6 violates the Fair Housing Act under the assumption that there exists no legitimate interest for a landlord to selectively file non-payment of rent eviction cases against tenants equally behind on rent. If this assumption is violated, then only direct discrimination would necessarily equate to a violation of the Fair Housing Act.

Figure 5: Racial Differences in Writ of Possession
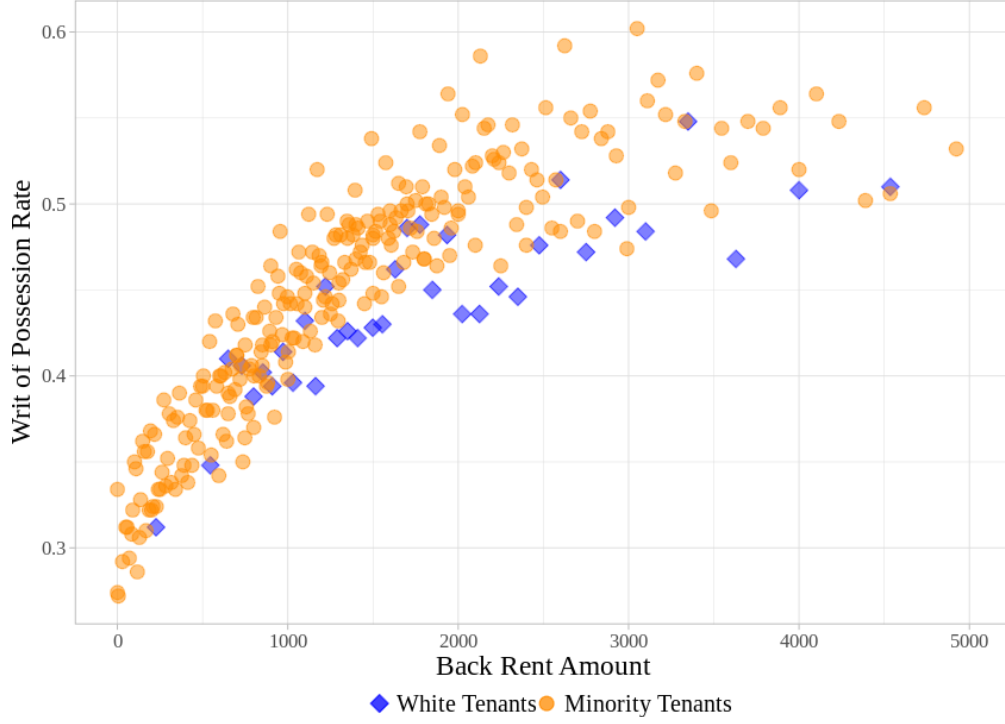
This figure plots a bin scatter of the relationship between back rent and landlords filing for a writ of possession. Each point reflects 500 eviction cases by tenants belonging to a given racial group. The x-axis is the median back rent among cases in each cell. The y-axis is the rate of landlords winning repossession among cases in the cell.

filings against tenant(s) i by landlord j on filing date t:

$$Repossession_{ijt} = \theta Minority_i + \gamma_{j,y(ijt)} + X'_{ijt}\lambda + \upsilon_{ijt} \qquad (13)$$

An estimate of $\theta \neq 0$ is evidence of racial bias under two assumptions: marginal outcomes and no omitted payoff bias (Hull 2021; Kleinberg et al. 2018).[32] First, the test requires that all outcomes are marginal. This assumption is satisfied if back rent evolves continuously, ensuring that back rent owed at filing is equal to the landlord's filing threshold for tenant i. Second, no omitted payoff bias requires that a landlord's true payoff from winning reposses-sion does not vary with tenant race after including landlord-by-contract rent fixed effects, $\gamma_{j,y(ijt)}$, and control variables, X_{ijt}, which include imputed gender, the number of tenants in the property, a proxy measure of rent burden, and census tract fixed effects. The inclusion of rent burden and census tract fixed effects, in particular, should limit concerns about omitted

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[32]A negative estimate of θ implies racial bias against minority tenants, while a positive estimate of θ implies racial bias against white tenants.

payoff bias as they proxy for the true likelihood of future payment by tenant i.

The marginal outcome test also depends on accurately measuring the outcome—the landlord winning repossession of the rental property from the tenant during the court process. My preferred measure for *Repossession* is whether the landlord filed for a writ of possession. This measure aligns with the definition of an eviction order used by Collinson et al. (2022) in New York City eviction cases. One drawback of this measure, however, is that it may miss informal repossessions. For example, a landlord may not file for a writ of possession after winning a judgment if the tenant has already vacated the property. In the data, a substantial number of cases with a judgment in favor of the landlord have no writ of possession filed (Figure A6), suggesting that the writ of possession measure may indeed underestimate repossession. On the other hand, a favorable judgment for the landlord and no writ of possession filed could also indicate no repossession if the landlord and tenant were able to privately reach an agreement that allowed the tenant to remain in the property.

If unobserved repossessions vary by race, this represents another form of omitted payoff bias. To address this, I repeat the marginal outcome test using two broader measures of repossession. First, I define *Repossession* to include cases resulting in a writ of possession or a JBA in which the tenant agrees to vacate or already vacated the property. Second, I additionally include any case resulting in a judgment for the landlord regardless of whether a writ of possession was filed. While each of these measures of repossession has drawbacks, consistent results across these measures should support the interpretation of the outcome test.

Table 5 reports the results of the marginal outcome test. In general, I cannot reject that landlords' repossession rates are equal across tenant race. This is consistent with accurate statistical discrimination. I investigate any remaining concerns about omitted payoff bias in Tables A7 and A8. If a tenant's tenure in the property varies by race and predicts future payment, omitted payoff bias could affect the marginal outcome test results. The Table 5 results are generally robust to including additional controls for tenure in the rental property (Table A7). Another form of omitted payoff bias could arise if the amount of back rent a tenant owes at the time of the filing predicts future payment. To address this concern, I demonstrate that the marginal outcome test results are robust to using as outcomes the repossession measures scaled by the log value of back rent owed at filing (Table A8).

Next, I benchmark the results from the marginal outcome test against the underlying racial disparity in winning repossession if landlords were to exhibit no discrimination at filing. In essence, this underlying racial disparity more precisely estimates the racial differences in court-ordered repossession suggested by Figure 5. Table 6 estimates racial disparities in repossession among tenants with the same landlord, contract rent, and similar amounts

Table 5: Marginal Outcome Test Results

	Writ of Possession		or Agree to Leave via JBA		or Landlord Won Judgment	
	(1)	(2)	(3)	(4)	(5)	(6)
Minority Tenant	0.0077	0.0004	0.0150*	0.0061	-0.0044	-0.0045
	(0.0084)	(0.0100)	(0.0077)	(0.0111)	(0.0063)	(0.0081)
Observations	117,880	94,153	117,880	94,153	117,880	94,153
R^2	0.1291	0.1473	0.1366	0.1558	0.1678	0.1851
White Outcome Mean	0.4410	0.4438	0.4832	0.4853	0.6573	0.6558
Landlord × Contract Rent FE	✓	✓	✓	✓	✓	✓
Tenant Controls		✓		✓		✓
Census Tract FE		✓		✓		✓

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 13. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Contract rent fixed effects refer to the exact dollar value of contract rent. Tenant controls include imputed gender of the first tenant named in the filing, fixed effects for the number of tenants named, and rent burden fixed effects (2 percentage point bins of the ratio of contract rent to median household income among renters in the census tract). The outcome variable in columns 1 and 2 is an indicator for whether a landlord filed for a writ of possession. The outcome variable in columns 3 and 4 is an indicator for whether the landlord filed for a writ of possession or the tenant agreed to vacate the property as part of a judgment by agreement (JBA). The outcome variable in columns 5 and 6 is an indicator for whether the landlord filed for a writ of possession, the tenant agreed to vacate the property via a JBA, or the landlord won a default judgment or won a contested judgment (decided by the judge) regardless of filing for a writ of possession. Standard errors are clustered at the landlord level.

of back rent owed at filing. The magnitudes of these racial disparities if landlords were to exhibit no discrimination at filing (Table 6) are consistently larger than the magnitudes after accounting for racial discrimination at filing (Table 5). This pattern provides additional support for the interpretation of accurate statistical discrimination. By filing eviction cases at lower thresholds of back rent for minority tenants, landlords appear to equalize the otherwise-unequal repossession rate. Consistent with this interpretation, racial discrimination and the underlying racial disparity in landlords winning repossession appear to co-vary over time. The underlying racial disparity in the repossession rate began to narrow around 2014-2015 (Figure A7) which was closely followed by a decline in racial discrimination in 2016-2017 (Figure A8).

Broadly, this finding is consistent with landlords accounting for racial disparities at later stages in their eviction filing decisions. I cannot diagnose whether the underlying racial disparity in landlords winning repossession arises from minority tenants facing unequal information about the eviction court process, access to legal representation, treatment by judges, or some other factor. Nonetheless, these findings imply that policy responses to eliminate any racial disparities in eviction court that affect the repossession rate should reduce racial discrimination by landlords at the margin of eviction filing. Further upstream,

Table 6: Benchmarking Outcome Test

	Writ of Possession	or Agree to Leave via JBA	or Landlord Won Judgment
	(1)	(2)	(3)
Minority Tenant	0.0108**	0.0212***	-0.0015
	(0.0055)	(0.0052)	(0.0040)
Observations	84,427	84,427	84,427
R^2	0.1947	0.2091	0.2451
White Outcome Mean	0.4542	0.4923	0.6742
Landlord $\times$ Contract Rent $\times$ Back Rent FE	✓	✓	✓

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Contract rent fixed effects refer to the exact dollar value of contract rent. Back rent fixed effects refer to back rent bins defined at $100 increments. The outcome variable in column 1 is an indicator for whether a landlord filed for a writ of possession. The outcome variable in column 2 is an indicator for whether the landlord filed for a writ of possession or the tenant agreed to vacate the property as part of a judgment by agreement (JBA). The outcome variable in column 3 is an indicator for whether the landlord filed for a writ of possession, the tenant agreed to vacate the property via a JBA, or the landlord won a default judgment or won a contested judgment (decided by the judge) regardless of filing for a writ of possession. Standard errors are clustered at the landlord level.

however, landlords could also change how they select tenants for rental units in response to reduced racial disparities in eviction court. With the data analyzed in this paper, I am unable to investigate this potential margin of adjustment, meaning that welfare implications of eliminating racial disparities in eviction court are unclear.

8 Conclusion

In this paper, I find evidence of racial discrimination against minority tenants in eviction filing. Landlords tolerate 4.5% less back rent from minority tenants than white tenants with the same contract rent when filing eviction cases. Between 49% and 73% of Philadelphia landlords in my sample exhibit racial discrimination, and minority renters living in majority-white neighborhoods are most vulnerable to discrimination. This racial discrimination appears to be fully driven by direct discrimination on the basis of race and not other characteristics, which potentially violates the Fair Housing Act.

Evidence of racial discrimination at the margin of housing loss reveals that minorities face significant discrimination in the housing market even after entry into housing. Racial discrimination in this context is particularly troubling given the severe consequences of eviction filings. Regardless of the case outcome, eviction filings generate a public record that is visible on tenant screening reports for seven years. Anecdotal evidence suggests this public

record restricts future access to quality housing (Goldstein 2021; Lake and Tupper 2021). Higher exposure to eviction filings may disproportionately expose minority tenants to the adverse effects of housing displacement (Collinson et al. 2022). Landlords tolerating less back rent from minority tenants equates to less informal credit from landlords, amplifying known racial disparities in formal credit access (Cohen-Cole 2011; Weller 2009).

I find suggestive evidence that racial discrimination in eviction filing is explained by landlords exhibiting accurate statistical discrimination. Landlords observe that winning repossession from minority tenants requires lower thresholds of back rent. By filing eviction cases at lower thresholds against minority tenants, landlords equalize the repossession rate. This finding implies that policy responses to reduce racial disparities in eviction court may also reduce racial discrimination at the earlier point of eviction filing by landlords.

Evaluating whether any recent eviction policies indeed reduce racial discrimination at filing remains an important direction for future work. For example, right-to-counsel laws for tenants in eviction court and eviction diversion programs could theoretically impact the scope for statistical discrimination by reducing racial gaps in the repossession rate. Other policies that directly regulate when landlords can file eviction cases—for example, "good cause" laws or back rent floors—may also reduce racial discrimination in eviction filing.

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Appendix A   Supplemental Figures and Tables

A.1   Supplemental Figures

Figure A1: Months of Back Rent Owed at Filing

(a) All Tenants   (b) Below Median Contract Rent
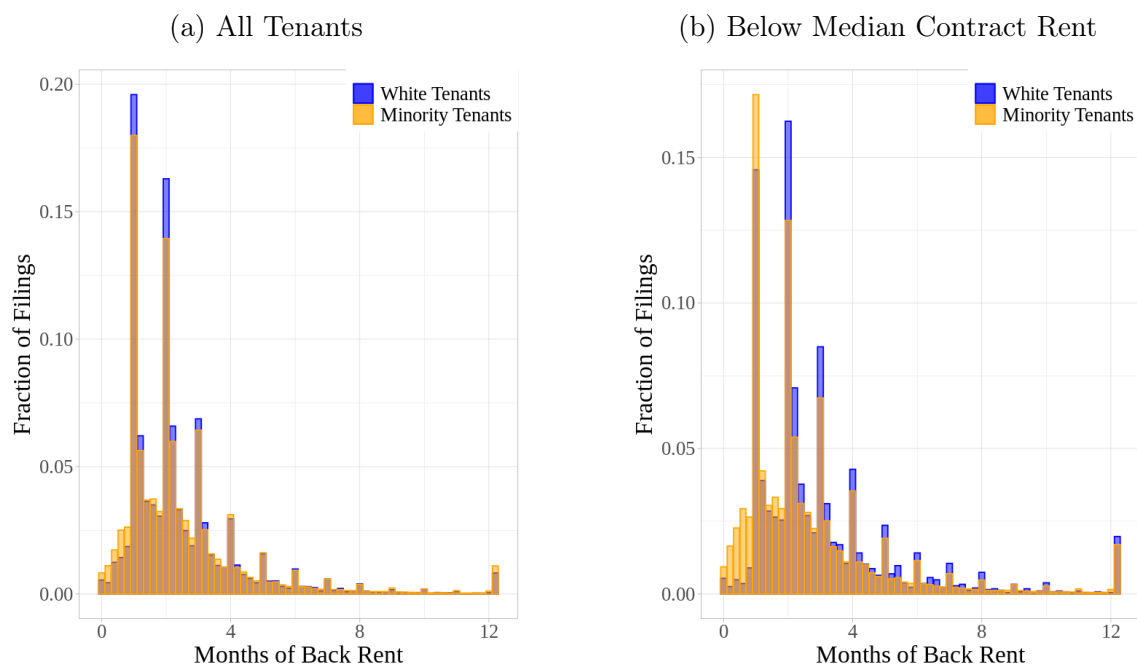

This figure plots the months of back rent distribution of Philadelphia eviction filings separately for filings against white and minority tenants. Months of back rent is equal to dollars of back rent divided by monthly contract rent. The sample in both subfigures restricts to filings cause only by non-payment of rent and excludes filings for which no tenant race could be imputed with at least 80% certainty. Subfigure (b) further restricts to tenants with contracts rents below the sample median in the year of the eviction filing.

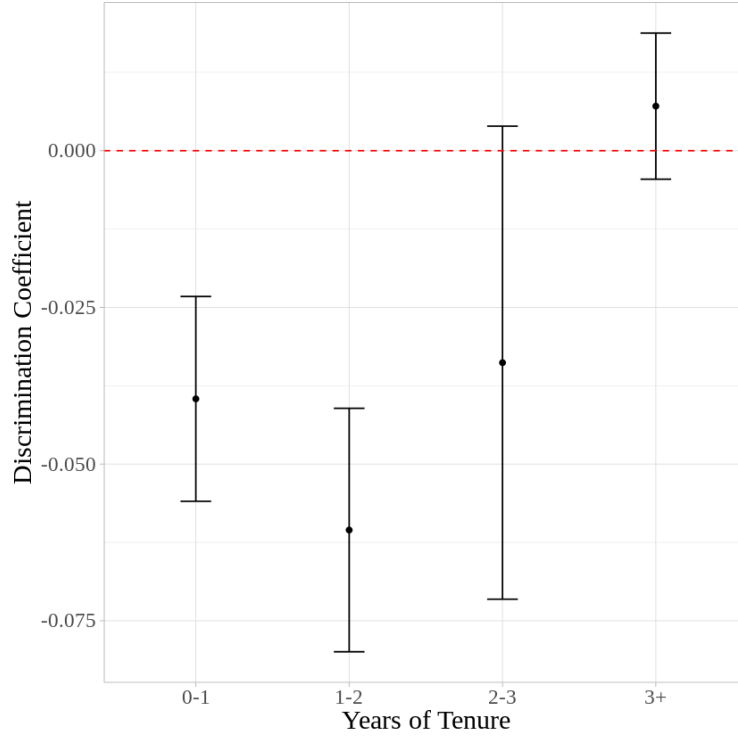Figure A2: Racial Discrimination by Imputed Gender
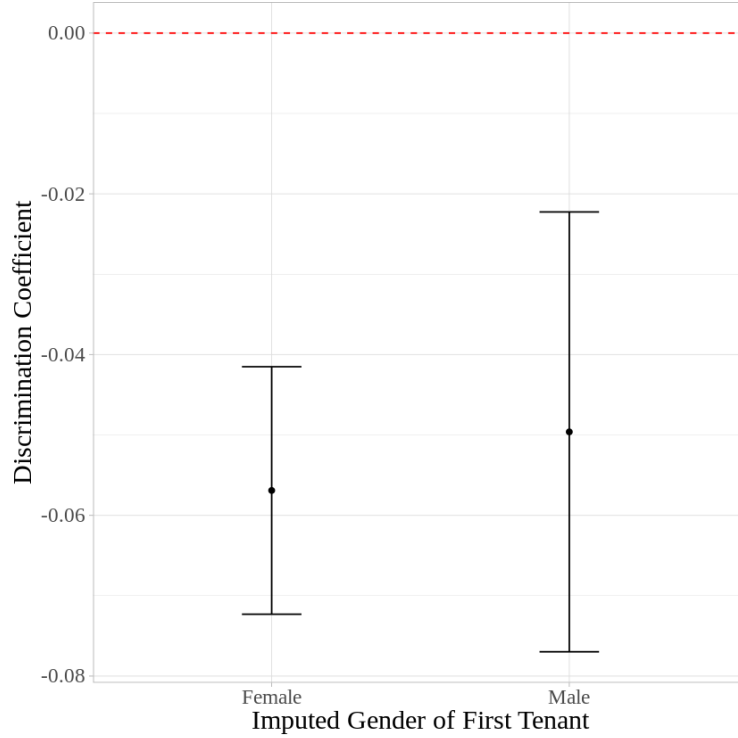
This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by imputed gender of the first tenant named in the filing. The gender imputation uses the tenant's first name. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects interacted with gender. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.

Figure A3: Racial Discrimination by Contract Rent
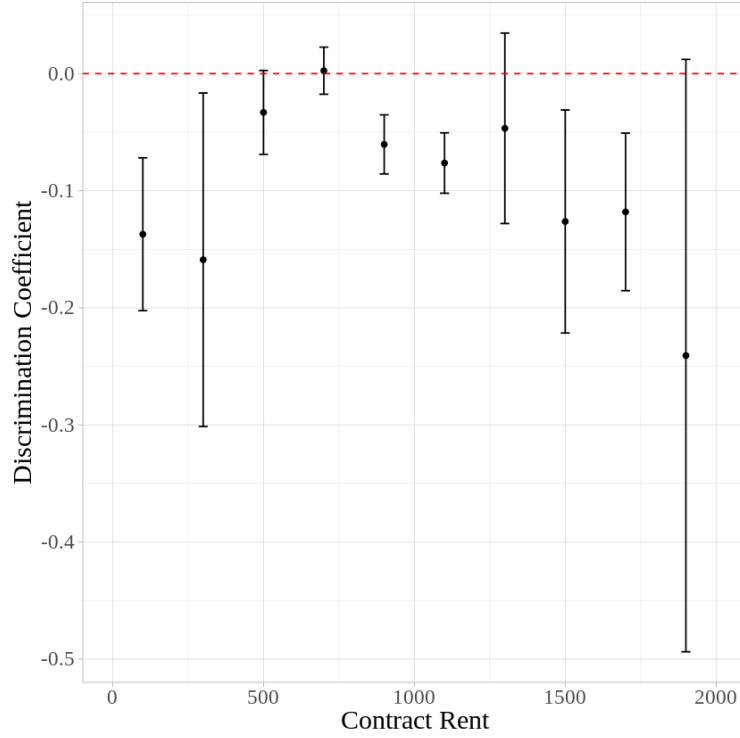
This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by $200 contract rent bins. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.

Figure A4: Racial Discrimination by Tenure

This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by the years the tenant has lived in the rental property prior to the eviction filing. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects interacted with the tenure bins. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.
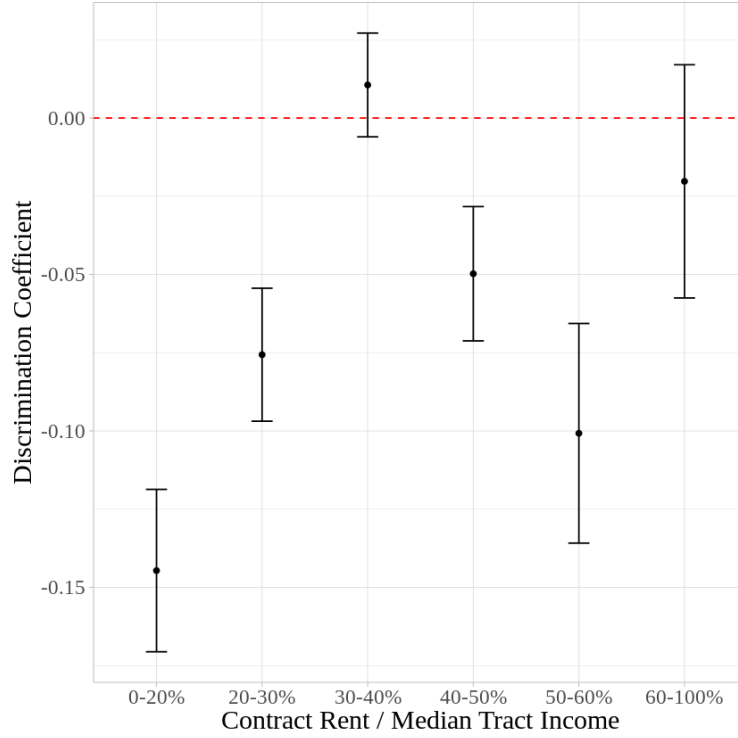
Figure A5: Racial Discrimination by Rent Burden

This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by tenant rent burden. Rent burden is defined as the ratio of contract rent to median income among renters in the census tract of the rental property. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects interacted with the rent burden bins. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.
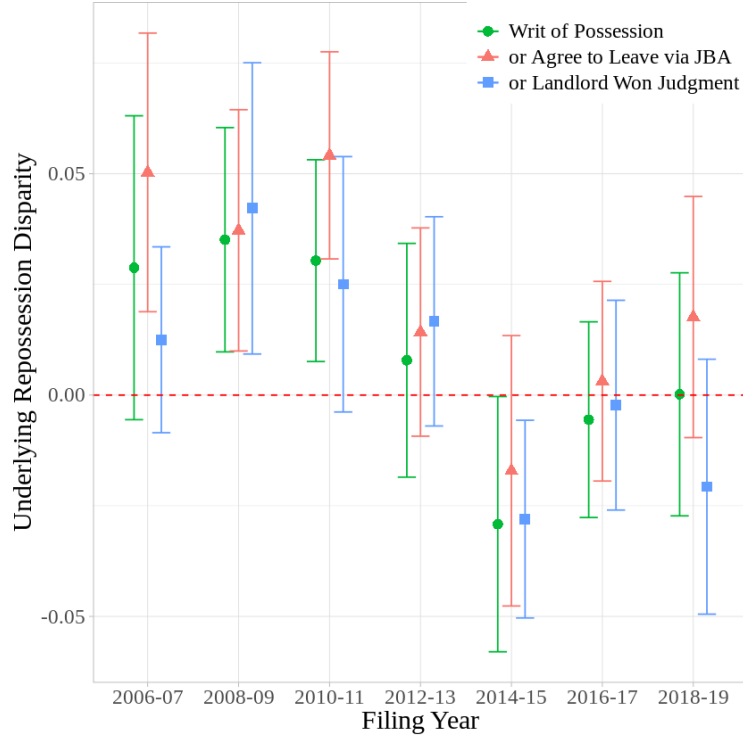
Figure A6: Philadelphia Eviction Case Outcomes
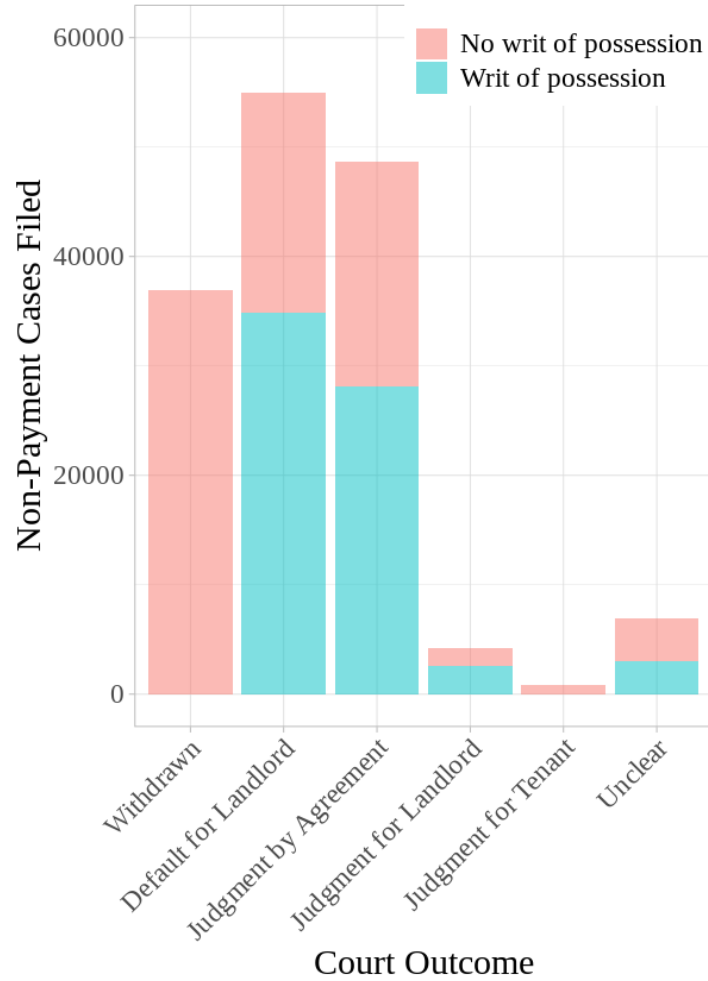
This figure plots the frequency of Philadelphia eviction case outcomes. The sample includes Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Judgment for tenant includes contested cases where the judge ruled in favor of the tenant and default judgments in favor of the tenant after the landlord did not appear in court. Cases with unclear outcomes have missing outcome variables or multiple occurrences of judgments or withdrawals.

Figure A7: Underlying Racial Disparity in Repossession over Time

This figure plots estimates from a regression of the landlord winning repossession on minority-by-year indicators. Coefficients are controlled for landlord fixed effects and contract rent-by-back rent fixed effects interacted with the 2-year bins. The back rent fixed effects correspond to $100 bins of back rent owed at the time of the filing. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.
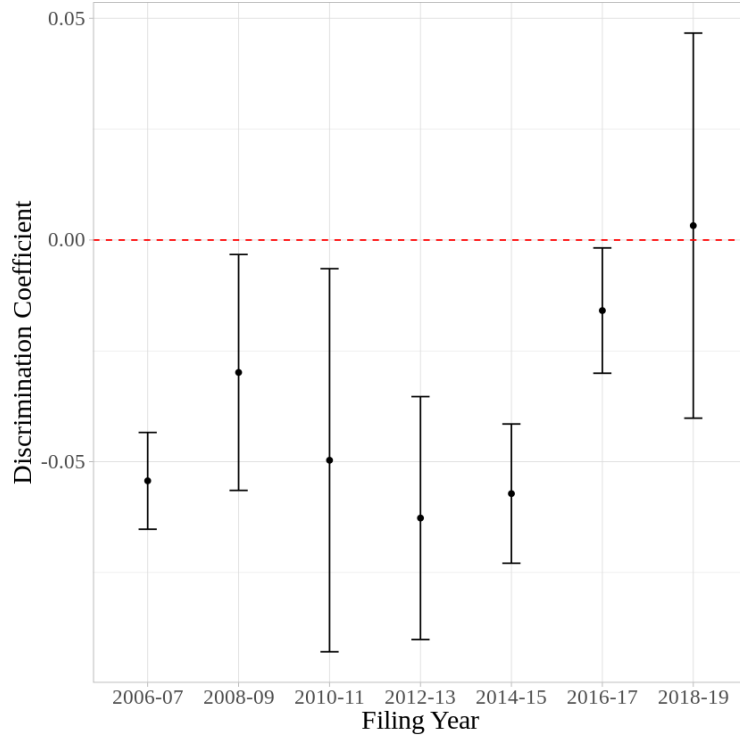
Figure A8: Racial Discrimination over Time

This figure plots the discrimination coefficients estimated from a heterogeneous version of Equation 11 by year. The outcome variable is log back rent. Coefficients are controlled for landlord-by-contract rent fixed effects interacted with the 2-year bins. The sample is restricted to Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Standard errors are clustered at the landlord level.

A.2 Supplemental Tables

Table A1: Alternate Units of Racial Discrimination

	Back Rent			
	Dollars (1)	Log Dollars (2)	Months (3)	Log Months (4)
Minority Tenant	-133.1652***	-0.0451***	-0.1759***	-0.0427***
	(33.9875)	(0.0121)	(0.0451)	(0.0116)
Observations	117,880	116,927	116,934	116,374
R^2	0.1498	0.6116	0.4877	0.3034
White Outcome Mean	2,073.1479	7.3858	2.3242	0.6128
Landlord × Contract Rent FE	✓	✓	✓	✓

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 11 with the outcome variable measured in various units. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Months of back rent is a continuous measure equal to dollars of back rent divided by contract rent. Contract rent fixed effects refer to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

Table A2: Racial Discrimination Under Varying Race Imputation Methods

| | Log Back Rent | | | | | |
| | 50% Rule | 60% Rule | 70% Rule | 90% Rule | City-based | Linear |
	(1)	(2)	(3)	(4)	(5)	(6)
Minority Tenant	-0.0237***	-0.0299***	-0.0381***	-0.0456***	-0.0262***	
	(0.0092)	(0.0105)	(0.0117)	(0.0118)	(0.0047)	
Pr(Minority Tenant)						-0.0253**
						(0.0128)
Observations	140,790	134,428	126,840	100,165	82,726	143,924
R^2	0.6017	0.6040	0.6072	0.6169	0.6072	0.5999
Mean Back Rent	1,078.64	1,067.92	1,055.51	999.70	1,099.81	1,083.12
Landlord × Contract Rent FE	✓	✓	✓	✓	✓	✓

*$p< 0.1$, **$p< 0.05$, ***$p< 0.01$. This table reports the total discrimination estimates under various race imputation methods. Columns 1 through 4 uses a sample of Philadelphia eviction filings caused only by non-payment of rent with tenant race imputations above the corresponding cutoff rule. Column 5 uses alternate tenant race imputations that incorporate first names, last names, and the city of residence as the geolocation level. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain city-based tenant race imputations. Column 6 reports a linear estimate of discrimination using the continuous imputed probability any tenant named on the filing belongs to a racial minority group. The sample includes Philadelphia eviction filings caused only by non-payment of rent. Contract rent refers to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

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Table A3: Robustness Checks for Omitted Lease Violations

	Log Back Rent	Log (Back Rent + Late Fees)	Log Adj. Claim
	(1)	(2)	(3)
Minority Tenant	-0.0575***	-0.0564***	-0.0320***
	(0.0116)	(0.0124)	(0.0117)
Observations	83,735	83,777	174,432
R^2	0.6301	0.6334	0.5664
Mean White Outcome $ Amount	1,565.50	1,641.94	1,737.39
Landlord × Contract Rent FE	✓	✓	✓

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports total discrimination estimates using alternative definitions of cases caused only by non-payment of rent and incorporating other components of the claim amount. The sample in columns 1 and 2 includes Philadelphia eviction cases filed only due to non-payment of rent with $0 of physical damages or other fees claimed in the filing and at least 80% likely tenant race imputations. The sample in column 3 includes Philadelphia eviction cases filed for any reason with at least 80% likely tenant race imputations. The adjusted claim amount is constructed by subtracting any attorney fees from the full claim amount. The remaining adjusted claim is the sum of back rent, physical damages, late fees, and other fees owed at the time of the filing. Contract rent fixed effects refer to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

Table A4: Tenure Robustness Checks

	Log Back Rent		
	(1)	(2)	(3)
Minority Tenant	-0.0370***	-0.0381***	-0.0402***
	(0.0038)	(0.0041)	(0.0029)
Observations	64,468	56,518	48,875
R^2	0.6813	0.6919	0.6972
Mean White Back Rent	1,602.43	1,591.91	1,572.13
Landlord $\times$ Contract Rent $\times$ Tenure FE	✓	✓	✓
Tenure Bin Size	12 months	6 months	3 months

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 11 with landlord-by-contract rent-by-tenure fixed effects The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Contract rent fixed effects refer to the exact dollar value of contract rent. Tenure fixed effects are 12 month, 6 month, or 3 month bins of tenure in the rental property prior to the filing. Standard errors are clustered at the landlord level.

Table A5: Effective Sample of Cases Meeting Identification Criteria

| | Log Back Rent | | | | | |
| | Full Sample | | | Effective Sample | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Minority Tenant	-0.4856*	-0.1134***	-0.0736***	-0.3530	-0.0843***	-0.0421**
	(0.2633)	(0.0237)	(0.0186)	(0.2916)	(0.0149)	(0.0180)
Observations	151,357	137,815	149,948	70,898	70,898	70,898
R^2	0.0265	0.4607	0.4825	0.0152	0.4834	0.5519
Mean White Back Rent	1,779.50	1,687.30	1,752.62	1,567.56	1,567.56	1,567.56
Landlord FE		✓			✓	
Contract Rent FE			✓			✓

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 11 using samples of Philadelphia eviction filings caused only by non-payment of rent with at least 80% certain tenant race imputations. Columns 1 through 3 do not further restrict this sample. Columns 4 through 6 restrict the sample to filings found in landlord-by-contract rent cells with at least one non-payment of rent filing against a white tenant and one against a minority tenant. Contract rent fixed effects refer to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

Table A6: Direct vs. Indirect Discrimination with Tenure Controls

	Log Back Rent			
	(1)	(2)	(3)	(4)
Minority Tenant	-0.0451***	-0.0351***	-0.0373***	-0.0450***
	(0.0121)	(0.0056)	(0.0134)	(0.0085)
Observations	116,927	64,502	64,502	64,502
R^2	0.6116	0.6313	0.6460	0.6653
Mean White Back Rent	1,612.96	1,616.39	1,616.39	1,616.39
Landlord × Contract Rent FE	✓	✓	✓	✓
Tenant Controls			✓	✓
Monthly Tenure FE			✓	✓
Census Tract FE				✓
Non-missing Controls Sample		✓	✓	✓
$\beta = \beta_{Col.2}$ $p\text{-}value$	0.4499		0.877	0.3294

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 11 with controls. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Column 1 restates the estimate of total discrimination from Table 3. Column 2 uses a restricted sample of filings with observable tenant demographic variables. Columns 3 and 4 introduce control variables. Tenant controls include the imputed gender of first tenant named, fixed effects for the number of tenants in the property listed on the filing, and rent burden fixed effects (2 percentage point bins of the ratio of contract rent to median household income among renters in the census tract). Monthly tenure fixed effects correspond to the number of months between the lease start date and the filing date. Contract rent fixed effects refer to the exact dollar value of contract rent. Standard errors are clustered at the landlord level.

Table A7: Marginal Outcome Test with Tenure Controls

	Writ of Possession	or Agree to Leave via JBA	or Landlord Won Judgment
	(1)	(2)	(3)
Minority Tenant	-0.0072	0.0003	-0.0089*
	(0.0080)	(0.0096)	(0.0050)
Observations	65,108	65,108	65,108
R^2	0.1691	0.1771	0.1999
White Outcome Mean	0.4509	0.4839	0.6472
Landlord $\times$ Contract Rent FE	✓	✓	✓
Tenant Controls	✓	✓	✓
Monthly Tenure FE	✓	✓	✓
Census Tract FE	✓	✓	✓

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. This table reports the results from estimating Equation 13. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Contract rent fixed effects refer to the exact dollar value of contract rent. Tenant controls include imputed gender of the first tenant named in the filing, fixed effects for the number of tenants in the property listed on the filing, and rent burden fixed effects (2 percentage point bins of the ratio of contract rent to median household income among renters in the census tract). Monthly tenure fixed effects correspond to the number of months between the lease start date and the filing date. The outcome variable in column 1 is an indicator for whether a landlord filed for a writ of possession. The outcome variable in column 2 is an indicator for whether the landlord filed for a writ of possession or the tenant agreed to vacate the property as part of a judgment by agreement (JBA). The outcome variable in column 3 is an indicator for whether the landlord filed for a writ of possession, the tenant agreed to vacate the property via a JBA, or the landlord won a default judgment or won a contested judgment (decided by the judge) regardless of filing for a writ of possession. Standard errors are clustered at the landlord level.

Table A8: Marginal Outcome Test with Scaled Outcomes

	Writ of Possession		or Agree to Leave via JBA		or Landlord Won Judgment	
	(1)	(2)	(3)	(4)	(5)	(6)
Minority Tenant	0.0304	-0.0098	0.0807	0.0230	-0.0570	-0.0534
	(0.0659)	(0.0748)	(0.0614)	(0.0824)	(0.0539)	(0.0646)
Observations	116,927	93,406	116,927	93,406	116,927	93,406
R^2	0.1515	0.1723	0.1638	0.1860	0.2172	0.2371
White Outcome Mean	3.2910	3.3117	3.6106	3.6284	4.8941	4.8875
Landlord × Contract Rent FE	✓	✓	✓	✓	✓	✓
Tenant Controls		✓		✓		✓
Census Tract FE		✓		✓		✓

*p< 0.1, **p< 0.05, ***p< 0.01. This table reports the results from estimating Equation 13 using scaled outcome measures of repossession. The sample includes Philadelphia eviction filings caused only by non-payment of rent and at least 80% certain tenant race imputations. Contract rent fixed effects refer to the exact dollar value of contract rent. Tenant controls include imputed gender of the first tenant named in the filing, fixed effects for the number of tenants in the property listed on the filing, and rent burden fixed effects (2 percentage point bins of the ratio of contract rent to median household income among renters in the census tract). The outcome variables are various measures of repossession scaled by the log of the amount of back rent owed at the time of the filing. The measure of repossession in columns 1 and 2 is an indicator for whether a landlord filed for a writ of possession. The measure of repossession in columns 3 and 4 is an indicator for whether the landlord filed for a writ of possession or the tenant agreed to vacate the property as part of a judgment by agreement (JBA). The measure of repossession in columns 5 and 6 is an indicator for whether the landlord filed for a writ of possession, the tenant agreed to vacate the property via a JBA, or the landlord won a default judgment or won a contested judgment (decided by the judge) regardless of filing for a writ of possession. Standard errors are clustered at the landlord level.

Appendix B   Data Construction

B.1   Landlord Linking Methodology

I construct landlord identifiers using landlord names and landlord addresses included in Philadelphia eviction records. This method is intended to account for inconsistent spellings and the fact that corporate landlords may list property-specific landlord names on eviction filing records. I implement the following procedure to generate unique landlord identifiers. For a given landlord name, I observe all landlord address variations associated with that name. For each of those address variations, I then observe all landlord name variations associated with that address. I repeat this process until no additional landlord name or address variations can be found. Then, I assign this linked set of landlord aliases a unique landlord identifier. I repeat this process for the entire sample of Philadelphia eviction cases. In the end, from 68,698 unique landlord names and 80,325 unique landlord addresses, I generate 41,747 unique landlord identifiers.

B.2 Race Imputation Methodology

I impute tenant race based on tenants' first names, last names, and census blocks of rental properties using the fBISG methodology outlined in Imai et al. (2022). Incorporating first names and granular geolocation measures greatly improves the accuracy of race imputations compared using last names alone (Voicu 2018; Imai and Khanna 2016).

The standard BISG approach estimates the conditional probability that an individual belongs to a racial group given the individual's name and geolocation. However, this approach can have substantial measurement error problems when using granular geolocation measures. Since the prior distribution $Pr(Race_i|Geolocation_i)$ comes from decennial census counts, some census blocks may have zero counts of individuals in certain racial groups which imposes a 0% probability of belonging to a racial group even if a name is distinctly associated with that racial group. The prior distribution is also decreasing in accuracy in time since the decennial census. Both of these census data problems are more significant for rapidly growing minority groups.

I utilize the improved fBISG method from Imai et al. (2022) which allows for gaining the accuracy from granular geolocation information while addressing these census data problems. This method uses a measurement error model for the observed census counts to ensure that zero counts do not necessarily imply 0% probability of belonging to that racial group. The fBISG model generates the conditional posterior probability that tenant i belongs to each potential racial group (White, Black, Hispanic, Asian, other) given the tenant's first name, last name, census block, the geolocation and imputed race of all other tenants, and uniform priors. These predictions incorporate 2010 decennial census counts by race and census block, the 2010 Census surname list which reports the racial distribution of surnames appearing at least 100 times, and the racial distribution of first names from voter registration data compiled by Imai et al. (2022). See Imai et al. (2022) for more detail on the fBISG race imputation methodology.

Appendix C   Proof of Marginal Outcome Test

C.1   Proof of Proposition 1

An eviction filing against tenant i at the margin $(X_i(t) = \tau_i)$ satisfies:

$$\left(\tilde{p}(\tau_i, Y_i^0, Z_i, R_i) + b^p(R_i)\right)\left(\tilde{v}(Y_i^0, Z_i) + b^v(R_i)\right) = c \tag{14}$$

Since $\tilde{p}(x, y, z, r) = \mathbb{E}[Y_i^* | X_i(t) = x, Y_i^0 = y, Z_i = z, R_i = r]$, this is equivalent to:

$$\mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = r] = \frac{c}{\tilde{v}(y, z) + b^v(r)} - b^p(r) \quad (15)$$

For $r \in \{white, minority\}$, it thus follows from the law of iterated expectations that:

$$\mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = r]$$
$$= \mathbb{E}\left[Y_i^* \middle| \mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = r] = \frac{c}{\tilde{v}(y, z) + b^v(r)} - b^p(r), Y_i^0 = y, Z_i = z, R_i = r\right]$$
$$= \mathbb{E}\left[\mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = r] \middle| \right.$$
$$\left. \mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = r] = \frac{c}{\tilde{v}(y, z) + b^v(r)} - b^p(r), Y_i^0 = y, Z_i = z, R_i = r\right]$$
$$= \frac{c}{\tilde{v}(y, z) + b^v(r)} - b^p(r)$$
$$(16)$$

Under no racial bias ($b^v(white) = b^v(minority)$ and $b^p(white) = b^p(minority)$):

$$\mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = minority] = \mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = white] \quad (17)$$

C.2   Proof of Proposition 2

This proof is by contradiction. Suppose a landlord exhibits no racial bias (accurate statistical discrimination). Then, $b^v(white) = b^v(minority) = b^v$ and $b^p(white) = b^p(minority) = b^p$. It follows from Equation 16 by the law of iterated expectations that:

$$\mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = r] = \frac{c}{\tilde{v}(y, z) + b^v} - b^p \quad (18)$$

so

$$\mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = minority] - \mathbb{E}[Y_i^* | X_i(t) = \tau_i, Y_i^0 = y, Z_i = z, R_i = white]$$
$$= \frac{c}{\tilde{v}(y, z) + b^v} - b^p - \frac{c}{\tilde{v}(y, z) + b^v} - b^p$$
$$= 0$$
$$(19)$$

Appendix D Bias from Discrete Back Rent

For my test for racial discrimination to be valid, I assume that the amount by which back rent may exceed the threshold at the time of filing is the same for white and minority tenants who have the same landlord and contract rent. If this assumption is violated, my estimate of discrimination includes bias from differential discrete accrual of back rent. Considering all tenants with the same landlord, this bias term for contract rent y is:

$$\mathbb{E}[X_i(t^*) - \tau_i | Y_i^0 = y, R_i = minority] - \mathbb{E}[X_i(t^*) - \tau_i | Y_i^0 = y, R_i = white] \qquad (20)$$

Define the last discrete change in back rent prior to the eviction filing as:

$$\Delta_i = X_i(t^*) - X_i(t^* - 1) \qquad (21)$$

Note that $X_i(t^* - 1)$ must be less than the threshold τ_i, implying that $X_i(t^*) - \tau_i \in [0, \Delta_i)$. Assume for simplicity that $X_i(t^*) - \tau_i$ has uniform density between 0 and Δ_i.

Suppose that for some share of tenants, back rent accrues at discrete increments equal to contract rent ($\Delta_i = Y_i^0$). For the remaining tenants, assume the most extreme alternative where back rent accrues continuously ($\Delta_i = 0$). Let α^m be the share of minority tenants with $\Delta_i = Y_i^0$ and α^w be the share of white tenants with $\Delta_i = Y_i^0$. Then, the bias term for contract rent y is equal to:

$$(\alpha^m - \alpha^w)\frac{y}{2} \qquad (22)$$

I next turn to the data to investigate whether it is a valid concern that any racial differences in the last discrete change in back rent prior to the filing could explain my estimate of discrimination. Given back rent owed at the time of the filing and contract rent, I observe whether tenants owe integer or non-integer months of back rent at the time of an eviction filing. It is a reasonable assumption that tenants owing integer months of back rent at the time of the filing have $\Delta_i = Y_i^0$. For the remaining tenants in the data that owe non-integer months of back rent at the time of the case filing, it is likely that $\Delta_i < Y_i^0$ and in the most extreme case, $\Delta_i = 0$.

My discrimination estimate is $-0.18y$ (Table A1). For bias from differential discrete accrual of back rent to fully explain this result, it must be the case that $\alpha^m - \alpha^w = -0.36$. In other words, among tenants with the same landlord and contract rent, the share of minority tenants owing integer months of back rent must be 36 percentage points lower than the share of white tenants owing integer months of back rent. In the data, minority tenants are only 2.2 percentage points less likely to owe integer months of back rent than white tenants with the same landlord and contract rent. This could only generate bias equal to $-0.011y$, which

is 6% of my true discrimination estimate. As such, any bias from differential discrete accrual of back rent cannot explain my estimate of discrimination.