Discrimination During Eviction Moratoria*

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PRELIMINARY AND INCOMPLETE

Abstract

We provide evidence of intensified discriminatory behavior by landlords in the rental housing market during the eviction moratoria instituted during the COVID-19 pandemic. Using data collected from an experiment that involved more than 25,000 inquiries of landlords in the 50 largest cities in the United States in the spring and summer of 2020, our analysis shows that the initiation of an eviction moratorium significantly disadvantaged African Americans in the housing search process. A housing search model explains this result, showing that discrimination is worsened when landlords cannot evict tenants for the duration of the eviction moratorium.

1 Introduction

The topic of housing precarity was brought to the forefront by the COVID-19 pandemic. COVID-19 was both a health and an economic crisis. Economic shutdown resulted in many households facing job-loss over a short period of time, which increased the risk of eviction for renters and foreclosure for owners. Absence of stable housing made it difficult to follow

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stay-at-home orders along with a multitude of other recommended measures. In response, government policies were implemented as public health measures at the local, state and federal levels to preserve housing stability. Included amongst these were rental assistance and eviction moratorium policies, the latter of which shut down the eviction process in the affected jurisdictions. Specifically, these moratoria prohibited landlords from evicting a tenant for the period when the policy was in place. If a tenant defaulted on rent, however, that rent would still be owed when the moratorium expired.

The main intent of eviction moratoria was to allow tenants to practice social distancing and comply with stay-at-home orders. A line of research has explored the impact these policies had on filings and on the spread of COVID-19 (Benfer et al., 2021; Hepburn et al., 2021, 2023; Leifheit et al., 2021; Nande et al., 2021; Hatamyar and Parmeter, 2023). However, an additional consequence was to increase the tenant's expected tenure. The subsequent increase in duration of the tenant's lease could intensify discriminatory practices in the process of applying for a lease as we illustrate with a simple model. If this is indeed the case, it may prove to be an unintended consequence of the moratorium.

Recent studies have shown that racial minorities face substantial discrimination in a wide range of market activities, from applying for a job to buying a car or renting an apartment. In the case of the housing market, racial discrimination can take place at various stages of the process, including home search (Christensen and Timmins, 2022; Ewens et al., 2014; Hanson and Hawley, 2011), negotiations over prices or rent (Bayer et al., 2017), home appraisal (Ambrose et al., 2021a), and mortgage lending (Aaronson et al., 2017; Zhao et al., 2006; Ambrose et al., 2021b; Frame et al., 2022). Discrimination that occurs at the initial search stage is particularly concerning because it could eliminate the possibility of a transaction for the minority home seeker before the rest of the process even has a chance to unfold.

The distortions induced by discrimination at the search stage can be large and lead to significant equity and welfare concerns. Experimental work using actors pretending to be prospective home buyers or renters has sought to measure these costs. According to the comparative work done across the Department of Housing and Urban Development's Housing Discrimination Studies (HDS), the most persistent form of discrimination in the housing market has been "discriminatory steering" of minority households into minority neighborhoods at the search stage (Dymski, 2006; Galster and Godfrey, 2005; Yinger, 1995). Christensen and Timmins (2022) find significant differences in the characteristics of neighborhoods (e.g., pollution, crime, poverty and skill-level of local residents) shown by realtors to white, African American, Hispanic, and Asian testers in the 2012 HDS study. Using a correspondence study (relying on online interactions using racialized names) of rental markets in five major markets, Christensen and Timmins (2023) find that discrimination imposes average welfare costs equivalent to between 3.5% and 4.4% of annual income for renters of color and search behavior results in greater welfare costs for African Americans as their incomes rise.

In this paper, we examine how discrimination in the rental housing search process interacted with policies intended to help renters secure more stable housing during the early stages of the pandemic. The moratoria placed on evictions during the spring and summer of 2020 provide variation in the constraints imposed on landlords with respect to how they might expect to deal with a tenant in default. We provide a theoretical model of the forward-looking landlord's decision process which shows that the effect on discriminatory activity at the time when an applicant inquires about the property could go either way, depending upon what are the most salient features of the policy from the landlord's perspective. We use the outcomes of a large-scale correspondence study of the rental market conducted during the pandemic to test the predictions of this model. Results accounting for the staggered repeal of moratoria across states show evidence that African Americans, in particular, faced significantly higher rates of discrimination when moratoria were in effect. A policy intended to help housing-insecure households may, therefore, have had the unintended consequence of making it harder for certain sub-groups to find housing during a critical juncture.

Our analysis speaks to a number of literatures in addition to those described above. During normal times, eviction has itself been a crisis confronting America's rental housing markets.[1] A large literature has explored who is most at risk of eviction (Desmond and Gershenson, 2017; Rutan and Desmond, 2021; Desmond, 2012) and what are the impacts on evicted tenants (Collinson et al., 2022; Humphries et al., 2019; Goplerud et al., 2021; Bullinger and Fong, 2021; Desmond and Kimbro, 2015; Kim et al., 2021; Schwartz et al., 2022; Himmelstein and Desmond, 2021; Hoke and Boen, 2021; Groves et al., 2021; Hatch and Yun, 2021). Another line of research has analyzed eviction policies including "Right-to-Counsel" (Abramson, 2021), rules governing the filing of eviction lawsuits (Gromis et al., 2022), and rent support and eviction moratoria (Corbae et al., 2023). Other work has examined the role of tenant screening in who can access housing (So, 2022; Rosen et al., 2021). While our paper studies the role of eviction policy on discrimination in the housing search process, there is research that studies the direct role of racial and ethnic discrimination in eviction decisions (Greenberg et al., 2016). There is also research on how policies intended to ensure decent and affordable housing may have the unintentional consequence of reducing housing access (Greif, 2018).

[1] See https://www.economist.com/united-states/2021/05/13/in-america-a-million-evictions-take-place-in-a-normal-year. For comprehensive time-series data on eviction filings and threatened evictions at the county level, see https://evictionlab.org.

The remainder of the is paper proceeds as follows. Section 2 describes our model, which shows that the effect of an eviction moratorium on landlord discriminatory behavior at the search stage is indeterminate and depends upon which aspects of the moratorium are more salient to the landlord. Section 3 describes a correspondence study conducted by Christensen et al. (2021), which provides the experimental evidence used to test the predictions of our model. Section 4 provides results of a simple baseline discrimination specification, confirming that results provided by Christensen et al. (2021), and Section 5 uses these data to carry out a difference-in-difference analysis that tests our model predictions. In Section 6, we show that our results with respect to African Americans become even stronger when we account for the staggered repeal of moratorium policies across states. Section 7 considers various forms of treatment heterogeneity and robustness checks, and Section 8 concludes.

2 Model

We illustrate that discrimination could increase or decrease with the implementation of an eviction moratorium with a simple search model. Assume there are two types of applicants for a rental property: a minority applicant with type $i = M$ and a non-minority applicant with type $i = N$. Whenever an applicant is offered to lease a housing unit, the applicant accepts this offer and becomes a renter. Each period, the renter pays rent $R > 0$ with probability π and defaults with probability $1-\pi$, where $F_i(\pi)$ is the distribution function of the probability of rent payment as perceived by a landlord which could differ by the type of applicant. We interpret a first-order stochastic dominance of the perceived distributions of the probability to pay $F_M(\pi) > F_N(\pi)$ as statistical discrimination. The probability of the rent payment π is realized when the landlord calls and interviews the renter. If the renter defaults, her landlord recovers a rent payment net of the collection costs equal to $L < R$. The landlord and renter do not discount future payoffs, and the renter stays in the unit for the next period with the probability s.

The landlord's per-period payoff includes the expected rent $\pi_i R + (1 - \pi_i)L$ net of a utility loss from leasing to an applicant of type i, κ_i, that satisfies $L < \kappa_i < R$. Whenever $\kappa_M > \kappa_N$, we interpret this as taste-based discrimination. Before leasing, the landlord chooses which type of applicant to call. Each call is costly. Assume that the difference between the cost of calling a minority applicant and the cost of calling a non-minority applicant is a random variable that can be positive or negative ψ. Denote $F_\psi(.)$ and $f_\psi(.)$ the cumulative distribution function and probability density function, correspondingly. Assume that $f_\psi(.) > 0$ on its support.

The landlord decides which type of applicant to call. Once the landlord calls an applicant of type i, the probability to repay rent $\pi \sim F_i(\pi)$ is realized. Based on realization π, the landlord decides whether or not to offer a lease to this applicant. If he offers a lease, the applicant accepts. If the landlord does not offer a lease, he starts the search over. The optimal decision will be characterized by a threshold for the probability to repay p_i, such that the landlord makes a lease offer if $\pi > p_i$, and does not otherwise.

To solve the landlord's problem, denote the landlord's option value to lease an empty rental unit as V, and solve the problem backward. The value of a rental unit occupied by an applicant of type i for the landlord is

$$w_i = \mathbb{E}[\pi R + (1-\pi)L - \kappa_i + sw_i + (1-s)V | \pi \geq p_i] = sw_i + (1-s)V + L - \kappa_i + (R-L)\frac{\int_{p_i}^1 \pi dF_i(\pi)}{1-F_i(p_i)},$$

$$w_i = V + \frac{1}{1-s}\left(L - \kappa_i + (R-L)\frac{\int_{p_i}^1 \pi dF_i(\pi)}{1-F_i(p_i)}\right),$$

The value of calling an applicant of type i for the landlord is

$$W_i = \max_{p_i}[\text{Prob}(\pi < p_i)V + \text{Prob}(\pi \geq p_i)w_i].$$

The expected utility on the right-hand side of the previous equation can be rewritten as

$$F_iV + (1-F_i)[V + \frac{1}{1-s}(L - \kappa_i + (R-L)\frac{\int_{p_i}^1 \pi dF_i(\pi)}{1-F_i})] = V + \frac{((1-F_i)(L-\kappa_i) + (R-L)\int_{p_i}^1 \pi dF_i(\pi))}{1-s},$$

where $F_i \equiv F_i(p_i)$. The first-order condition for maximizing this expected utility over p_i is

$$-f_i(p_i)(L-\kappa_i) + (R-L)(-p_if_i(p_i)) = 0.$$

with the solution $p_i^* = (\kappa_i - L)/(R-L)$. Because we assumed $L < \kappa_i < R$, $p_i^* \in (0,1)$.

Let $p_i = p_i^*$, then the value of calling an applicant of type i is

$$W_i = V + \frac{1}{1-s}\{R \underbrace{\int_{p_i}^1 \pi dF_i(\pi)}_{\text{Unconditional prob. of payment}} + L \underbrace{\int_{p_i}^1 (1-\pi) dF_i(\pi)}_{\text{Unconditional prob. of default}} - \underbrace{(1-F_i(p_i))}_{\text{Prob. to lease to } i} \kappa_i\}.$$

and the value of an empty rental unit is $V = \mathbb{E}\max\{W_M - \psi, W_N\}$.

The landlord calls a minority applicant if $W_M - \psi > W_N$, and a non-minority applicant otherwise to maximize V. This optimal choice results in the following probability of calling a minority applicant:

$$P_M^{\text{Call}} = \text{Prob}(W_M - \psi > W_N) = F_\psi(W_M - W_N),$$

where the difference in the values of calling a minority and non-minority applicant on the right-hand side is determined from

$$W_M - W_N = \frac{L}{1-s}\left(\int_{p_M}^{1}(1-\pi)dF_M(\pi) - \int_{p_N}^{1}(1-\pi)dF_N(\pi)\right).$$

Eviction Moratoria

There are multiple ways to interpret the effect of the eviction moratorium on the problem of the landlord. We consider two of them to show that the eviction moratorium can either increase or decrease discrimination depending on the interpretation.

One way of interpreting the effect of the eviction moratorium in the model is a lower payoff for the landlord in case of the tenant's default, L. The eviction moratorium allowed the renters to stay in the rental units for the duration of the eviction moratorium even if they did not pay the rent. The accumulated rent together with any late fees was due at the end of the eviction moratorium. Because the rent and late fees are deferred further into the future during the eviction moratorium, we can interpret this as a decrease in L.

The second way of interpreting the eviction moratorium is viewing it as the increase in the expected tenure of the tenant, determined by the probability of staying in the unit, s. During the moratorium, this probability is elevated because the landlord cannot evict the tenant.

Our experiment measures discrimination as a differential response in the response rate of the landlord. Hence, we are interested in the change in the probability of the landlord responding to or calling a minority applicant. We show that this probability increases or decreases during the moratorium if we use the first interpretation and decreases during the moratorium if we use the second one. In other words, the end of the eviction moratorium can increase or reduce discrimination under the first interpretation and reduces discrimination under the second interpretation.

Eviction moratorium as a decrease in the landlord's payoff in case of the renter's default: $L\downarrow$. When the landlord's payoff L drops, he raises the optimal threshold on the probability of rent payment $p_i = (\kappa_i - L)/(R - L) = 1 + (\kappa_i - R)/(R - L)$: $\partial p_i/\partial L = (\kappa_i - R)/(R - L)^2 < 0$, where $\kappa_i - R < 0$ so that p_i increases when L drops.

To study the change in the observed response rate, we need to know how the difference in the payoff from leasing to a minority applicant relative to a non-minority applicant changes:

$$\frac{dP_M^{\text{Call}}}{dL} = \frac{dF_\psi(W_M - W_N)}{dL} = \underbrace{f_\psi(W_M - W_N)}_{>0} \frac{d(W_M - W_N)}{dL}.$$

Because the landlord readjusts p_i to ensure $\partial W_i/\partial p_i = 0$, the envelope theorem implies

$$\frac{d(W_M - W_N)}{dL} = \frac{\partial(W_M - W_N)}{\partial L} = \frac{1}{1-s}[\int_{p_M}^1 (1-\pi)dF_M(\pi) - \int_{p_N}^1 (1-\pi)dF_N(\pi)].$$

In the case of purely taste-based discrimination so that $F_M(\pi) - F_N(\pi) = F(\pi)$, the landlord's utility loss from a minority tenant is higher than from a non-minority, $\kappa_M > \kappa_N$, in which case she requires a higher level of credibility p from the tenant: $p_M > p_N$. Then the probability of calling is negatively related to L:

$$\frac{d(W_M - W_N)}{dL} = \frac{1}{1-s}[\int_{p_M}^1 (1-\pi)dF(\pi) - \int_{p_N}^1 (1-\pi)dF(\pi)] < 0.$$

In the case of purely taste-based discrimination so that $\kappa_M = \kappa_N$ but $F_M(\pi) > F_N(\pi)$, the sign of the expression above could be negative or positive:

$$\begin{aligned}\frac{d(W_M - W_N)}{dL} &= \frac{1}{1-s}[\int_{p_M}^1 (1-\pi)dF(\pi) - \int_{p_N}^1 (1-\pi)dF(\pi)] = \\ &= \int_p^1 (F_M(\pi) - F_N(\pi))d\pi - (1-p)(F_M(p) - F_N(p)).\end{aligned}$$

If we assume that $F_M(\pi) - F_N(\pi)$ is decreasing for $\pi \geq p$, which also means that $f_M(\pi) < f_N(\pi)$ for $\pi \geq p$. Then $\int_p^1 (F_M(\pi) - F_N(\pi))d\pi < (1-p)(F_M(p) - F_N(p))$, because we have taken the largest value that the integrand takes and multiplied it by the length of the interval that we integrate over. If this assumption holds, then $\partial(W_M - W_N)/\partial L < 0$ as in the case of purely taste-based discrimination.

If $\partial(W_M - W_N)/\partial L < 0$ and the payoff of the landlord in case of tenant's default, L, is lower during the moratorium, the probability of calling a minority applicant P_M^{Call} increases. Hence, we would observe less discrimination during the moratorium, and the end of the moratorium would be associated with an increase or a decrease in discrimination.

Eviction moratorium as a higher probability to stay in the unit: $s \uparrow$**.** Another interpretation of the eviction moratorium is an increase in the duration of the renter's stay in the unit, s. To consider the effect of this change, use $\int_{p_i}^{1} \pi dF_i(\pi) = \pi F_i(\pi)|_{p_i}^{1} - \int_{p_i}^{1} F_i(\pi)d\pi = 1 - p_i F_i(p_i) - \int_{p_i}^{1} F_i(\pi)d\pi$ to rewrite (**??**) as

$$W_i = V + \frac{R-L}{(1-s)}\{1 - p_i - \int_{p_i}^{1} F_i(\pi)d\pi\}.$$

Because the optimal threshold on the probability to repay the rent $p_i = (\kappa_i - L)/(R-L)$ does not depend on the probability of the renter staying for another period s, we have

$$\frac{dW_i}{ds} = \frac{R-L}{(1-s)^2}\{1 - p_i - \int_{p_i}^{1} F_i(\pi)d\pi\}.$$

Thus, the change in the difference of the payoffs from the unit leased to a minority and a non-minority applicant is

$$\frac{\partial(W_M - W_N)}{\partial s} = \frac{R-L}{(1-s)^2}\{-(p_M - p_N) - (\int_{p_M}^{1} F_M(\pi)d\pi - \int_{p_N}^{1} F_N(\pi)d\pi)\}.$$

In a case of pure taste-based discrimination with $F_M(\pi) = F_N(\pi) = F(\pi)$ and $\kappa_M > \kappa_N$ so that $p_M > p_N$, we can use $-(p_M - p_N) = -\int_{p_N}^{p_M} d\pi$ and $-(\int_{p_M}^{1} F(\pi)d\pi - \int_{p_N}^{1} F(\pi)d\pi) = \int_{p_N}^{p_M} F(\pi)d\pi$ to show that minority applicants get fewer calls from landlords during the moratoria, or, put it differently, the end of the moratoria reduces discrimination:

$$\frac{\partial(W_M - W_N)}{\partial s} = -\frac{(R-L)}{(1-s)^2}\int_{p_N}^{p_M} (1 - F(\pi))d\pi < 0.$$

In a case of a pure statistical discrimination with $F_M(\pi) > F_N(\pi)$ and $\kappa_M = \kappa_N$ so that $p_M = p_N$, the conclusion is the same:

$$\frac{\partial(W_M - W_N)}{\partial s} = -\frac{R-L}{(1-s)^2}(\int_{p}^{1} F_M(\pi)d\pi - \int_{p}^{1} F_N(\pi)d\pi) < 0.$$

To sum up, the ending of the moratorium leads to less discrimination or more discrimination depending on the effect of the moratorium on the interaction of the renter and the landlord. Thus, the effect of the moratorium on discrimination is an empirical question that we address using the corresponding study. Our empirical estimates suggest that the end of the moratorium reduces discrimination.

3 Correspondence Study

We test the predictions of this model using data collected as part of a correspondence study undertaken by Christensen et al. (2021) in the United States in the spring and summer of 2020. A software bot developed by Christensen's team at the National Center for Supercomputing Applications was used to examine more than 25,428 interactions between property managers and fictitious renters engaged in search on an online rental housing platform, revealing patterns of discrimination encountered in the initial stage of a search.[2] The technology was designed to scale data collection and the execution of statistically powered experimental discrimination monitoring at a low cost.

The bot sent a randomized sequence of inquiries from African American, Hispanic, and white identities to properties in the selected cities, allowing for a comparison of the patterns of discrimination facing renters of color relative to a comparison white identity. The experiment targeted listings in downtown and suburban areas of each market on the day following the day on which each property was listed on the platform. For each listing, the bot then initiated a three-day sequence of inquiries, sending one inquiry per day using fictitious identities drawn in random sequence from a set of 18 first/last name pairs that were selected to elicit cognitive associations with one of the racial/ethnic categories. These names are summarized in Table 1. Property managers never received inquiries from two different identities on the same day. To account for the fact that names not only signal race but also other unobserved characteristics such as income (Guryan and Charles, 2013; Fryer Jr and Levitt, 2004), the bot further stratified sampling of first names using maternal educational attainment and gender. Responses from property managers were registered as such if they were received within seven days and indicated that the property was available.

4 Baseline Discrimination Specification

The experimental design described in the prior section involves a sequence of binomial decisions j, where the property manager of a given listing i decides whether to respond ($Response_{ij} = 1$) or not ($Response_{ij} = 0$) with $j = 1, 2, 3$. We begin by estimating the magnitude of discriminatory constraints using the following linear probability model, which limits identifying variation to within-property differences in behavior:

[2] The correspondence experiment used a computer bot that sent inquiries from fictitious renters to 8,476 property managers across the fifty largest metropolitan housing markets in the United States. Metropolitan housing markets were delineated using Core-Based Statistical Areas (CBSAs) as defined by the US Census. The sampling protocol was balanced across markets, such that rounds of experimental trials were conducted in unison. This balance ensured comparability of discriminatory constraints across different markets, avoiding conflation of regional differences with a temporal (seasonal) variation.

Table 1: First and Last Names of Identities Used in the Correspondence Study

African American	**Hispanic**	**White**
Nia Harris	Isabella Lopez	Aubrey Murphy
Jalen Jackson	Jorge Rodriguez	Caleb Peterson
Ebony James	Mariana Morales	Erica Cox
Lamar Williams	Pedro Sanchez	Charlie Myers
Shanice Thomas	Jimena Ramirez	Leslie Wood
DaQuan Robinson	Luis Torres	Ronnie Miller

$$Response_{ij} = \delta_i + \beta_{AA} African\ American_j + \beta_H Hispanic_j + X_j^{'}\theta + \epsilon_{ij}, \tag{1}$$

where $African\ American_j$ and $Hispanic_j$ are indicator variables that take a value of one if the race group associated with the identity is either African American or Hispanic; and zero otherwise. X_j is a vector of identity-specific characteristics: gender, maternal education level, and the order in which the inquiry was sent. δ_i is a property-level fixed effect. Given that names are drawn randomly and balanced across gender, education level, and inquiry order, estimates of β should be robust to the inclusion/omission of X_j. Christensen et al. (2021) demonstrate that estimates are consistent when including/omitting control variables and when using a conditional logit vs. a linear probability model. Table 2 shows the estimates from this linear probability model using all weeks and states. Table 3 shows the estimates from the Probit and Logit models. The estimates confirm the presence of discrimination against minorities.

5 Difference-in-Differences

Defining Treatment

Most moratoria that were put into place were initiated over a relatively short period of time near the start of the pandemic.[3] Hence, instead of focusing on how the beginning of a moratorium affects the discriminatory behavior of landlords, we focus on the end of the moratoria. Moratoria ended at different times over the course of the summer of 2020 before the CARES Act put into place a national moratorium on September 4, 2020. Figure 2 shows the map with the last week of the eviction moratorium across different states. Figures 5a and 5b in the Appendix show the map with states that implemented and did not implement the eviction moratorium, and, if they did, the week when the moratorium started.

[3]Eviction moratoria expirations have been used elsewhere in the literature on policy impacts related to COVID-19. See Benfer et al. (2021) as an example.

Table 2: Estimates from the Baseline Discrimination Specification on the Full Sample

	Dependent Variable: Response			
	(1)	(2)	(3)	(4)
African American	-0.0564***	-0.0564***	-0.0564***	-0.0569***
	(0.00576)	(0.00575)	(0.00575)	(0.00574)
Hispanic	-0.0268***	-0.0268***	-0.0269***	-0.0274***
	(0.00576)	(0.00575)	(0.00575)	(0.00574)
Observations	22,086	22,086	22,086	22,086
R-squared	0.006	0.009	0.010	0.015
Number of addresses	7,362	7,362	7,362	7,362
Gender	No	Yes	Yes	Yes
Educational Level	No	No	Yes	Yes
Inquiry Order	No	No	No	Yes

Notes: 1) Table reports coefficients from a within-property linear regression model. 2) The outcome variable is an indicator of whether a response was received from the property manager. 3) The mean response to a white identity is 0.5736. 4) Standard errors in parentheses. 4) ***, **, and * denote significance at the 1%, 5%, and 10% levels.

To arrive at our analysis sample, we drop all states in which there was never a moratorium, and we drop all observations in each state with a moratorium in the weeks prior to when it was initiated. We define treatment as the end of an eviction moratorium that had previously been in place so that $Treatment_j$ is an indicator variable that takes a value of one if the inquiry was sent after the end of the moratorium.

Our correspondence study starts with the first inquiry on February 6, 2020, and ends with the last inquiry on July 31, 2020. Because we drop observations before the start of the moratorium, the earliest date of the inquiry in our analysis sample is March 13, 2020. The earliest date when a state lifted the eviction moratorium is May 15, 2020, and the latest date when a state lifted the moratorium in our sample is July 15, 2020. Figure 1 shows the distributions of the dates and weeks when the moratoria were lifted in our sample.

Difference-in-Differences Specification

We start our study of how the discriminatory behavior changed when moratoriums ended by estimating a Difference-in-Differences specification:

Table 3: Probit and Logit Estimates

	Dependent Variable: Response	
	(1)	(2)
	Probit	Logit
African American	-0.145***	-0.234***
	(-6.98)	(-6.99)
Hispanic	-0.0708***	-0.114***
	(-3.39)	(-3.39)
Male	-0.0908***	-0.146***
	(-5.34)	(-5.35)
Less Than High School	-0.00462	-0.00774
	(-0.22)	(-0.23)
High School Graduate	-0.0874***	-0.141***
	(-4.21)	(-4.23)
Inquiry Order=2	-0.0787***	-0.127***
	(-3.77)	(-3.78)
Inquiry Order=3	-0.133***	-0.213***
	(-6.38)	(-6.38)
Observations	22086	22086

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

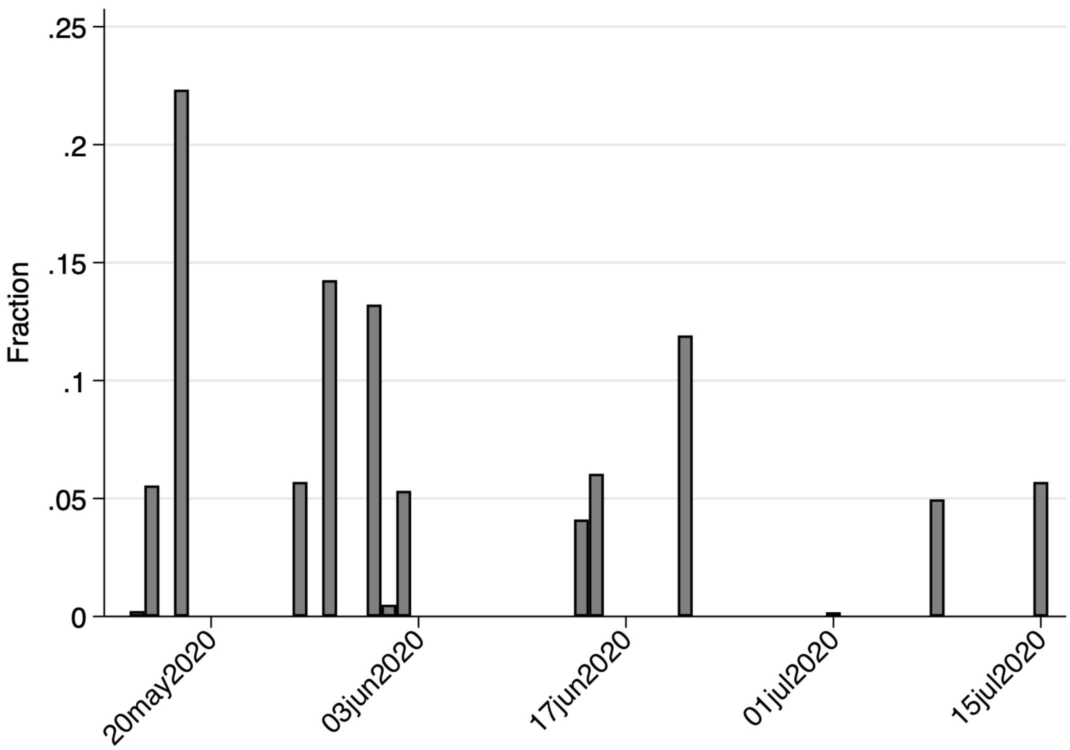
$$Response_{ijt} = \delta_i + \beta_{AA} African\ American_j + \beta_H Hispanic_j + \beta_T Treatment_{jt} + \qquad (2)$$
$$+ \beta_{AAT} Treatment_{jt} \times African\ American_j + \beta_{HT} Treatment_{jt} \times Hispanic_j + X_j^{'} \theta + \epsilon_{ij},$$

where i is a rental property, j is the inquiring identity, t is a day. $African\ American_j$ and $Hispanic_j$ are indicator variables that take a value of one if the race group associated with the identity is either African American or Hispanic, and zero otherwise. X_j are other attributes associated with identity j (gender, maternal education). δ_i is a rental property fixed effect. $Response_{ijt}$ take a value of one if inquiry by identity j to property i on day t yields a response, and zero otherwise.

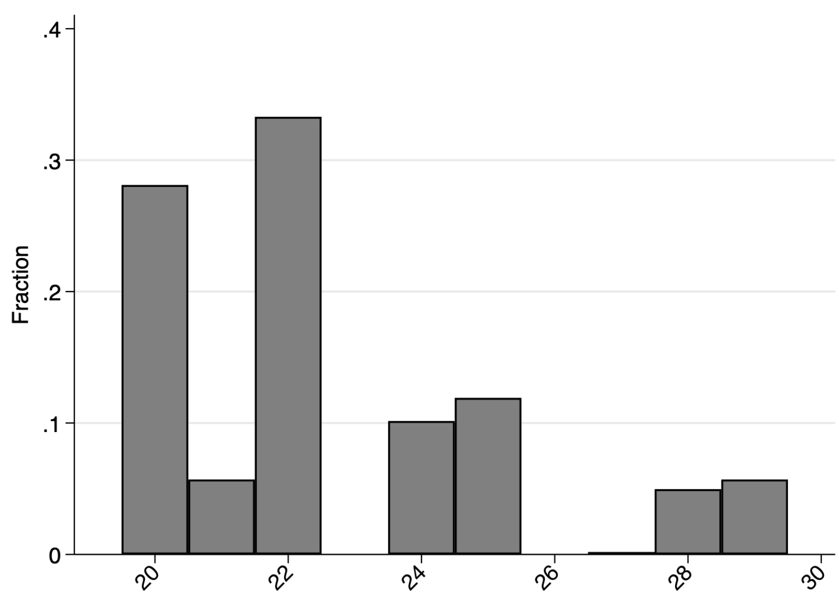
Columns (1) through (4) of Table 4 include specifications that control for the number of evictions in a county in 2018 (from Gromis et al. (2022) which is the latest available data prior to the pandemic), the index of the stringency of the eviction policies in a county, week fixed effects, but do not include property fixed effects. Column (5) reports the results with the week and property fixed effects and is our preferred specification. Column (6) uses the week and property fixed effects and clusters the errors by state. We find that African

American and Hispanic identities are less likely in general to receive a response compared to a white identity when a moratorium is in place. White identities in our sample received a response 57.36% of the time during moratoria. The coefficient on $African\ American$ implies that an African American identity with the same education, gender, and inquiry order would only receive a response 51.26% of the time, implying a relative response ratio of 0.89 during a moratorium. Focusing on the impact of an expiring moratorium, we find that this increases the response to an African American identity by an additional 0.037. This increases the post-moratoria relative response ratio for African American identities to 0.96. Hence, the initiation of an eviction moratorium significantly disadvantages African American identities in the housing search process relative to their white counterparts. While the direction of the effect is similar for Hispanic identities, the result is not statistically significant.

Figure 1: The Distribution of the End of Moratoria Dates



(a) Dates



(b) Weeks

Figure 2: The Last Week of the Eviction Moratoria across the U.S.

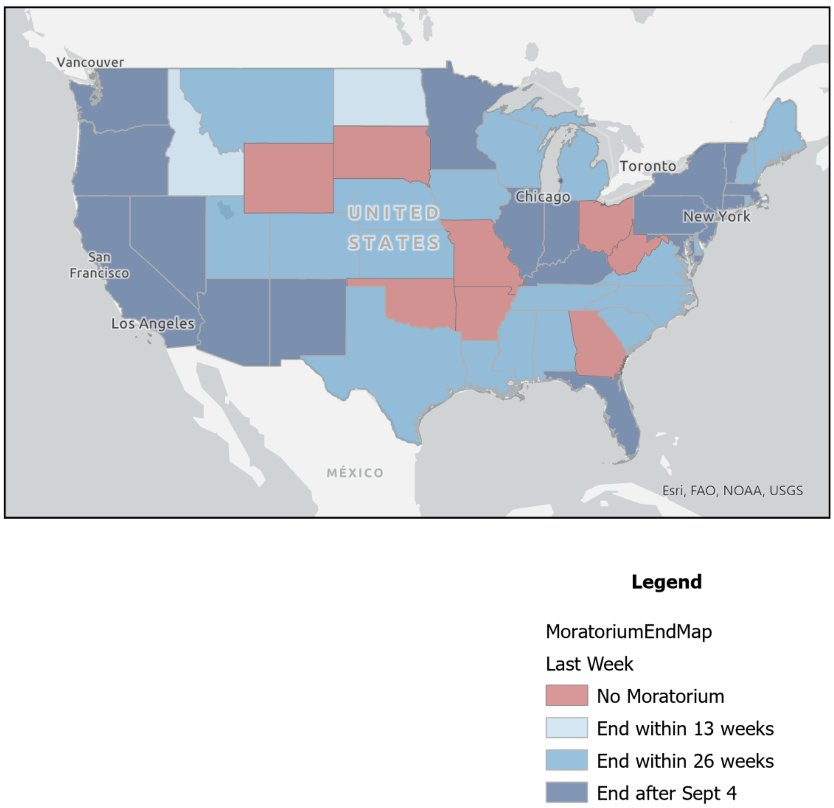


Table 4: Impact of Ending Eviction Moratorium on Likelihood of Receiving a Response

	Dependent Variable: Response					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.094***	-0.095***	-0.109***	-0.055***	-0.017	-0.017
	(0.018)	(0.018)	(0.020)	(0.020)	(0.089)	(0.102)
African American	-0.062***	-0.062***	-0.063***	-0.063***	-0.061***	-0.061***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.013)
African American x Treatment	0.038**	0.038**	0.053***	0.053***	0.037**	0.037*
	(0.018)	(0.018)	(0.020)	(0.020)	(0.018)	(0.021)
Hispanic	-0.033***				-0.033***	-0.033***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)
Hispanic x Treatment	0.027	0.027	0.034*	0.033*	0.026	0.026
	(0.018)	(0.018)	(0.020)	(0.019)	(0.018)	(0.020)
#Evictions in 2018, thousands			-0.001***	-0.001***		
			(0.000)	(0.000)		
Stringency Index		-0.000	-0.000			
		(0.000)	(0.000)			
Male	-0.039***	-0.039***	-0.042***	-0.042***	-0.039***	-0.039***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.009)
Less Than High School	0.003	0.003	0.001	0.001	0.002	0.002
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
High School Graduate	-0.030***	-0.030***	-0.035***	-0.035***	-0.025***	-0.025**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.010)
Inquiry Order = 2	-0.036***	-0.036***	-0.034***	-0.042***	-0.041***	-0.041***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Inquiry Order = 3	-0.053***	-0.053***	-0.049***	-0.047***	-0.044***	-0.044***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
Constant	0.658***	0.672***	0.692***	0.825***	0.618***	0.606***
	(0.010)	(0.032)	(0.033)	(0.051)	(0.021)	(0.022)
Observations	16,913	16,913	15,053	15,053	16,913	16,913
R-squared					0.026	0.026
Number of addresses	5,654	5,654	5,034	5,034	5,654	5,654
Weekly FEs	No	No	No	Yes	Yes	Yes
Property FEs	No	No	No	No	Yes	Yes
Clustered at State-level	No	No	No	No	No	Yes

Notes: 1) The outcome variable is an indicator of whether a response was received from the property manager, 2) Standard errors in parentheses. 3) ***, **, and * denote significance at the 1%, 5%, and 10% levels.

6 Staggerred Differences-in-Differences

To check the robustness of our results to the staggered nature of the treatment, we undertake a two-part estimation procedure to measure the effect of eviction moratoria on discrimination.

Stage #1: Discrimination Coefficients

In the first stage, we recover a set of estimated coefficients describing the likelihood of receiving a response relative to a white renter in each week and state. This is done by estimating a model of the form:

$$Response_{ijkt} = \beta_{AA,kt} African\ American_j + \beta_{H,kt} Hispanic_j + X_j' \theta_{kt} + \delta_i + u_{ijkt}, \qquad (3)$$

where i is a rental property, j is the inquiring identity, k is a state, t is a week. $African\ American_j$ and $Hispanic_j$ are indicator variables that take a value of one if the race group associated with the identity is either African American or Hispanic, and zero otherwise. X_j are other attributes associated with identity j (gender, maternal education). δ_i is a rental property fixed effect. $Response_{ijkt}$ take a value of one if inquiry by identity j to property i in state k in week t yields a response, and zero otherwise.

Table 5: Estimates of African American and Hispanic Coefficients from the First Stage

	Mean	SD	Min	Max
African American	-0.052	0.300	-1.375	1.389
Hispanic	-0.022	0.311	-2.000	1.111

Stage #2: Moratorium Effect

Our primary interest is in how discrimination changes with a change in the eviction moratorium policy environment. The eviction moratoria ended at different times so the treatment is staggered in that different states, and not-yet-treated states become the controls for the treated states. Recent research has documented the biases that can arise in these staggered-treatment contexts. We implement the procedure proposed by Callaway and Sant'Anna (2021) (CS) for summarizing the overall effect of participating in treatment in this setting.

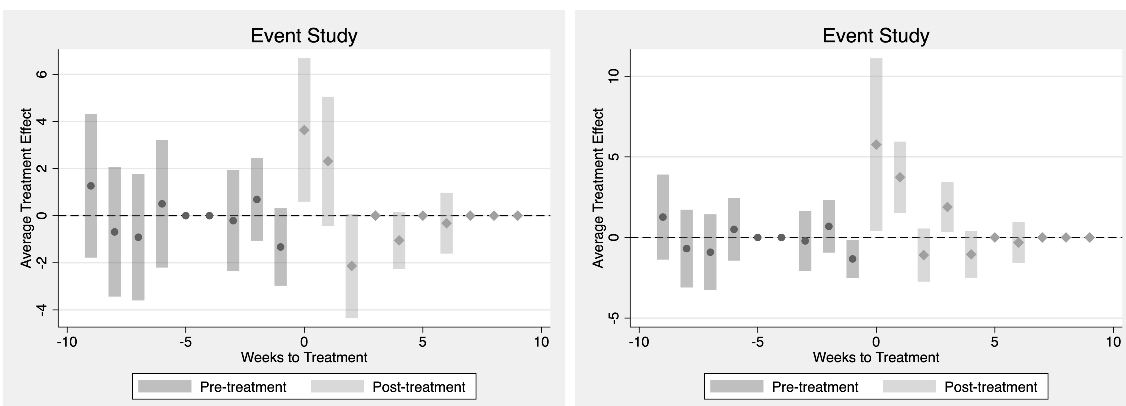
The CS procedure runs a separate difference-in-differences regression for each week, defining treatment states to be those that had ended their moratoria and control states as those that had not. This yields an average treatment effect on the treated for that time-period-defined group (g). Our baseline specification does not incorporate any additional controls.

$$ln(\frac{\rho_{kt}^{W}+\beta_{R,kt}}{\rho_{kt}^{W}}) = \alpha_0^g + \alpha_1^g TREAT_{kt} + \alpha_2^g POST_{kt} + \alpha_3^g TREAT_{kt} \times POST_{kt} + \nu_{kt}, \quad (4)$$

where the left-hand side variable is the log of the relative response ratio for an individual of race $R \in (AA,\ H)$ relative to a white individual in week t in state k,[4] $TREAT_{kt}$ takes a value of one if state k falls into treatment group g and zero state k is not yet treated, and $POST_{kt}$ takes a value of one if state k is post treatment for group g. α_3^g describes the average treatment effect on the treated for group g. The CS procedure provides weights to combine these group estimates into a single overall effect.

Table 6 and Figure 3 show the estimates for the African American coefficient. The estimates are positive, suggesting that the end of the moratorium increases responses to African American identities. Therefore, the discrimination intensified during the eviction moratorium.

Figure 3: Event Study Graphs from Specifications with Dropped Outliers



(a) Errors Clustered by State

(b) After George Floyd Dummy

[4]This is a function of the white response rate in state k in week t, ρ_{kt}^{W}, and the discrimination coefficient for race R, $\beta_{R,kt}$.

Table 6: The Two-Stage Staggered Difference-in-Differences Estimates

	Dependent Variable: Log of the Relative Response to an African American Identity			
	(1)	(2)	(3)	(4)
ACS and COVID Vars	X	X	X	X
Clustered by State		X		X
George Floyd Dummy			X	X
	Panel A: Full Sample			
Average Treatment Effect	1.576	1.576	2.497	2.497
95% Confidence Interval	(0.551, 2.602)	(0.369, 2.784)	(0.825, 4.168)	(1.659, 3.335)
Number of Obs.	350	350	350	350
	Panel B: Outliers Dropped			
Average Treatment Effect	1.247	1.247	1.901	1.901
95% Confidence Interval	(0.140, 2.353)	(-0.060, 2.553)	(0.219, 3.582)	(1.052, 2.749)
Number of Obs.	344	344	342	342

Notes: 1) The outcome variable is the log of the relative response ratio to an African American identity relative to a white identity. 2) Baseline specification in column (1) includes state fixed effects and American Community Survey (ACS) 2015-2019 and COVID control variables: the share of renters, the share of elderly, the share of African Americans, the share of Hispanics, the share of natives, the share of population with less than high school diploma, the share of population with a bachelor or higher degree, the share that carpools, the share that uses public transportation, the share that uses other means of transportation, the share of population living in group quarters, the share of uninsured population, the share of essential workers, total population, population density, the logarithm of median household income, the number of COVID cases, deaths, and tests in the state. 3) Panel B shows results when we drop the lowest and highest 1% of values of the relative response rate before the estimation.

7 Robustness Checks and Treatment Heterogeneity

7.1 Sample Selection in the Two-Stage Procedure

One concern with the two-stage procedure that we have used is the sample selection. However, if we reduce our sample to states that are included in the 2-stage CS procedure and estimate the Difference-in-Difference specification, we get similar results, shown in Table 7. Columns (1) and (2) repeat columns (5) and (6) from the Difference-in-Difference analysis in Table 4, and column (3) shows the estimate on the sample of states from the 2-stage procedure. The estimate on the interaction terms of the African American and Treatment dummies are positive and significant. Taken together, these results suggest that the effect of controlling for the staggered ending of moratorium policies had the effect of increasing the magnitude of their estimated discriminatory effect on African Americans.

7.2 Heterogeneity by Gender

We showed that the extent of race discrimination was reduced after the eviction moratorium ended. We now turn to studying the heterogeneity of this effect by gender. Figure 4 and Table 8 in the Appendix present the results from the DiD regression similar to specification (2), but with all interactions of the indicator variables for a Male identity, African American or Hispanic identify, and Treatment (a dummy variable for the end of the moratorium). The estimates show that racial discrimination against African Americans and Hispanics reduced significantly specifically for males after the eviction moratorium was lifted.

8 Conclusion

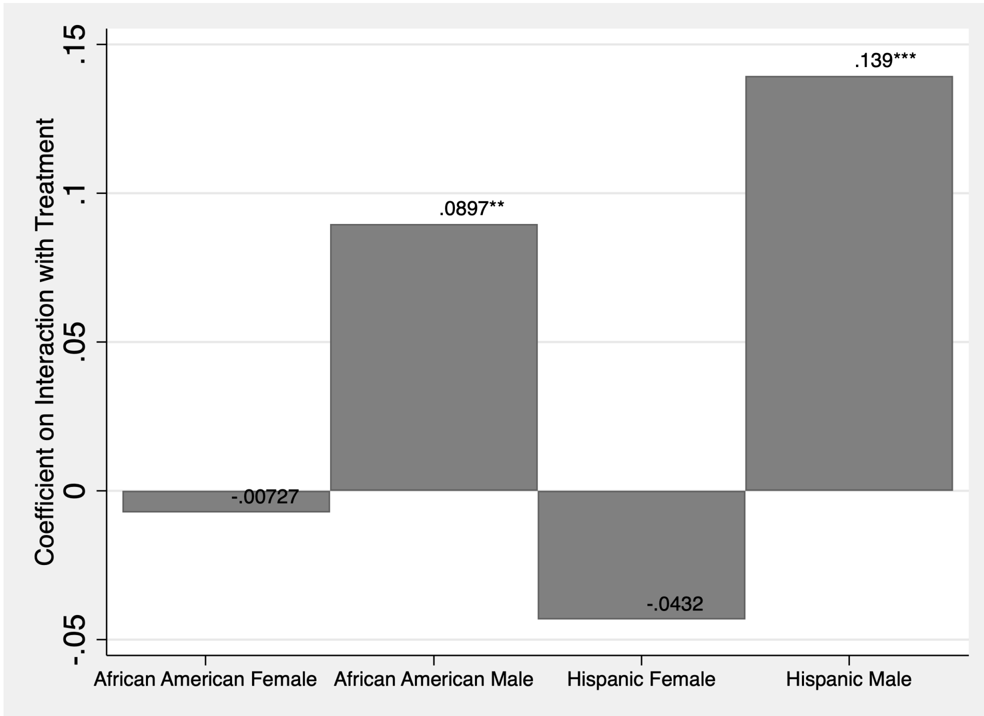
While moratoria on evictions played an important role in preventing the spread of disease during the COVID-19 pandemic and accompanying economic turmoil (Benfer et al., 2021), they may have also exacerbated racial inequities by putting minorities at a disadvantage in the housing search process. Given the lack of affordable housing in many markets, increased discrimination in the housing search process can have important long-run implications. Using data collected as part of a correspondence study conducted by Christensen et al. (2021) during the pandemic, we show that this detrimental impact is particularly important for African-American renters. While eviction moratoria may prove to be important policy tools in responses to future public health emergencies, our results suggest that they need to be accompanied by stricter enforcement of fair housing laws that prohibit discriminatory practices.

Table 7: Difference-in-Difference Estimates on the Sample of States from the Second Stage

	Dependent Variable: Response		
	(1)	(2)	(3)
Treatment	-0.017	-0.017	-0.046
	(0.089)	(0.102)	(0.094)
African American	-0.061***	-0.061***	-0.062***
	(0.007)	(0.013)	(0.007)
African American x Treatment	0.037**	0.037*	0.037**
	(0.018)	(0.021)	(0.018)
Hispanic	-0.033***	-0.033***	-0.032***
	(0.007)	(0.008)	(0.007)
Hispanic x Treatment	0.026	0.026	0.029
	(0.018)	(0.020)	(0.018)
Constant	0.618***	0.606***	0.624***
	(0.021)	(0.022)	(0.022)
Observations	16,913	16,913	16,739
R-squared	0.026	0.026	0.025
Number of address	5,654	5,654	5,596
Weekly FEs	Yes	Yes	Yes
Property FEs	Yes	Yes	Yes
Gender	Yes	Yes	Yes
Educational Level	Yes	Yes	Yes
Inquiry Order	Yes	Yes	Yes
Clustered at State-level	No	Yes	No
States from 2nd Stage	No	No	Yes

Notes: 1) The outcome variable is an indicator of whether a response was received from the property manager, 2) Standard errors in parentheses. 3) ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Figure 4: DiD Estimates on the Interaction of Treatment with Race and Gender Dummies



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Online Appendix

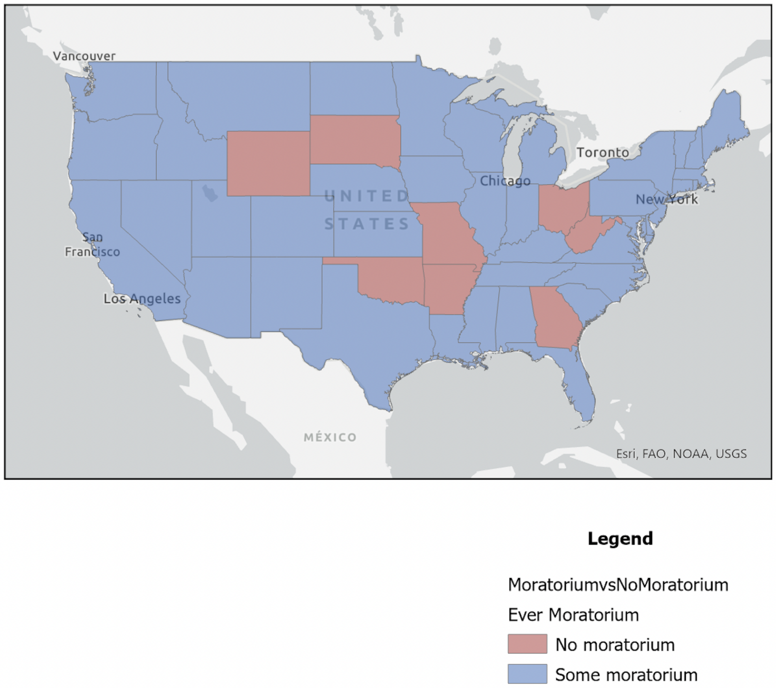
Tables and Figures

Table 8: Estimates By Gender

	Dependent Variable: Response				
	(1)	(2)	(3)	(4)	(5)
Weekly FEs	No	No	No	Yes	Yes
Property FEs	No	No	No	No	Yes
Treatment	-0.070***	-0.072***	-0.076***	-0.017	0.005
	(0.022)	(0.022)	(0.024)	(0.025)	(0.090)
African American	-0.062***	-0.062***	-0.063***	-0.063***	-0.061***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)
African American x Treatment	0.001	0.001	0.016	0.015	-0.007
	(0.026)	(0.026)	(0.028)	(0.028)	(0.027)
Male	-0.041***	-0.041***	-0.042***	-0.043***	-0.043***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Male x Treatment	-0.049*	-0.049*	-0.070**	-0.071**	-0.053*
	(0.028)	(0.028)	(0.030)	(0.030)	(0.029)
African American x Male x Treatment	0.075**	0.075**	0.076*	0.078*	0.090**
	(0.038)	(0.038)	(0.041)	(0.041)	(0.040)
Hispanic	-0.033***	-0.033***	-0.031***	-0.030***	-0.033***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)
Hispanic x Treatment	-0.035	-0.035	-0.036	-0.039	-0.043
	(0.026)	(0.026)	(0.028)	(0.028)	(0.026)
Hispanic x Male x Treatment	0.124***	0.124***	0.143***	0.146***	0.139***
	(0.038)	(0.038)	(0.041)	(0.041)	(0.040)
#Evictions in 2018, thousands			-0.001***	-0.001***	
			(0.000)	(0.000)	
Stringency Index		-0.000	-0.000	0.001	
		(0.000)	(0.000)	(0.001)	
Less Than High School	0.003	0.003	0.001	0.002	0.003
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
High School Graduate	-0.029***	-0.029***	-0.034***	-0.034***	-0.025***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Inquiry Order = 2	-0.036***	-0.036***	-0.035***	-0.042***	-0.042***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Inquiry Order = 3	-0.054***	-0.054***	-0.049***	-0.048***	-0.045***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
Observations	16,913	16,913	15,053	15,053	16,913
Number of addresses	5,654	5,654	5,034	5,034	5,654

Figure 5: Eviction Moratoria across the U.S.

(a) States that Enacted Moratoria



(b) The First Week of the Eviction Moratoria Across U.S.