Landlord Rights, Evictions, and Rent Affordability

N. Edward Coulson, University of California, Irvine *
Thao Le, Georgia State University †
Lily Shen, Clemson University ‡

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PRELIMINARY DRAFT

Abstract

Policymakers have long been seeking to reduce eviction-induced poverty by enacting eviction control ordinances. However, overly strict landlord regulations can impose unintended negative consequences and ultimately make rental houses less affordable. In this paper, we provide a theoretical demonstration that strict landlord regulations increase the cost of evictions and eventually reduce rent affordability. To test this prediction, we construct an index to measure the level of legal protection of landlord rights for each state in the U.S. On the one hand, we find that rental houses are more affordable in areas where landlords have stronger rights: a one-unit increase in the landlord-rights index (i.e., more landlord-friendly) is associated with a 1.7 percent decrease in rents and a 5.7 percent increase in vacancy rate. On the other hand, it is associated with a 10 percent increase in eviction rates. Taken together, our findings highlight an important trade-off between tenant protection and rent affordability.

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*UCI Paul Merage School of Business, University of California, Irvine, Irvine, CA
†J. Mack Robinson College of Business, Georgia State University, Atlanta, GA
‡Department of Finance, Clemson University, Clemson, SC

1 Introduction

"Eviction isn't just a condition of poverty; it's a cause of poverty."

–Matthew Desmond, *Evicted*

Every year, approximately 2.3 million evictions are filed in the U.S. Every minute, four renters in the U.S. are forced out of their homes[1]. In response to the eviction crisis, the recent attention of urban housing policy has been shifted to increasing tenant protections and restricting no-cause evictions (Desmond, 2012, Desmond, 2016).

Both sociologists and economists have developed a long literature to examine the social and economic implications of landlord-tenant relationship. On one hand, sociologists have documented considerable evidence that eviction-related residential mobility leads to negative consequences, including adolescent violence (Sharkey and Sampson, 2010), poor school performance (Pribesh and Downey 1999), and damages on the physical and psychological well-being (Dong et al., 2005 and Oishi, 2010). Moreover, these eviction-induced consequences are severe for the poor, minorities, women and children (Desmond, 2012, Desmond, 2016, South and Crowder, 1998, Sampson and Sharkey, 2008). On the other hand, economics studies focus on how eviction controls and landlord regulations affect rent affordability. Borsch-Supan (1986) and Bennett (2016) show that tenants pay premiums in markets where landlords rights are not well protected. The underlying motive is that landlords charge a rent premium to compensate for the potential risks of drawing unpleasant tenants.

Since overly strict landlord regulations may impose unintended spillover effects that impair rent affordability, it is essential for policymakers to understand the delicate balance between the strictness of landlord regulations, evictions, and rent affordability, to ultimately increase the tenants' welfare. The extant economics literature has been silent on the direct impact of evictions on rent affordability due to the absence of a comprehensive database on landlord regulations as well as eviction outcomes.

[1]First-Ever Evictions Database `https://www.npr.org/2018/04/12/601783346/first-ever-evictions-database-shows-were-in-the-middle-of-a-housing-crisis`

In this study, we bridge the literature gap by studying the relationship between landlord regulations, evictions, and rent affordability. We develop a simple search model in which it is costly to evict bad tenants. We show that a decrease in eviction cost will lead to a lower rent, higher supply of rental housing, higher vacancy rate, lower homeless rate, and a potentially higher eviction rate in equilibrium. We then empirically test these predictions using two new novel databases: a hand collected database for state-level landlord regulations, and an eviction database released by the Eviction Lab in May 2018.

To proxy for the cost of eviction, we survey landlord-tenant laws in 50 states across the U.S and the District of Columbia, and create a state-level index to measure the level of legal protection of landlord rights in each state. Following the classic legal studies literature on tenant eviction protections (Bennett (2016), Manheim 1989), we identify the top ten legal provisions that are most important in landlord-tenant relationships. For each provision, we assign a score of 1 if a state is more friendly towards landlords than the average state. We then take the sum of all ten provisions as our Landlord-rights index. It from 0 to 10, with a higher index value indicating more legal protection for landlords than tenants, which in turn means a lower cost of eviction for landlords.

We first use this index to test the effect of landlord rights on rent affordability. Consistent with our theoretical prediction, we find rental houses are more affordable where landlords have better legal protection. In particular, a one unit increase in the landlord-rights index is associated with a 1.7 percent decrease in rent prices. We also test several other housing outcomes, including the supply of rental housing, vacancy rate, and homeless rate. It is heartening to find that the empirical results again support all predictions from our theoretical model regarding the relationship between landlord regulations and these outcomes.

In addition, we ask whether more landlord protection is correlated with higher eviction rates as indicated by our model. Not surprising, we find that eviction requests are more likely to be supported by judges in landlord-friendly regions. A one unit increase in the landlord-rights index is positively correlated with a 10 percent increase in eviction rates.

Together with the findings on rental outcomes, our results suggest that stricter landlord regulations may help protect tenants from eviction and its many associated hardships, but at the cost of higher rents and lower supply. In fact, it may even increase homelessness as a net result. Our findings thus have important implications for landlord-tenant regulations that should be of great interest to policymakers.

The rest of the paper is organized as follows. We introduce the theoretical motivation in Section 2. We discuss the empirical methodology in Section 3. We describe and present the descriptive statistics of our eviction data and landlord regulation data in Section 4. We report our empirical findings in Section 5. Section 6 concludes the paper.

2 Theoretical Motivation

In this section we construct a search model in manner of Pissarides (2000) applied to the rental housing market. Landlords own a single unit, which is characterized by one of two states, occupancy (O), or vacancy (V). If the unit is currently vacant, the landlord pays carrying costs, c, each period of vacancy. They match with tenants, at rate λ, to be determined endogenously, and bargain over the nominal rent, R. The tenant's quality is then revealed. Tenants are either good or bad with probability p. If bad, the landlord must pay y in extra maintenance costs each period; good tenants impose no such cost. With r as the discount rate, and π_i, where $i\epsilon\{O, V\}$ as the present value of future net income, the flow value function of the landlord in the vacancy state is given by:

$$r\pi_V = -c + \lambda(\mathbb{E}\pi_O - \pi_V) \tag{1}$$

When the unit is occupied by a tenant, and the type y is revealed, the landlord chooses to either try and evict the tenant or not. If the tenant is good, no eviction is attempted,

and the flow value of utility is:

$$r\pi_O(y; good) = R + \delta(\pi_V - \pi_O(y; good)) \tag{2}$$

where δ is the exogenous probability of detachment. Note that (2) becomes:

$$\pi_O(y; good) = \frac{R + \delta\pi_V}{r + \delta} \tag{3}$$

If the tenant is bad, the landlord may choose to evict or not. If eviction is not chosen the period utility is:

$$r\pi_O(y; keep) = (R - y) + \delta(\pi_V - \pi_O(y; keep)) \tag{4}$$

The landlord may alternatively try to evict. In this case the landlord pays a per period fee of d, and thereby raises the separation rate by an exogenous amount ε, and we have:

$$r\pi_O(y; evict) = (R - y - d) + (\delta + \varepsilon)(\pi_V - \pi_O(y; evict)) \tag{5}$$

Rewriting (4) and (5) respectively yields:

$$\pi_O(y; keep) = \frac{R - y + \delta\pi_V}{r + \delta} \tag{6}$$

and

$$\pi_O(y; evict) = \frac{R - y - d + (\delta + \varepsilon)\pi_V}{r + \delta + \varepsilon} \tag{7}$$

Eviction will occur when the present value of profits from eviction are greater than that of keeping the tenant. Combining (6) and (7), this condition can be written as:

$$R - y < r\pi_V - \frac{d(r + \delta)}{\varepsilon} \tag{8}$$

The left hand side is net rent. The right hand side is a parameter cluster that represents

the net flow benefit of eviction (not including the lost rent on the left hand side). This net benefit is higher when the probability of successful eviction is higher, or when the value of a vacancy is higher, and is lower when the cost of eviction is higher, or when the detachment rate is higher. In the latter case, a higher probability that the (bad) tenant will leave anyway lowers the value of deliberately evicting him.

For now we assume that (8) holds, in order to obtain comparative static impacts of eviction cost d. The expected gains from matching with a tenant then becomes:

$$\mathbb{E}\pi_O - \pi_V = (1-p)\,\frac{R+\delta\pi_V}{r+\delta} + p\frac{R-y-d+(\delta+\varepsilon)\,\pi_V}{r+\delta+\varepsilon} - \pi_V \tag{9}$$

$$= \frac{(R-r\pi_V)\,(r+\delta+(1-p)\,\varepsilon) - p(d+y)(r+\delta)}{(r+\delta)(r+\delta+\varepsilon)} \tag{10}$$

We can now replace $r\pi_V$ with its value from (1) and rearrange (10) to get:

$$\mathbb{E}\pi_O - \pi_V = \frac{(R+c)\,(r+\delta+\varepsilon\,(1-p)) - p(d+y)(r+\delta)}{(r+\delta)\,(r+\delta+\varepsilon) + \lambda((r+\delta+\varepsilon\,(1-p))} \tag{11}$$

$$= \frac{(R+c)\,\theta_2 - \theta_3}{\theta_1 + \theta_2\lambda} \tag{12}$$

where $\theta_1 = (r+\delta)\,(r+\delta+\varepsilon)$, $\theta_2 = r+\delta+\varepsilon\,(1-p)$ and $\theta_3(d) = p(d+y)(r+\delta)$

Tenants are housed (H) or unhoused (U). Recalling that their draw of y is unknown to them before they are housed, we let J described their lifetime utility from any given state and write the flow value of being unhoused:

$$rJ_U = \mu(\mathbb{E}J_H - J_U) \tag{13}$$

Note that cash flow in the unhoused state is normalized to zero. The (endogenous) matching rate of tenants to landlords is μ. Once they are housed, their draw of y is revealed and they observe whether the landlord is trying to evict them. With Z notating the benefit of being

housed, we have:

$$rJ_H(y; stay) = (Z - R) + \delta(J_U - J_H(Y; stay)) \tag{14}$$

$$rJ_H(y; evict) = (Z - R) + (\delta + \varepsilon)(J_U - J_H(Y; evict)) \tag{15}$$

As a simplification, we assume that tenants pay full rent. ; the lack of care, y, does not create benefit for the tenant if they are revealed to be bad. This prevents tenants from strategically acting like bad tenants in no-eviction markets. An assumption to justify this would be that y represents lack of care, but that the tenant receives no (leisure) benefit from this lack.

To determine the expectation of lifetime utility from being housed, first write, using (14) and (15) respectively:

$$J_H(y; stay) = \frac{(Z - R) + \delta J_U}{r + \delta} \tag{16}$$

and

$$J_H(y; evict) = \frac{(Z - R) + (\delta + \varepsilon) J_U}{r + \delta + \varepsilon} \tag{17}$$

So that, as long as eviction is possible, and remembering that the tenant does not know their quality ahead of the match, we have:

$$\mathbb{E}J_H - J_U = p\frac{(Z - R) + (\delta + \varepsilon)J_U}{r + \delta + \varepsilon} + (1 - p)\frac{(Z - R) + \delta J_U}{r + \delta} - J_U \tag{18}$$

$$= \frac{(r + \delta + (1 - p)\varepsilon)((Z - R) - rJ_U)}{(r + \delta)(r + \delta + \varepsilon)} \tag{19}$$

Substitute the expression for the flow value of the unhoused to get, from inserting (13) into

(18) and (19) respectively:

$$(\mathbb{E}J_H - J_U) = \frac{\theta_2(Z-R)}{\theta_1 + \theta_2\mu} \tag{20}$$

Rents are determined in a Nash Bargain which (by assumption of equal bargaining power) equates the gains from agreement obtained by landlord and tenant.

$$\frac{(R+c)\,\theta_2 - \theta_3}{\theta_1 + \theta_2\lambda} = \frac{\theta_2(Z-R)}{\theta_1 + \theta_2\mu} \tag{21}$$

which yields rent as a function of the two endogenous contact rates:

$$R = \frac{(\theta_3 - c\theta_2)(\theta_1 + \theta_2\mu) + Z(\theta_1 + \theta_2\lambda)\theta_2}{\theta_2(2\theta_1 + \theta_2\,(\lambda+\mu))} = R(\lambda,\mu) \tag{22}$$

where the derivative of R with respect to λ is positive and with respect to μ is negative, under the condition that $(\theta_3 - c\theta_2) < 0$. A sufficient condition for this is $p\,(d+y) < c$ which from (12) is easily seen to be a sufficient condition for landlord entry into the market. These are standard results from search and bargaining models, since an increase in one's contact rate raises one's bargaining power and tilts the rent in a favorable direction.

We assume free entry, such that the profits from holding a vacancy equals the fixed costs of entering the market:

$$\pi_V = \varphi \tag{23}$$

From (1), (9), (22) and (23) we get:

$$\frac{r\varphi + c}{\lambda} = \frac{(R(\lambda,\mu) + c)\,\theta_2 - \theta_3(d)}{\theta_1 + \theta_2\lambda} \tag{24}$$

which defines an equilibrium entry, zero-profit condition in the two contact rates. In the (μ,λ)-space it is straightforward to show that the implicit function derived from is upward sloping. An increase in the tenant contact rate necessitates an increase in the landlord

contact rate (via landlord exit, as discussed below) in order to return to zero profit.

There are L landlords whose units are vacant or occupied, and T tenants, housed or unhoused, measured on a continuum:

$$L = L_V + L_O \tag{25}$$

$$T = T_H + T_U \tag{26}$$

Note that T is assumed to be exogenous in order to anchor the model, but L is determined endogenously, as the number of available units must satisfy a zero profit condition. The number of matches in any given period is generated by a standard matching function:

$$\lambda L_V = \mu T_U = M\left(L_V, T_U\right) \tag{27}$$

The matching function M is assumed to be constant returns to scale so that:

$$\lambda = M(1, \lambda/\mu) \tag{28}$$

where λ/μ is "market tightness". It is straightforward to see that (28) implicitly defines a downward sloping function in (μ, λ) space, which we refer to as the matching condition.

Given certain mild conditions on the matching function (Coulson, Laing and Wang (2001)) there exists a unique solution to ZP and the matching condition that establishes the equilibrium values of the two contact rates. The comparative statics of the model are then very intuitive to establish (Figure **??**). A change in any of the model's parameters implies a shift in the zero profit function that re-equilibrates μ and λ.

Our main interest is in the comparative static responses to changes in d, the cost of eviction. For ease of presentation we eschew comparative static analysis of changes in ε. We can therefore interpret d as the cost of obtaining the given eviction rate. Examination of (24)

indicates that a decrease in d will shift down the zero profit line. For any given μ, a lower d requires a decrease in λ to maintain zero profits. As Figure **??** therefore shows, a drop in d implies both lower λ and higher μ. This in turn implies from (22) a lower equilibrium rent.

In order to say more about quantities, we can invoke the assumption of a steady state. A steady state equilibrium requires that the number of tenants that enter and exit the housed and unhoused states is equal:

$$(\delta + p\varepsilon)\, T_H = \mu T_U \tag{29}$$

Similarly, the number of landlords that enter and exit the vacant and occupied states must be equal:

$$(\delta + p\varepsilon)\, L_O = \lambda L_V \tag{30}$$

We define the homeless rate as the percentage of tenants in the unhoused state:

$$Homeless\ rate = \frac{T_U}{T_U + T_H} \tag{31}$$

And from (29) we have that this is:

$$Homeless\ rate = \frac{\delta + p\varepsilon}{\delta + p\varepsilon + \mu} \tag{32}$$

so that a decrease in the cost of eviction drives up the tenant contact rate and decreases homelessness. This is paradoxical, but works through the eviction cost's affect on the housing supply, which we turn to momentarily.

First, we define the vacancy rate for landlords as the percentage of units that are vacant, and use (30) to find:

$$Vacancy\ rate = \frac{L_V}{L_V + L_O} = \frac{\delta + p\varepsilon}{\delta + p\varepsilon + \lambda} \tag{33}$$

So that a decrease in d lowers the landlord contact rate and increases the vacancy rate, again through housing supply.

Housing supply is the sum of occupied and vacant units:

$$Housing\ supply = L_O + L_V \tag{34}$$

$$= \left(1 + \frac{\lambda}{\delta + p\varepsilon}\right) L_V \tag{35}$$

Using (27)

$$= \left(1 + \frac{\lambda}{\delta + p\varepsilon}\right) (\frac{\mu}{\lambda}) T_U \tag{36}$$

And (29)

$$= \left(\frac{\delta + p\varepsilon + \lambda}{\delta + p\varepsilon + \mu}\right) \left(\frac{\mu}{\lambda}\right) T \tag{37}$$

The model is anchored to an exogenous population, T. With that, equilibrium housing supply is lower with a higher landlord contact rate and higher with a higher tenant contact rate. Therefore a lower cost of eviction increases housing supply.

Finally, note that the eviction rate itself, ε, is invariant to d because it is exogenous. Nevertheless our model does deliver the fact that a higher cost of d can, in some circumstances, lower evictions to zero when d rises by a sufficient amount to overturn inequality (8).

To summarize, a decrease in d, or as we will interpret it in the empirical work below, an increase in landlord right protection, has the following effect:

1. A decrease in rents
2. An increase in housing supply
3. A higher vacancy rate
4. A lower homeless rate

5. A potentially higher eviction rate

In the next section we turn to the empirical testing of these hypotheses.

3 Empirical Methodology

We first test for the relationship between landlord-tenants laws and rent affordability, estimating the following equation:

$$\begin{aligned} RentVariable_c = \alpha + \beta LandlordIndex_s + \theta_1 Ln(Population)_c + \theta_2 PovertyRate_c \\ +\theta_3 MedianRooms_c + \theta_4 Built2010_c + \theta_5 PropertyTax_c + \theta_6 WinterTemp_s + \varepsilon_c \end{aligned} \tag{38}$$

The dependent variable in Equation (38) is the median gross rent in a city, as reported by the Census Bureau, defined as the contract rent plus the estimated average monthly cost of utilities. We also verify our results using county-level rent data from Zillow Our variable of interest is the Landlord-rights Index. If more protection for the landlord leads to lower rent, we will observe a negative β coefficient.

$LandlordIndex_s$ is the state-level landlord-rights index that we describe in details in Section 4.1. This model also accounts for a full set of control variables, including local demographics characteristics such as population, population growth, median household income, and the growth of household income. We also control for regional property characteristics reported by the Census Bureau, namely the median number of rooms per rental unit, the share of rental properties built after the year 2010, and the median property tax. Finally, we include the average temperature in the winter as it is a strong predictor of a city's growth in prior literature (see, for example, Glaeser, 2005, Glaeser, 2011). This data set is provided by the National Centers for Environmental Information.[2]

Next, we test for the impact of landlord rights on rental housing supply, vacancy rate,

[2]https://www.ncdc.noaa.gov/cdo-web/

and homeless rate using the following linear model:

$$Dep.Var_c = \alpha + \beta LandlordIndex_s + \theta_1 Demographics_c + \theta_2 PropertyControl_c + \varepsilon_c \quad (39)$$

The dependent variables are measures of housing outcomes, including (1) the number of rental housing units (per 100 residents), (2) vacancy rate, or (3) homeless rate. Similar to the rent model, we control for a wide range of demographic and property characteristics, as well as the me dian winter temperature.

Finally, we test for the impact of regulations on evictions, estimating the following linear model:

$$\begin{aligned} Eviction_c = \alpha + \beta LandlordIndex_s + \theta_1 Ln(Population)_c + \theta_2 PovertyRate(\%)_c \\ + \theta_3 RentBurden(\%)n_c + \theta_4 RenterOccupied(\%)_c + \theta_5 White(\%)_c + \varepsilon_c \end{aligned} \quad (40)$$

The dependent variable is the eviction outcomes at the city level. $LandlordIndex_s$ is the state-level landlord-rights index. $PovertyRate$ is the percentage of the local population whose household income for the past 12 months was below the poverty level. $RentBurden_c$ is the city level median gross rent as a percentage of the household income. $RenterOccupied_c$ is the percentage of renter-occupied houses in the city. $White_c$ is the percentage of Caucasians in the local population. The standard errors are clustered at the state level.

The variable of interest here is again the coefficient estimate for the rent index (β). We hypothesize that the covariate estimate would be positively and statistically significantly correlated with the landlord-rights index.

4 Data and Descriptive Statistics

4.1 Landlord-Tenant Laws by State

To study the relationship between landlord–tenant laws and evictions, we first need to develop a quantitative measure of landlord and tenant rights in each state. We conducted a comprehensive survey of the U.S landlord-tenant laws, and hand collected data on statutes regarding several important aspects of landlord and tenant rights. In particular, we focus on ten common aspects: (1) maximum security deposit, (2) deadlines for returning security deposit, (3) rent increase notice, (4) rent withholding policy, (5) repair and deduct policy, (6) landlord's access to the property, (7) termination notice for non-payment, (8) regular termination notices for tenancies at will, (9) termination notice for lease violations, and (10) abandoned tenant property. Table 1 provides their definitions and examples.

We then developed a simple, binary scoring system to measure whether a particular state is more landlord- or tenant-friendly in each of these aspects. To understand how it works, let's examine the first law provision in our list - the maximum security deposit a landlord can request from the tenant. Among the 50 states and the District of Columbia included in this study, 25 states limit the security deposit amount to the equivalent of 1-1.5 months rent. The remaining 26 states either have a maximum of 2 months or do not have any statues governing this aspect.[3] Each state in the former group has a score of 0 while each state in the latter group receives 1. Thus, a score of 1 indicates that the state awards more power to landlords than tenants, or put it differently, the state is more landlord-friendly in that aspect. As another example, let's consider the law provision requiring landlords to give tenants advance notices for rent increases, which can range from as low as 15 days (Idaho) to 90 days (Oregon), with an average of 34 days. If a state requires a notice less than 34 days in advance or has no statutory requirements, it receives a score of 1 for this category and 0 otherwise.

[3]We consider states that do not have any statues or provisions on the issues in question to favor landlords to tenants.

In general, for each of the ten law provisions, we assign a score of 1 if a state favors landlords compared to the average of all states in the sample. For each state, we then take the sum of all ten categories as its landlord-rights index. This index therefore ranges from a minimum of 0 to a maximum of 10, and the higher the index value, the more landlord-friendly a state is. Table 2 reports the score for each of the ten law provisions as well as the landlord-rights index for each state. Figure 2 also maps the distribution of the landlord-rights index for the contiguous U.S. states. The average index value is 4.0, implying that on average state laws slightly favor tenants to landlords. There are 30 states with index values less than 5, which are considered tenant-friendly states. We regard 15 states with index values higher than 5 as landlord-friendly states, and the remaining 6 states are neutral. The most tenant-friendly states has the lowest index value of 1, which include Alaska, Arizona, Hawaii, Kansas, Nevada, Rhode Islands, and Vermont. On the contrary, Florida, Idaho and West Virginia are the most landlord-friendly states with an index value of 8.

4.2 Eviction Lab Data

We employ a novel database released by the Eviction Lab at Princeton University in May 2018. This is the first comprehensive national eviction database compiled using more than 80 million formal eviction records, including eviction requests from landlords and eviction orders from judges, collected from the courts. The Eviction Lab data contain all the known information on the number of evictions filed in the United States and made publicly available by municipalities[4]. The data are available at the state, county, city, census tract and census block level.

In this research, we are primarily interested in two measures, namely eviction filing rates and eviction rates. An eviction filing rate is the ratio of the number of evictions filed in an area over the number of renter-occupied homes in that area. This measure counts all eviction cases filed in an area, including multiple lawsuits filed against the same address in the same

[4]Eviction Lab "Methodology Report" `https://evictionlab.org/methods/#more-questions`

year. On the other hand, an eviction rate is the subset of those homes that received an eviction judgment in which renters were ordered to leave, which counts only single, unique addresses who received an eviction judgment in a year. Figure 3 shows the average poverty rates and eviction rates for the contiguous U.S. states in 2016. The size of the red circles represents eviction rate. South Carolina exhibits the highest rate at 3.8% while the lowest rate 0.01% is recorded in New Jersey.

Table 3 presents their summary statistics. Our sample includes 3,725 U.S. cities in 2016. The average filing rate and eviction rate are 5.73% and 2.14% respectively. Note that the maximum filing rate is over 278% due to multiple filing counts. The maximum eviction rate of 24% is recorded in Ladson, South Carolina.

4.3 Rent Affordability and Other Supporting Data

The city-level median rent data are from the Census. We also obtain county-level median rent and asking rent data from the Zillow Rent Index (ZRI). The ZRI median rent and the rent per square feet are computed across all homes in a county, not only those that are currently for rent. The vacancy data and homeless rate data are from the Census. The other demographic data are collected from several sources, including the U.S. Census and ESRI Business Analyst. The city-level climate data are from the National Centers for Environmental Information.

According to Table 3, the median gross rent from Census and Zillow is comparable, ranging from 1.03 thousand to 1.09 thousand. The median asking rent is on average $300 higher than the gross rent. Regarding other demographic characteristics, the average city in our sample has a population of 76,276 persons, poverty rate of 11.82%, renter-occupied share of 38.45%, rent burden of 31.31%, white population share of 62.57%, and average winter temperature of 38.6 Fahrenheit degrees. About 2.34% of the rental units were built after 2010. The average rental unit in our sample has 5.59 rooms, and its asking and contract rents are $1,050 and $1,006, respectively. Figure 4 plots the state-level average median gross

rent.

5 Empirical Results

5.1 Rent Affordability

We begin with relating our landlord-rights index to rent affordability by estimating Equation 38. We hypothesize that landlord may perceive lower risks associated with rental activities in areas where the laws are on their side, implying a negative relationship between our index and rent levels.

Table 4 reports the results. The dependent variable in the first two columns is the log of the median gross rent in a city, which is the contract rent plus the estimated utility cost. The coefficient estimate of our variable of interest is negative and statistically significant, as indicated by the model, suggesting that every one-point increase in the index is associated with a $18 in monthly gross rent. Given that the average median rent in our sample is $1,032,this is equivalent to a 1.7% decrease in rent. More notably, it amounts to a 12% difference in rent when we compare the most landlord-friendly states (index value of 8) to the most tenant-friendly states (index value of 1). In column (2)-(3), we replace the dependent variable with the ZRIs, and our coefficient of interest is negative. Other control variables are also consistent with our economic intuition. Cities with higher population and warmer winter weather tend to have higher rent levels. Furthermore, rents are also higher in cities where rental units have more rooms or were built more recently. Conversely, we find the poverty rate is negatively related to rent levels. In the last two columns, we use the median asking rent from Zillow in place of contract rent and obtain similar results.

5.2 Rental Housing Supply, Vacancy, and Homeless Rate

We next discuss our empirical estimates for the relationship between Landlord-Rights and several housing outcomes. Column (1) of Table 5 show that landlord-right is positively

correlated with the volume of rental units supply. Although this is not statistically significant, the direction of the coefficient is consistent with our theoretical prediction. Column (2) shows that vacancy rates tend to be higher in areas with higher landlord protection, which also support our theoretical prediction. The magnitude of the coefficient suggests that on average, we can expect a 0.33 percentage points increase in vacancy rate for every one unit increase in the index. It amounts to a 5.7% increase for the average city in our sample. In the last column, although the estimate is too imprecise to be statistically significant, we again find that the sign of the coefficient is consistent with our the theoretical prediction of a negative relationship between landlord protection and homeless rate.

5.3 Evictions

Table 6 presents our baseline results on the relationship between eviction and landlord-tenant laws as specified in Equation 40. When we use eviction filing rate as the dependent variables in the first two columns, none of the coefficients are statistically significant. As described earlier, the filing rate includes multiple fillings against the same address, making it a rather noisy measure. We thus find that these insignificant results are unsurprising. On the other hand, the eviction rate variable only counts unique eviction judgments. When it is used as the dependent variable in the third column, the coefficient on the landlord-rights index is significant at the 5% level, and its magnitude only decreases slightly when we control for several city-level factors in the last column. The coefficient suggests that every one unit increase in the landlord-rights index is associated with a 0.2 percentage point increase in eviction rate. Given that the average eviction rate across all cities in our sample is 2.1% (Table 3), this effect is undoubtedly economically large, equivalent to a 10% increase in eviction rate. Overall, the results in this table strongly support our hypothesis that landlord-tenant regulations play an important role in explaining the eviction rate, even after controlling for several other factors.

In summary, our empirical results in this section suggest that while landlord-friendly

cities, on average, have higher eviction rates than tenant-friendly areas, the former has better rent affordability than the latter. Thus, it is important for policy makers to recognize the delicate trade-off between tenant protections and rent affordability: imposing strict landlord regulations may protect tenants from potential hardships associated with eviction, but at the cost of higher overall rent levels for everyone.

6 Conclusion

Every minute, four renters are evicted from their rental homes. Policymakers are seeking solutions to reduce the level of eviction-triggered residential mobility. This study provides economic analyses that shed light on the net impact of landlord-tenant laws on eviction and rent affordability. Our paper offers three major contributions to the real estate literature on affordable rent. First, we are the first to study the net impact of the landlord-tenant relationship on rent affordability using both ex ante regulations and ex post eviction judgments. Second, we are the first to construct a novel state-level index to proxy for the strictness of landlord regulations. Third, we provide both theoretical evidence and empirical evidence showcasing the relationship between landlord rights, eviction rates, and rent prices.

On the one hand, we find that rent levels and vacancy rate are strongly correlated with the extent of landlord protection: a one unit increase in the landlord-rights index is associated with a 1.7% decrease in rent prices and a 5.7% increase in vacancy rate. On the other hand, our analysis on landlord rights and eviction outcomes reveals that a one unit increase in the landlord-rights index is associated with a 10% increase in eviction rates. Hence, our findings highlight an important trade-off between tenant protections and rent affordability: imposing strict landlord regulations may protect tenants from potential hardships associated with eviction, but at the cost of higher overall rent levels for everyone. This has important implications for landlord-tenants regulations that should be of great interest to policymakers.

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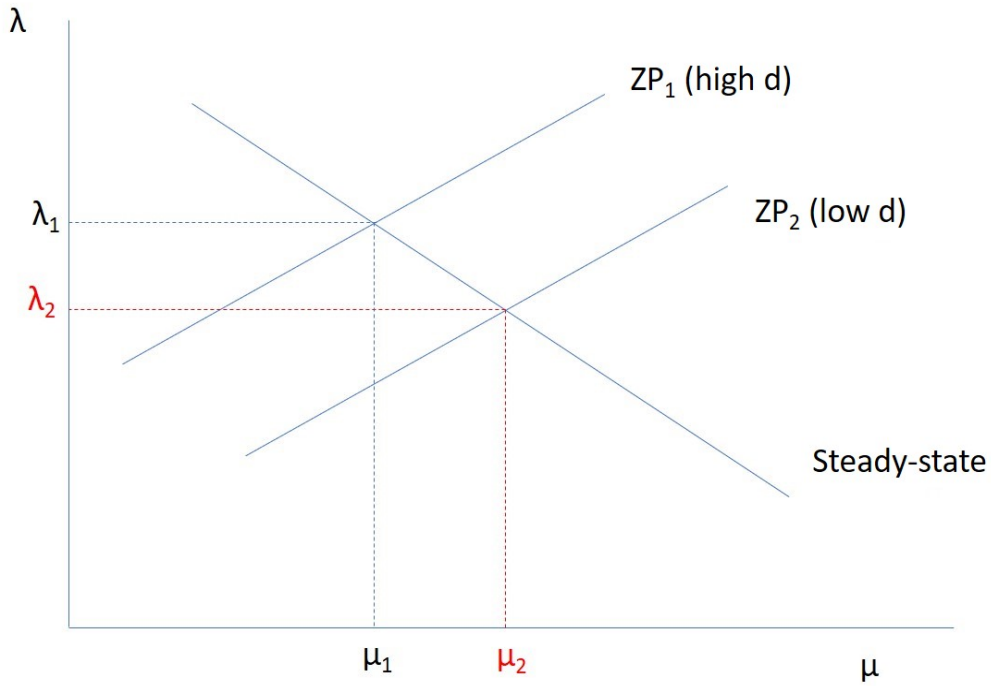
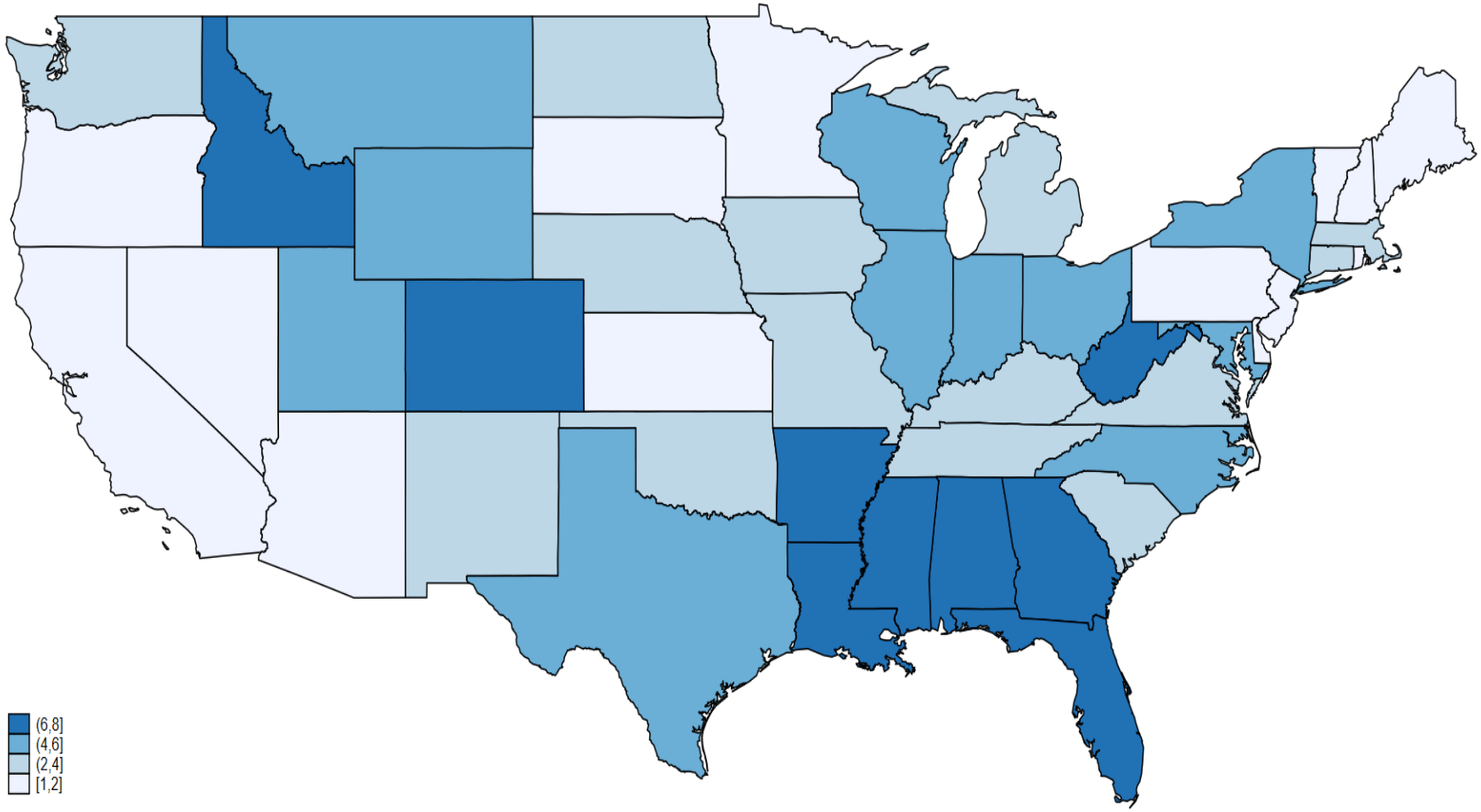
Figure 1: Effect of a Rise in Eviction Cost on Contact Rates



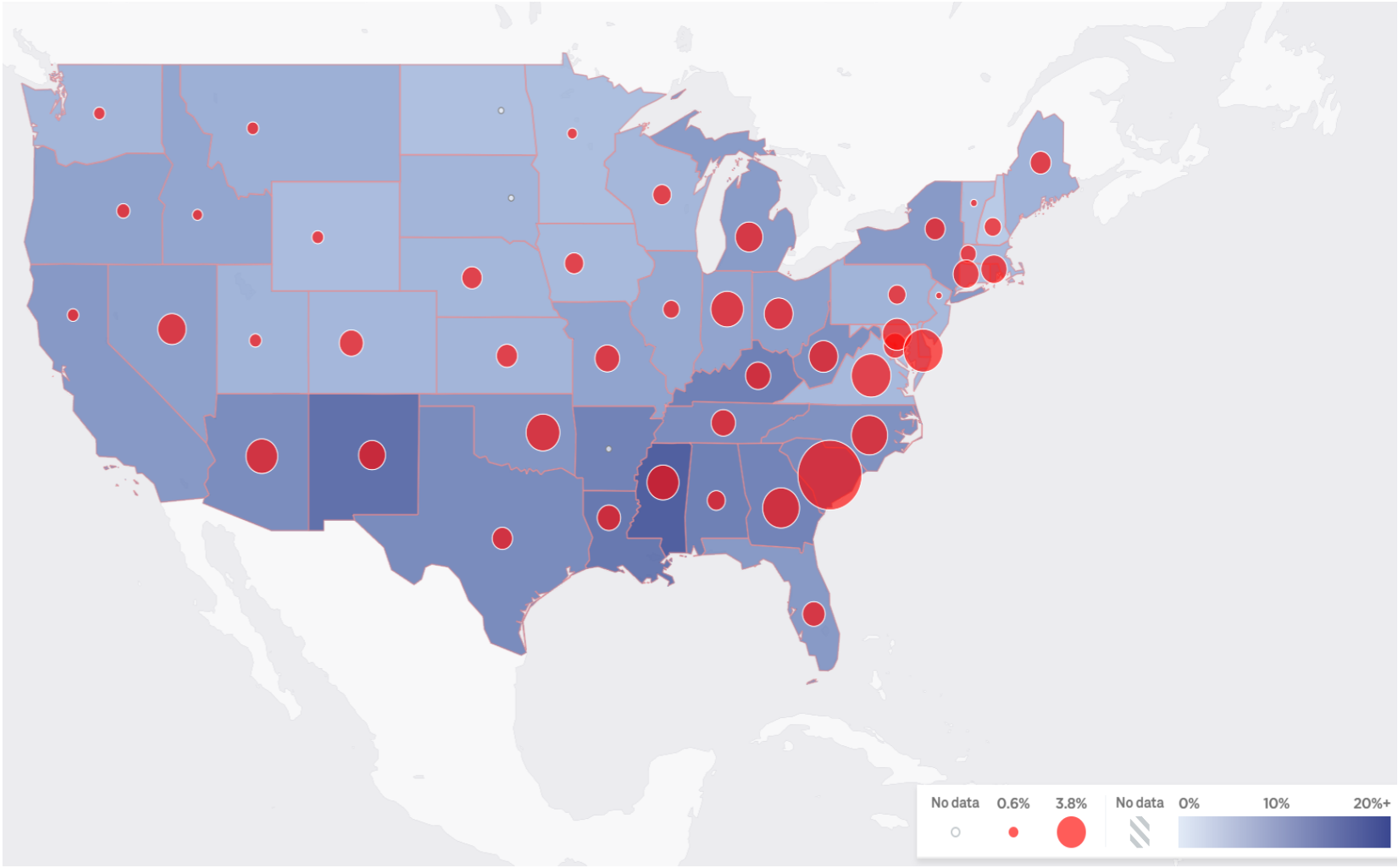
Notes: This figure demonstrates the effect of a decrease in d (eviction cost) on the contact rates for tenants (μ), and landlords (λ).

Figure 2: Landlord-Rights Index by State



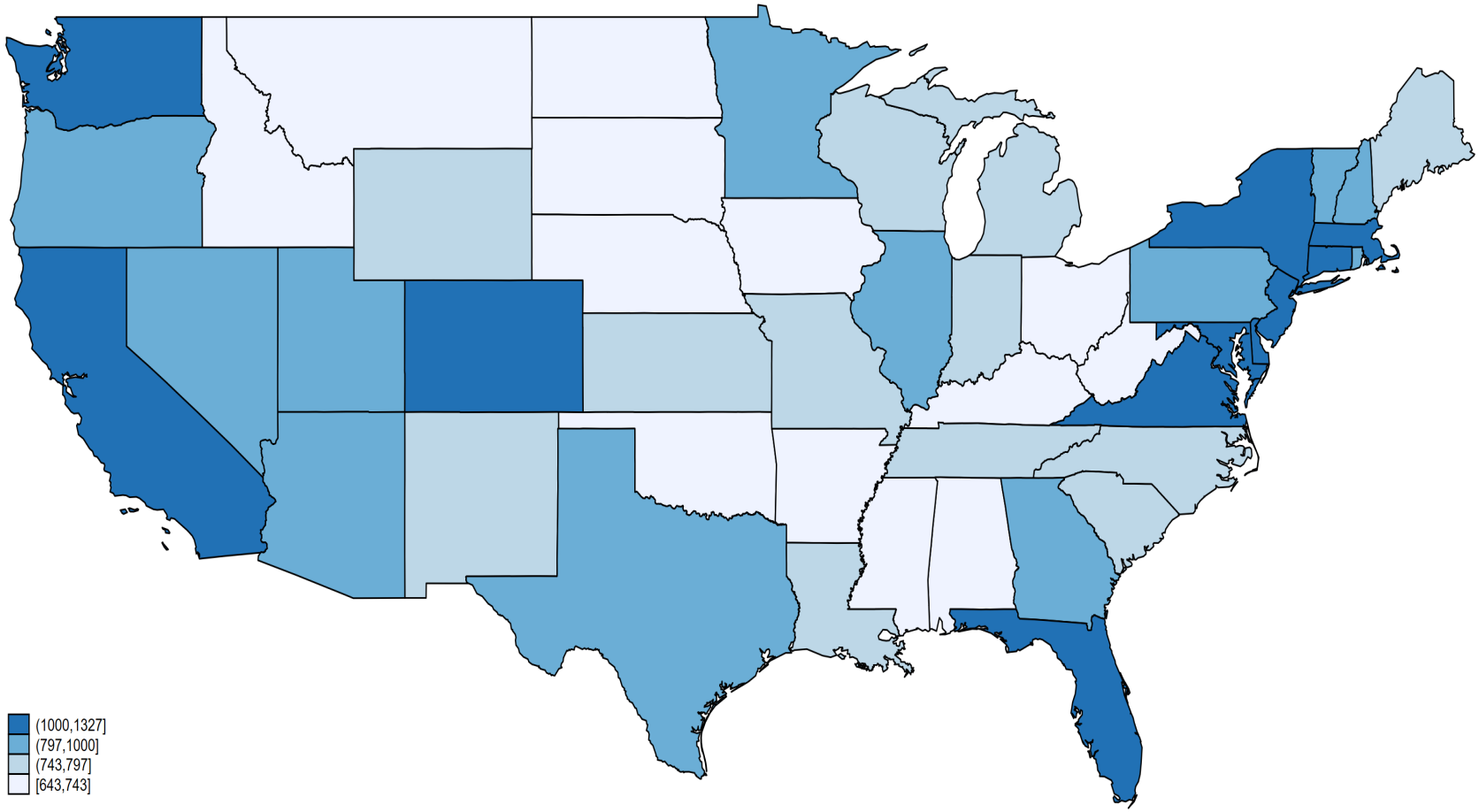
Notes: This figure features a map of contiguous U.S. states with color-coding to highlight the landlord-rights index value in each state. The data used in this map are shown in the last column of Table 2.

Figure 3: Eviction Rate



Notes: This figure features a map of contiguous U.S. states with color-coding to highlight the poverty rate and eviction rate in each state. The blue shades represent poverty rate, and the size of the red circles represents eviction rate. This map is obtained from Eviction Lab at Princeton University.

Figure 4: Median Gross Rent



Notes: This figure features a map of contiguous U.S. states with color-coding to highlight the levels of Median Rent in each state.

Table 1: Definition of Landlord-Tenant Law Provisions

Abbreviation	Definition	Example
Max Deposit	Maximum security deposit for an unfurnished apartment on a one year lease	1 month rent
Deposit Return	Deadline for returning security deposit when no deductions are imposed by landlord	30 days
Rent Increase Notice	Rent increase notice for month-to-month contracts	30 days in advance
Withhold Rent	Tenant has the option to withhold rent for failure to provide essential services	Yes/No
Repair Deduct	Tenant is allowed to repair and deduct costs from rent	Yes/No
Entry Notice	Required notice needed from landlord before entry	24 hours in advance
Nonpayment Termination	Termination notice required for nonpayment of rent	5 days
Tenant at will Termination	Regular termination notice for month-to-month lease	30 days
Lease Violation Termination	Termination notice required for lease violation	5 days
Abandoned Property	How much time the tenant has to recover abandoned property after receiving notice	45 days

Notes: This table provides the definition of the ten law provisions regarding landlord-tenant relationships used to construct our landlord-rights index

Table 2: Landlord Rights by States

State	State	Max Deposit	Deposit Return	Rent Increase Notice	Withhold Rent	Repair Deduct	Entry Notice	Nonpayment Termination	Tenant at will Termination	Lease Violation Termination	Abandoned Property	Landlord Index
Alaska	AK	0	0	0	0	0	0	0	0	0	1	1
Arizona	AZ	0	0	0	0	0	0	0	0	0	1	1
Hawaii	HI	0	0	0	0	0	0	0	0	0	1	1
Kansas	KS	0	0	0	0	1	0	0	0	0	0	1
Nevada	NV	0	0	0	0	0	0	0	0	1	0	1
Rhode Island	RI	0	0	0	0	0	0	0	0	0	1	1
Vermont	VT	1	0	0	0	0	0	0	0	0	0	1
California	CA	0	0	0	0	0	0	1	0	1	0	2
Delaware	DE	0	0	0	0	0	0	0	0	1	1	2
Maine	ME	0	0	0	0	0	0	0	0	1	1	2
Minnesota	MN	1	0	0	0	0	0	0	0	1	0	2
New Hampshire	NH	0	0	0	0	1	0	0	0	0	1	2
New Jersey	NJ	0	0	0	0	0	0	1	0	0	1	2
Oregon	OR	1	0	0	0	0	0	0	0	0	1	2
Pennsylvania	PA	0	0	1	0	0	0	0	1	0	0	2
South Dakota	SD	0	0	0	0	0	0	1	0	1	0	2
Iowa	IA	0	0	0	0	0	0	1	0	1	1	3
Kentucky	KY	1	0	1	0	0	0	0	0	0	1	3
Massachusetts	MA	0	0	0	0	0	1	0	0	1	1	3
Nebraska	NE	0	0	0	0	1	0	1	0	0	1	3
North Dakota	ND	0	0	0	1	0	0	1	0	1	0	3
Oklahoma	OK	1	0	1	0	0	0	0	0	0	1	3
South Carolina	SC	1	0	1	0	1	0	0	0	0	0	3
Tennessee	TN	1	0	1	0	0	1	0	0	0	0	3
Washington	WA	1	0	0	0	0	0	1	1	0	0	3
Connecticut	CT	0	0	1	0	1	0	1	1	0	0	4
Michigan	MI	0	0	1	0	0	1	0	0	1	1	4
Missouri	MO	0	0	1	0	0	1	1	0	0	1	4
New Mexico	NM	1	0	0	0	1	0	1	0	1	0	4
Virginia	VA	0	1	1	0	1	0	0	0	0	1	4
District of Columbia	DC	0	1	0	1	1	1	0	0	0	1	5
Illinois	IL	1	1	1	0	0	1	0	0	0	1	5
Indiana	IN	1	1	0	1	1	0	0	0	1	0	5
Maryland	MD	0	1	1	0	0	1	1	0	0	1	5
Texas	TX	1	0	1	1	0	0	1	0	1	0	5

Table 1: Landlord Rights by States (Continue)

State	State	Max Deposit	Deposit Return	Rent Increase Notice	Withhold Rent	Repair Deduct	Entry Notice	Nonpayment Termination	Tenant at will Termination	Lease Violation Termination	Abandoned Property	Landlord Index
Maryland	MD	0	1	1	0	0	1	1	0	0	1	5
Texas	TX	1	0	1	1	0	0	1	0	1	0	5
Wisconsin	WI	1	0	1	0	1	1	0	1	0	0	5
Montana	MT	1	0	1	0	0	0	1	1	1	1	6
New York	NY	1	1	1	0	0	1	1	0	0	1	6
North Carolina	NC	0	0	1	1	1	1	0	1	1	0	6
Ohio	OH	1	0	1	0	1	0	1	0	1	1	6
Utah	UT	1	0	1	0	0	0	1	1	1	1	6
Wyoming	WY	1	0	1	0	1	0	1	1	1	0	6
Alabama	AL	0	1	1	1	1	0	0	1	1	1	7
Arkansas	AR	1	1	1	1	1	1	0	0	0	1	7
Colorado	CO	1	0	1	0	1	1	1	0	1	1	7
Georgia	GA	1	0	0	1	1	1	1	0	1	1	7
Louisiana	LA	1	0	1	1	0	1	0	1	1	1	7
Mississippi	MS	1	1	1	1	0	1	1	0	0	1	7
Florida	FL	1	0	1	0	1	1	1	1	1	1	8
Idaho	ID	1	0	1	1	1	1	1	0	1	1	8
West Virginia	WV	1	1	1	1	1	1	1	0	1	0	8
Sum		26	10	27	12	20	18	23	11	25	32	NA

Notes: This table reports the individual scores for the ten law provisions as well as the final landlord-rights index in each state. For the ten law provisions, a score of 1 means a state favors landlords to tenants. The landlord–rights index reported in the last column is the sum of all ten provisions.

Table 3: Descriptive Statistics: Eviction

Variables	N	Mean	Std. Dev.	Min	Max
	City Level Data				
Eviction Filling Rate (%)	3196	5.91	12.35	0.00	278.65
Eviction Rate (%)	3196	2.10	2.25	0.00	24.00
Population (thousand)	3196	51.06	195.99	10.00	8426.74
Population Growth (%)	3196	3.70	9.74	-42.51	298.75
Median Household Income (thousand $)	3196	60.38	27.12	13.15	250.00
Household Income Growth (%)	3196	1.41	6.65	-33.47	34.48
Share of Renter Occupied units (%)	3196	37.23	14.75	1.57	100.00
Share of White Population (%)	3196	62.92	25.14	0.58	97.87
Median Rent as % of household income	3196	31.27	5.07	13.10	50.00
Median Gross Rent ($)	3196	1032.04	367.10	464.00	3501.00
Poverty Rate (%)	3196	11.32	7.67	0.00	54.47
Median Number of rooms in a housing unit	3195	5.66	0.89	3.10	9.00
Share of Units Built After 2010 (%)	3195	2.29	2.82	0.00	33.20
Average Winter Temperature (deg F)	3195	37.00	12.02	12.40	67.40
Rental Housing Supply per 100 Persons (units)	3195	15.21	6.66	0.76	71.98
Vacancy Rate of Rental Housing Units (%)	3195	5.79	4.39	0.00	77.90
	County Level Data				
Zillow Rent Index ($)	2,434	1,096.07	433.71	596.67	13,959.58
Zillow Rent Index ($ psf)	1,459	0.84	0.31	0.41	5.17
Asking Rent ($)	518	1,386.68	500.19	618.13	4,373.75
Asking Rent ($ psf)	519	1.04	0.76	0.51	14.92
	State Level Data				
Share of Homeless Population (%)	51	0.17	0.19	0.06	1.29
Share of Veteran Population (%)	51	8.77	1.60	5.11	12.79

Notes: This table reports the summary statistics of the eviction variables and control variables.

Table 4: Landlord-Rights Index and Rent Affordability

VARIABLES	(1) Median Rent ('000)	(2) ZRI ('000)	(3) ZRI (psf)	(4) Asking Rent ('000)	(5) Asking Rent (psf)
Landlord Rights Index	-0.018**	-0.002	-0.007	-0.017	-0.001
	(0.008)	(0.017)	(0.008)	(0.014)	(0.009)
Population (log)	0.007	-0.040***	-0.005	0.001	0.017
	(0.006)	(0.011)	(0.008)	(0.020)	(0.016)
Population Growth	0.001***	0.014***	0.015***	0.036***	0.014**
	(0.000)	(0.004)	(0.003)	(0.007)	(0.006)
Median Household Income (log)	0.631***	0.878***	0.623***	1.532***	1.145***
	(0.064)	(0.233)	(0.125)	(0.244)	(0.159)
Median Household Income Growth	-0.003***	-0.003**	-0.001	0.010***	0.012**
	(0.001)	(0.001)	(0.001)	(0.004)	(0.005)
Share of Units Built After 2010	-0.005	-0.031***	-0.035***	-0.050***	-0.046***
	(0.004)	(0.010)	(0.007)	(0.013)	(0.009)
Median Number of Rooms	-0.016	-0.231**	-0.224***	-0.322***	-0.382***
	(0.012)	(0.091)	(0.044)	(0.086)	(0.062)
Average Winter Temparature	0.009***	0.009***	0.001	0.010***	0.000
	(0.002)	(0.003)	(0.002)	(0.004)	(0.003)
Median Property Tax Amount	0.043***	0.000***	0.000**	0.000	0.000
	(0.015)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-6.204***	-6.986***	-4.609***	-13.962***	-9.578***
	(0.620)	(1.916)	(1.143)	(2.110)	(1.421)
Geography level	City	County	County	County	County
Observations	3,524	2,320	1,381	467	471
Adj–R	0.730	0.351	0.466	0.714	0.669

Notes: This table reports our estimation results of Equation 38 in Section 3. The dependent variable in Column (1) is the median gross rent at the city level. The dependent variable in Column (2)–(3) are county-level Zillow rent estimates. The dependent variable of Column (4)–(5) is landlords' Asking rent price. Clustered standard errors are shown in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 5: Landlord-Rights Index, Housing Supply, Vacancy, and Homeless Rate

VARIABLES	(1) Rental Supply (Per 100 residents)	(2) Vacancy Rate (%)	(3) Homeless Rate (%)
Landlord Rights Index	0.175	0.329**	-0.008
	(0.196)	(0.132)	(0.005)
Population (log)		-0.102	-0.004
		(0.134)	(0.018)
Population Growth	0.002	-0.021**	
	(0.015)	(0.010)	
Median Household Income (log)	-5.712***	-1.887***	
	(1.224)	(0.658)	
Median Household Income Growth	0.058***	0.023*	
	(0.014)	(0.013)	
Share of Units Built After 2010	0.099*	0.058*	
	(0.050)	(0.034)	
Median Number of Rooms	-4.243***	-0.267	
	(0.280)	(0.294)	
Median Property Tax Amount	0.541**	-0.157	
	(0.253)	(0.123)	
Median Rent As % of Income			0.026***
			(0.009)
Poverty Rate			-0.011
			(0.008)
Share of Veteran Population			0.007
			(0.013)
Average Winter Temperature	-0.063**	0.037**	0.001
	(0.027)	(0.018)	(0.003)
Constant	101.252***	26.508***	-0.482
	(12.150)	(5.422)	(0.331)
Observations	3,525	3,525	50
Adj–R	0.566	0.129	0.208

Notes: This table reports our estimation results of Equation 39 in Section 3. Clustered standard errors are shown in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Table 6: Landlord-Rights Index and Eviction

	(1) Eviction Filing Rate	(2) Eviction Filing Rate	(3) Eviction Rate	(4) Eviction Rate
Landlord Rights Index	0.398	0.523	0.234**	0.199**
	(0.400)	(0.580)	(0.094)	(0.093)
Log of Population		-1.371		0.158**
		(1.246)		(0.065)
Poverty Rate		-0.182		0.094***
		(0.289)		(0.018)
Percent of Renter-occupied Units		0.095		-0.008
		(0.092)		(0.007)
Median Rent as % of Income		-0.105		-0.027*
		(0.111)		(0.016)
Share of White Population		-0.151		-0.006
		(0.111)		(0.007)
Constant	3.971**	28.800	1.051**	0.043
	(1.964)	(21.284)	(0.463)	(1.064)
Observations	3,368	3,262	3,301	3,198
Adj–R	0.00441	0.0871	0.0456	0.140

Notes: This table reports our estimation results of Equation 40 in Section 3. Clustered standard errors are shown in parentheses (*** p<0.01, ** p<0.05, * p<0.1)