Rent Control and Housing: Evidence from New Jersey

Osman Keshawarz, University of Massachusetts Amherst[1]

Abstract

In response to rapidly rising rents in housing markets across the United States, many state and local governments have either passed, or are considering passing, some form of rent control. While existing policy and economic literature largely opposes rent control, empirical evidence on its effects remains somewhat mixed, relying largely on single-city studies of idiosyncratic housing markets. This study adds to the empirical literature on rent control by investigating the differential growth rates of median rents and the housing stock in rent-controlled and non-rent-controlled towns in New Jersey. Rather than looking at the effects in a single city, this paper looks at the entire state, including 112 cities or towns with some form of rent control.

To test the effectiveness of rent control in constraining growth in rents and its effect on the growth and availability of the housing stock, I use a two-period panel data set using American Community Survey data from the years 2008-2012 and 2013-2018. I combine this with a database of New Jersey municipal rent regulations that were scraped from municipal law databases. I use a first-differences methodology to estimate reduced form equations that relate growth in median rents to growth in the housing stock at both the county subdivision and census tract level. I also estimate these equations for a subset of tracts centered around regions of high rent growth. The results show small and non-significant effects for rent control on rent growth and large and significant effects for changes in median income on rents and the housing stock. When the sample is restricted to those tracts surrounding high rent-growth tracts, rent control has a significant and negative effect on growth in rents with a negative but insignificant effect on the housing stock.

These results suggest that the so-called "second generation" rent controls implemented in New Jersey have a much lighter impact on rents than expected; they become binding only when regions experience large shocks in rent growth. On the other hand, rent controlled jurisdictions seem to exhibit surprisingly large implied elasticities of the rental housing supply, even when rent control does not seem to be binding on rents. Finally, by far the greatest driver of rent growth is growth in income, rather than growth in the stock of housing, which itself has the effect of increasing median rents.

Introduction

Even prior to the COVID-19 pandemic and subsequent chaos in housing markets, housing affordability in the United States was approaching the point of a long-simmering crisis. Since the 1960s, stagnating renter incomes and rising rents led to a steady increase in the number of cost-burdened renter households continuing into the 2020s (Joint Center for Housing Studies, 2019).

---

[1] Last updated: November 2, 2021. The latest version of this document can be found at: http://okeshawarz.github.io/jmp_keshawarz.pdf

Pressure from constituents in highly rent-burdened areas and newly-empowered tenants' unions grew into renewed demands for housing market regulation, including the relaxation of zoning restrictions on multi-family construction and finally, rent control. For the first time in many decades, state governments themselves began to consider addressing rising rents through rent control; in 2019, the state of California passed a state-wide measure that increased the power of municipal governments to strengthen rent control laws, and the state of Oregon passed the first state-level rent control law in the nation's history (Zaveri, 2019), and rent control's re-emergence into American political consciousness was solidified by the addition of a national rent control provision to 2020 Democratic primary candidate Bernie Sanders' housing policy platform.

Despite this renewed public and legislative interest in rent regulation, economic and policy literature maintains a relatively firm consensus view of the negative effects of rent control. It is presented as a quite literally textbook (Mankiw, 2011) example of a price ceiling that will result in excess demand for housing and declines in both quantity and quality of the rental housing stock. Despite this firm theoretical opposition, empirical investigations into existing rent control laws in the United states have been comparatively muted; many of them rely single-city case studies surrounding a single change in a city law to establish identification (Autor et al., 2014; Diamond et al., 2018), leaving open questions of generalizability and external validity. They also limit themselves largely to the cities of New York and San Francisco which have the benefits of long-standing and easily accessible data on rents and housing markets, and the drawback of an idiosyncratic and historically-specific housing market environment—as Arnott (1998) notes, the intense focus of the literature on the New York City experience tended to suck all of the oxygen out of the debate over rent control's applicability and effect in other areas.

This essay focuses on rent control in New Jersey cities and towns. An insurgent tenants' movement in the 1960s and 1970s resulted in the establishment of relatively widespread rent regulations in many of the state's cities and towns, most of which are still in force to this day. Rent control in New Jersey offers an attractive quasi-experimental environment for several reasons: first, all rent controlled towns in the state are of the second-generation, or "rent-stabilization" type. That is, rather than legislating a hard cap on rents, they implement an allowable yearly increase that is usually linked to the CPI. Second, municipal rent controls in the state were all passed in a short period of about five years and then remained relatively untouched by state or local legislative action for the next 50 years. Finally, using the geographic dispersal of rent controlled towns and tracts between those without rent control, it is possible to use political boundaries between controlled and non-controlled jurisdictions as a source of exogenous variation to potentially identify factors driving the differential impacts of rent control.

In this essay, I have two major questions: 1) is rent control an effective policy in the maintenance of housing affordability? And 2) to what extent does rent control impact the stock of housing and rental housing? To look at these questions, I construct a database of rent control laws scraped from the municipal codes of the 112 towns that had some form of rent regulation policy as of 2020. I combine this with American Community Survey (ACS) data on rent, rooms, and the housing stock to form a two-period panel data set covering 2008-2018. I then use a first-differences (FD) estimation strategy to examine the effects of the existence of rent controls on growth in median rents and the stock of housing. To account for the possibility of substantial within-town geographic heterogeneity, I also estimate these equations at the census tract level, and additionally a subset of census tracts in regions experiencing high rent growth.

My results show that the second-generation rent controls in New Jersey often do not appear to be binding; the full-sample results show slight negative effects on both growth median gross rents and growth in the stock of rental housing, but neither of these effects are statistically significant. However, when limited to geographic regions that are experiencing high growth in median rents, rent control *does* have a significant and negative effect on rents while effects of the housing stock remain insignificant. This suggests that the second-generation rent controls that exist in New Jersey *do* become binding when a geographic location experiences large-enough shocks to rent, while the effect on the supply of housing is much more muted. These results also show that by far the most significant driver of growth in rents is *median household income*, rather than growth in the housing stock, and when rent control is binding, the effect of income growth on rents is no longer significant. However, these results also show that, while the coefficient estimates are insignificant, they imply relatively high elasticities of supply for rental housing—the existence of rent control in a jurisdiction potentially impacts growth in the rental housing stock a great deal, even when rent controls might not be binding.

This essay makes 3 novel contributions: first, it is one of the few modern studies that examines housing market data after the Great Recession; most recent analyses use data from the 1990s and early 2000s (Been et al., 2019). Second, I attempt to exploit geographic variation in political differences to model the differential impacts of housing market shocks to housing demand on rent controlled and non-controlled towns. Finally, this paper is one of the few that incorporates a multi-city approach.

A Brief Review of the Literature

Rent control is generally considered a solved problem in the economics and policy literature; most reviews of the subject begin with the well-known Lindbeck (1977) quip, on the Swedish experience: "In many cases rent control appears to be the most efficient technique presently known to destroy a city– except for bombing." In a famously-cited survey, Alston and co-authors (1992) found that 76% of the surveyed academic and professional economists "generally agreed" with the statement "[a] ceiling on rents reduces the quantity and quality of housing available." This was the highest degree of consensus out of the 40 statements on the survey. This consensus view is summed up by Krugman (2000) writing for the New York Times:

> *Not that I have any special knowledge about San Francisco's housing market– in fact, I didn't know a thing about it. But it was immediately obvious from the story what was going on. To an economist, or for that matter a freshman who has taken Economics 101, everything about that story fairly screamed those two words– which are, of course, 'rent control.'*

Arnott (1995) provides a useful review of the history and history of economic thought on Rent control in the United States. What he calls "first-generation" rent controls were those passed during World War II, in order to accommodate the rapid expansion of the urban industrial working class as the country shifted to wartime production, although housing shortages had begun to appear even earlier in major industrial cities (Willis, 1950). These first-generation programs "entail[ed] rent freezes, with intermittent upward adjustments in rents" (Arnott, 1998). This variety of rent regulation, which amounts to a freeze in nominal rents, are the closest to the "textbook" example of price controls in housing markets. By the 1950s, first-generation controls were no longer in effect anywhere in the United States, except for New York City; however much of the common wisdom regarding rent controls comes precisely from the experiences of American and Western European cities with wartime regulations.

Hayek (1975) and Friedman and Stigler (1946) outline the primary theoretical criticisms of these first generation rent controls. Namely,

> *Rent ceilings, therefore, cause haphazard and arbitrary allocation of space, inefficient use of space, retardation of new construction and indefinite continuance of rent ceilings, or subsidization of new construction and a future depression in residential building. Formal rationing by public authority would probably make matters worse.*

Gyourko and Linneman (1989), Olsen (1972), and DeSalvo (1971) all examine the effects of first-generation rent controls in New York City, using the 1968 NYC Housing and Vacancy Survey, coming to similar conclusions: the first-generation controls were associated with lower housing quality and higher rents in the uncontrolled sector, as well as lower tenant mobility, and that much of the inefficiencies arising from rent control is a result of the haphazard targeting of the program (i.e., to structures, rather than individuals or families).

Second-generation rent controls, or "rent stabilization" policies, arose as a response to inflation in the 1970s. These types of rent regulation differ from the first-generation in that they "commonly permit automatic percentage rent increases related to the rate of inflation" (Arnott 1995, 102), as well as capital cost and property tax pass-throughs, hardship allowances, and various forms of vacancy decontrol that specify at what point a particular housing unit's rent may be adjusted to the market rate. Any rent controls that currently exist in the United States (and New Jersey in particular) are of the second-generation variety.

Much of the literature on second-generation controls focuses on the misallocation of housing that may arise from the application of controls. In effect, the reduced tenant mobility results in the eventual mismatch of preferences and housing services (Arnott & Igarashi, 2000; E. L. Glaeser & Luttmer, 1997). Rapaport (1992), in another analysis of New York City rent controls, finds that the laws "reduce the inflow into vacancy," causing tenants to stay longer than they would otherwise. It is not clear to me, however, that the reduction in tenant mobility is inherently undesirable in designing an affordable housing policy. The stated aims of many rent stabilization programs is to reduce tenant turnover and increase access of lower-income residents to public goods (Been et al., 2019).

One of the major questions of this essay is the effectiveness of rent controls on reducing rent. In other words, are second-generation controls binding, or are the loopholes (in the form of vacancy decontrol, pass-throughs, and so on) simply too wide? As it turns out, neither the theoretical nor the empirical literature has come to a consensus on this yet. Nagy (1997) and Basu and Emerson (2000) both propose that the existence of decontrols (including hardship exemptions and so on) may either increase or leave unchanged the level of rent for controlled units as opposed to the uncontrolled counterfactual. On the other hand, Arnott and Igarishi (2000) and Hubert (1993) show that it is possible under a second-generation regime for rent controls to reduce rents in both controlled and uncontrolled sectors. In (yet again) an empirical study of New York City's rent controls, Early (2000) finds that rents in the controlled sector are reduced at the cost of increasing rents in the uncontrolled sector, while Linneman (1987), also writing about New York City, found that the only significant reduction in rents occurred in the first-generation rent controlled units. He also found little evidence of housing misallocation and discrimination effects proposed by Glaeser and Gyourko (2002).

Recent studies have taken advantage of higher-quality data to provide some insight into the question of rent control. Gilderbloom and Ye (2007) estimate the impact of second generation rent controls on the same subset of New Jersey cities that this essay focuses on. The use data from a survey of towns by the New Jersey Tenants Organization and tested using cross-sectional OLS regression. They found that "moderate rent control had no impact on median monthly contract rent." They also found evidence that rent controls *increased* the supply of rental housing by incentivizing landlords to subdivide their rental units. Overall, the authors found no significant effect of rent control on the supply and maintenance of the housing stock.

Ambrosius and co-authors (2015) repeats the procedure of Gilderbloom and Ye using an additional 10 years of census data. They find, as before, that the impact of rent controls in New Jersey had negligible effects on the housing supply and suggest that the relatively generous provisions of the laws combined with widespread vacancy decontrol meant that rent controls were rarely binding. These two analyses have the benefit of being relatively more general than single-city case studies. Taken together, both these studies take two points in time and show that there has been little statistical divergence in the outcome variables. Whether that is due to the non-bindingness of rent controls or to some other confounding factor is not clear.

Diamond, McQuade, and Qian (2018) provide the most recent well-identified analysis of rent control. They use private data sets from DataQuick and Infutor. These combined datasets allowed the authors to link the identity of any resident of San Francisco to a specific address during the period 1990-2016, to both distinguish between owner-occupied and rental housing, determine tenure lengths for individual persons, and obtain structure-level data on construction year and other housing characteristics. They combine this with zip code-level estimates on rents, imputed from housing-price transaction data. In essence, they estimate a linear relationship between median rents in a zip code and the sale price of housing in that zip code. They then use this combined dataset to estimate tenant, landlord, and parcel-level effects of a ballot initiative that suddenly brought a significant number of multi-family dwellings under the rent control law. They also estimate welfare effects in a general equilibrium framework using a structural Spatial Equilibrium Model.

My most major critique of Diamond et. al is the potentially serious problems the paper has with external validity. It is based on a single case study centered around a single housing type in a single city. Moreover, the Costa-Hawkins Rental Housing Act was passed by California ballot initiative in 1995, one year after the authors' treatment went into effect. The Act established two things that radically undermined California rent control and almost assuredly affected causal identification in their model; 1) the Act allowed for vacancy decontrol, which provides strong incentives for landlords to evict tenants when the gap between market-rate and controlled rents becomes sufficiently large, and 2) the Act exempted condominiums and new construction from rent control. The authors' findings were precisely that rent control led to higher eviction rates of lower-income tenants, and that landlords converted some of their stock of rental housing to condominiums in response to rent control. This, in my view, is sufficient cause to question the causal claims based on their model, since it is impossible to determine whether the outcomes were a result of the state-level weakening of rent control (via Costa-Hawkins) or the local-level strengthening of rent control.

Sims (2007) and Autor, Palmer, and Pathak (2014) both study the effects of the end of rent control in Massachusetts, as part of the wave of state-level anti rent control legislation that swept through much of the country during the 1990s. They look at the effect of the passage of Question 9 by Massachusetts ballot referendum in 1994, which banned any rent control in Massachusetts cities. At the time of the law's enactment, only the cities of Boston, Cambridge, and Brookline still had rent control laws on the books. After the passage of Question 9, almost all housing units in the three cities became decontrolled on January 1, 1995.

Sims uses public data from the American Housing Survey to estimate the impact of the removal of rent control on several housing characteristics, including the quality of rental housing, the level of rent and housing costs, and the length of renter tenure. He uses a DID identification strategy to compare Census zones in the Boston MSA that experienced decontrol to those that never experienced rent control, using a model with zone and year fixed effects and controlling for housing unit characteristics.

To test spillover effects of rent decontrol, Sims uses an instrumental variable strategy that takes a value of 1 if the unit was in a zone that was ever under rent control and zero otherwise. To test indirect spillover effects, the author constructs several instruments including the interaction of a 2-family house indicator (which was excluded from rent control), pre-treatment year indicator, and a controlled-zone indicator. In other words, finding the effect of decontrol on 2-family homes in controlled zones should provide for the identification of spillover effects, since these units were never under rent control. The author similarly constructs IVs for other forms of never-controlled housing.

Sims finds that the end of rent control had little effect on the construction of new housing. He further found evidence that rent control decreases the number of available rental units through condo conversions. In other words, rent control seemed to affect the quantity of rental housing, but not the quantity of the housing stock. He also finds insignificant negative effects on indicators of physical unit condition, but unsurprisingly, significant increases in rent charged after decontrol. Finally, he finds that rent controlled units had much longer tenure times, supporting the idea of rent control promoting neighborhood stability.

Autor et. al also examine the effects of the passage of Question 9 in Massachusetts in the context of spillover effects. The authors were less interested specifically in quantifying the impact of rent (de)control, but instead exploited exogenous change in regulations to see how residential externalities get capitalized into housing prices as price regulations are relaxed. Their identification strategy relies on the fact that both controlled and never-controlled apartments stood "side-by-side in Cambridge neighborhoods on the eve of rent control removal thus offering a tight temporal and geographic framework for assessing the impact of the law on residential prices." In other words, since the features of rent-controlled apartments (non-owner-occupied houses, condominiums, or apartments built prior to 1969) were distributed essentially randomly throughout the Cambridge housing stock, the effects of purely the exogenous variation in control status can be identified neatly.

The authors identified two major channels through which rent decontrol may have affected the market value of residential properties. The authors term the first the "direct effect," reflecting the ability of landlords to now charge market-rate rents; this both increases the maximum rent that the landlord may charge and the net present value of the property. The second channel they identify is the indirect effect, where decontrol raises the value of surrounding, never-controlled properties. The mechanism that the authors propose is that decontrol incentivizes landlords to "renovate and modernize decontrolled units, raising their rental values." This attracts higher-income tenants to the formerly-controlled units, who attract other high-income tenants to the never-controlled properties, by means of "improved housing stock and more affluent neighbors." Read critically, this seems a bit difficult to parse; it is difficult to imagine that higher-income tenants will be drawn to never-controlled units due to better amenities in the formerly-controlled house next door. The more plausible claim is that higher-income tenants will be drawn to never-controlled units by "better" neighbors in formerly-controlled ones.

Rent Control in New Jersey

The push for second-generation rent controls in New Jersey emerged because of a boom in population growth in the state in the 1960s. For the period 1960-1970, New Jersey's population grew 18.2%, compared to national growth of 13.2% (Baar, 1977). This surge in population consisted primarily of middle-class families, leading to a shortage of both affordable (for moderate-income families) rental housing and single-family homes for purchase. The general shortage of housing in Northeastern industrial areas, combined with stringent zoning restrictions in New Jersey cities led to rapidly increasing rents as compared to the Northeast region and the rest of the country.

Increased conflict between landlords and renters as a result of the shortage of housing and demands for rent increases that were substantially higher than the level of inflation led to a series of strikes and demonstrations, which in some cases turned violent. This led to the eventual formation of the New Jersey Tenants Organization (NJTO) in 1970, which took over the organization of demonstrations and rent strikes at local levels, while pushing for the adoption of rent controls at the state level. While several bills were drafted in the early '70s, none were ever passed by the state legislature due to political pressure from landlords and the then-undecided question of the constitutionality of statewide rent regulations. In the meantime, the NJTO led the tenants movement to several significant victories at the local level—in February of 1970, a rent strike in Jersey City ended with lifetime leases for existing tenants and rent increases that were tied to cost-of-living, pointing to the future shape of municipal rent control laws. At the end of 1970, the NJTO had "organized 43 strikes involving 20,000 tenants" (Baar, 1977). The majority of these strikes were successful in obtaining rent concessions from landlords.

By 1972, the push for rent control at the state level had faltered, and the NJTO began focusing exclusively on the passage of local rent control ordinances, and by the end of that year, seven cities had adopted local rent controls. Fort Lee's rent ordinance was subsequently challenged and upheld by the New Jersey Supreme Court and eventually the United States Supreme Court, opening the doors for widespread adoption of municipal rent laws. The Fort Lee ordinance formed the model legislation for which the majority of other towns adopted as their own regulations (Baar, 1977). In particular, the Fort Lee law provided several provisions that were replicated in other New Jersey laws: a minimum unit size for coverage (in the case of Fort Lee, buildings with two or fewer units were exempt), property tax and capital improvement pass-throughs, hardship increases, annual rent increases tied to CPI, and an unpaid five-member rent control board (Borough of Fort Lee, 1978). One outcome of the Fort Lee law with important implications for this essay is the fact that capital or tax surcharges and hardship increases are incorporated into the base rent figure for the determination of the maximum allowable increase the following year (Baar, 1977). Despite continual legal challenges, by 1974, 120 municipalities had passed rent control ordinances, with 112 of them surviving to the year 2020. These jurisdictions are mapped in *Figure 1* and are listed in *Appendix A*.

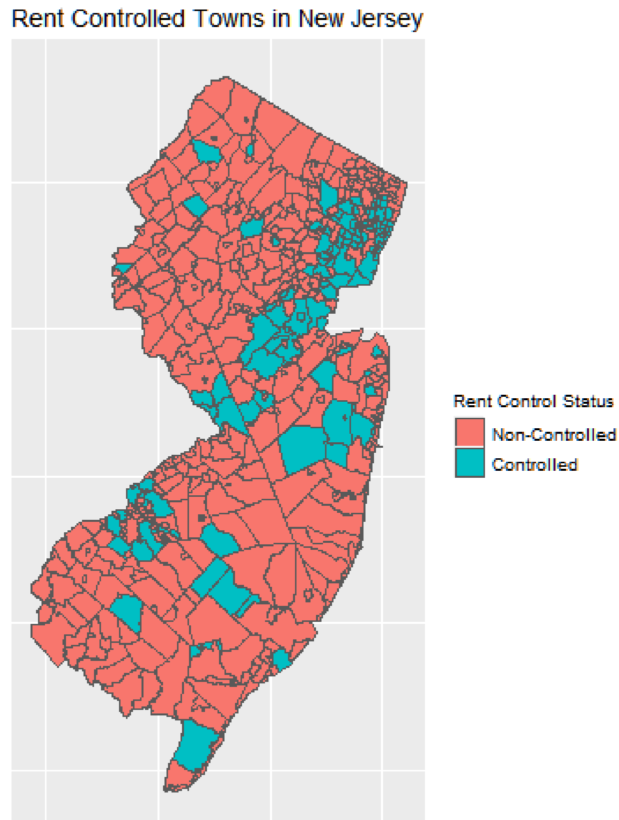

Figure 1: Rent-controlled towns in New Jersey.

Data

Town Rent Control Laws

A key element to this research is the database containing details of each town's rent control ordinance. (J. Gilderbloom, 1981) used an NJTO survey of each town to get this data and relied on it in their subsequent study. Now, town ordinances are posted online in easily-scrapable formats which allowed me to obtain not just the presence or absence of rent control, but also the allowable rent increase, the presence of vacancy decontrol, and several other relevant town-level indicators. This resulted in a database of 112 towns enacting some form of rent control as of February 2020.

American Community Survey

The second major source of data for this research is the American Community Survey 5-year estimates. This survey implemented by the Census Bureau asks households several questions regarding demographic, economic, and housing characteristics. For this study, the variables of interest from the ACS are: median household income, median gross rent, tenure type (owned vs. rented), tenure length (proxied via move-in-date), rooms per household, number of housing units per household (household size), and total population. The 5-year ACS provides estimates down to the census tract and county subdivision level. Since for New Jersey, county subdivisions are exactly congruous with municipal boundaries, I used these as the basis for the town-level analysis. This resulted in a two-period, town-level panel-data set comprising the years 2009-2013 and 2014-2018. I also construct this dataset at the census-tract level, where a tract is assigned to have rent control if most of the tract lies within a rent-controlled town or city. Finally, the ACS topcodes median rents for small geographies where the value exceeds $2,000 in the 2013 dataset. Since this will generate incorrect values for rent growth calculations, I exclude geographies that are topcoded in 2013. This results in the elimination of about 10% of observations in both the town- and tract- level data.

Methodology

This essay attempts to answer the following question: What, if any, are the effects of rent control on growth in rents and growth in the housing stock? A novel contribution of this analysis is the use of a 2-period panel to examine the effects of the independent variables on the *growth* of the dependent variables. The empirical strategy for the evaluation of treatment effects in panel data is the Difference-in-Difference (DD) method. However, since the treatment effect for all the rent-controlled towns was implemented for before the existence of the existence of the housing market data, this method is unsuitable for the task. Instead, I opt to look at the effects of *growth rates* of the variables of interest in rent controlled and non-rent-controlled towns. Because the variable of interest here is a time-invariant dummy (i.e., a town either has rent control or it does not), the Within estimator used in standard fixed-effects models is unsuitable for this analysis. Since this is a 2-period panel, I use a first-differences approach which is equivalent to the fixed-effects estimator for $t = 2$. I begin with the following model:

$$y_{it} = \beta_0 + \beta_1(t * R_i) + \beta_2 X_{it} + \beta_3(t * L_i) + v_i + \epsilon_{it}, \tag{1}$$

Where y is a vector of dependent variables, i and t are town (or tract) and year indices, X is a vector of control variables, and R is the indicator for whether the town has rent control. L is a categorical variable representing time-invariant dummy variables (for example, Metropolitan Statistical Areas). v_i represents town-level fixed effects. After taking first differences of both sides of *Equation 1*, it becomes:

$$\Delta y_i = \beta_1 R_i + \Delta\beta_2 X_i + \beta_3 L_i + \Delta\epsilon_i. \tag{2}$$

The coefficients can then be estimated via OLS. Because the initial data is at the county subdivision (i.e., town) level of geography, it may be masking substantial geographic heterogeneity in housing market variables. Therefore, I estimate the FD equations using both town and tract-level data, where each tract is assigned to rent controlled status based on its location in a rent-controlled town.

Arnott (1995) notes that one problem with empirical studies of rent control is the high noise-to-signal ratio. Ambrosius et. al and Gilderbloom et. al attempt to get around this by indexing the relative strength of rent controls in each town. Instead, I use a spatial approach. In accordance with Waldo Tobler's First Law of Geography ("everything is related to everything else, but near things are more related than distant things"), I assume that geographically proximal housing markets exhibit similar characteristics—namely, similar levels of housing demand and labor market conditions. I don't have a true counterfactual for the question "what would rent growth be like if this uncontrolled town were to have rent control?" However, using the exogenous variation of town borders that cut across housing markets would allow me to construct a good-enough approximation.

To test the validity of this assumption, I use the Moran's I statistic to test the degree of spatial autocorrelation of the growth in housing market variables, particularly for rent. The details and results of this procedure are in *Appendix B*. I find that the tract level data has an *I* statistic of 0.08, indicating a small amount of spatial correlation in rent growth (namely, 8% of the variation of a census tract's rent growth is explained by the variation in that tract's *k*-neighborhood, where *k*=5). While small, the effect is highly significant. Because rent growth does experience this form of spatial clustering, the final part of my analysis is the restriction of the set of census tracts to those controlled and non-controlled towns that surround non-controlled towns experiencing high rent growth. For `this essay, I consider those towns in the top quartile of rent growth over the two ACS periods to be "high growth." Specifically, a census tract is included in this sample if: a tract is *not* controlled and in the top quartile of rent growth in uncontrolled tracts *and* borders at least one rent-controlled tract, *or* the tract is controlled or uncontrolled and borders one of the top-quartile tracts. New Jersey census tracts, along with the subset of high-growth neighborhoods, are mapped in *Figure 2*.

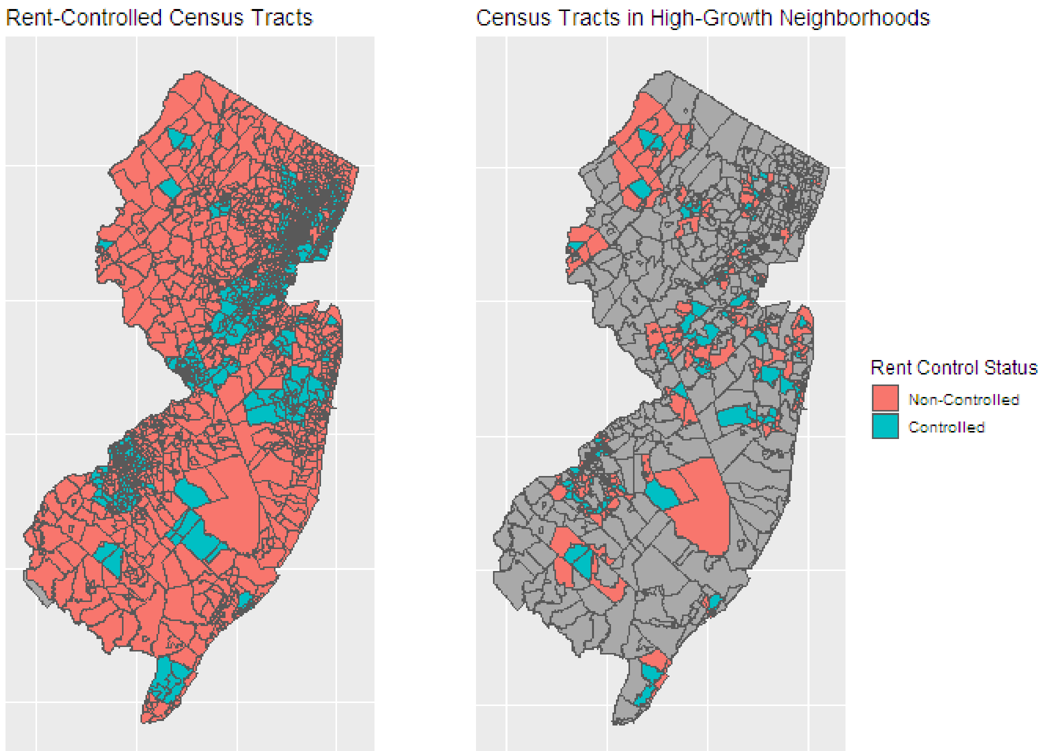

Figure 2: Rent-controlled Census tracts in New Jersey (left) and rent-controlled and non-rent-controlled tracts in neighborhoods surrounding census tracts in the top quartile of rent growth for the state.

Descriptive Statistics

Town-level Descriptive Statistics

There are 565 cities and towns in the State of New Jersey. Of these, 112 municipalities have enacted some form of rent control, as of January 2021.

Table 1 presents summary statistics for rent controlled vs. non-rent-controlled towns. Most of the rent-controlled towns are concentrated in the densely populated New York City and Philadelphia metro areas, meaning that roughly half the population of the state live in a rent-regulated city or town. We can see that rent-controlled towns tend to be more heavily urbanized, with high population densities and much larger numbers of renter households.

	All Towns	**Rent Controlled**	**Non-Rent Controlled**
Number of Towns	565	112	453
Total Population	8,881,845	4,219,020	4,662,825
Total Housing Units	3,605,401	1,632,858	1,972,543
Fraction Renter Occupied	0.36	0.49	0.25
Average Median Income	$93,279	$81,287	$96,264
Average Median Gross Rent	$1,430	$1,377	$1,443
Average Median Value	$389,948	$355,514	$403,496
Average Median Number of Rooms	6.4	5.59	6.6
Percent Change in Median Gross Rent	3.40%	3.25%	3.58%
Percent Change in Housing Stock	0.79%	0.58%	0.84%

Table 1: Selected statistics for rent controlled and non-rent-controlled towns in New Jersey, from 2014-2018 ACS. Monetary figures are in 2018 constant dollars.

	All Towns	**Rent Controlled**	**Non-Rent Controlled**
0-10,000	324	17	307
10,001 to 50,000	205	65	140
50,001 to 100,000	29	23	6
100,001 and above	7	7	0

Table 2: Population size distributions for rent controlled and non-rent-controlled municipalities.

Tract-Level Descriptive Statistics

Because census tracts are statistical entities that target an optimal population size of 4,000 people, the number of rent-controlled tracts is roughly equal to the number of non-rent-controlled tracts. The rent-controlled census tracts are, again, concentrated in the Philadelphia and New York City metro areas, and tend to be much smaller in geographic extent than the non-rent-controlled tracts.

	All Tracts	**Rent Controlled**	**Non-Rent Controlled**
Number of Tracts	1,801	877	924
Total Population	8,034,822	3,962,021	4,072,801
Total Housing Units	3,289,195	1,531,526	1,757,669
Fraction Renter Occupied	0.38	0.51	0.27
Average Median Income	$84,873	$68,110	$90,095
Average Median Gross Rent	$1,360	$1,310	$1,408
Average Median Value	$345,231	$300,922	$351,667
Average Median Number of Rooms	5.90	5.26	6.48
Percent Change in Median Gross Rent	3.05%	4.38%	5.60%
Percent Change in Housing Stock	1.19%	0.83%	1.51%

Table 3: Selected statistics for rent-controlled and non-rent-controlled census tracts in New Jersey, from 2014-2018 ACS. Monetary figures are in 2018 constant dollars.

Top-Quartile Neighborhood Descriptive Statistics

The purpose of this subset is to examine the differential impacts of rent control on geographic neighborhoods that exhibit high rent growth. The selection procedure for this subset, called the "top-quartile neighborhood," is outlined in the *Methodology* section above, and results in a sample consisting of 323 tracts, of which 117 are rent-controlled and 206 are non-controlled. The controlled tracts in this sample have significantly fewer renter households as a fraction of all households, and (reasonably) have higher rent growths in non-controlled tracts. Curiously, rent-controlled tracts have lower average rent growth than the full sample.

	All Tracts	Rent Controlled	Non-Rent Controlled
Number of Tracts	323	117	206
Total Population	1,566,437	604,341	962,096
Total Housing Units	638,034	234,425	403,609
Fraction Renter Occupied	0.28	0.33	0.26
Average Median Income	$90,100	$81,737	$94,850
Average Median Gross Rent	$1,423	$1,371	$1,452
Average Median Value	$341,494	$304,130	$362,352
Average Median Number of Rooms	4.53	4.37	4.62
Percent Change in Median Gross Rent	7.75%	3.10%	10.40%
Percent Change in Housing Stock	1.12%	0.22%	1.63%

Table 4: Selected statistics for rent-controlled and non-rent-controlled census tracts in top-quartile-neighborhoods. Monetary figures are in 2018 constant dollars.

Estimation and Results

Town-level Estimates of Rent Control on Rents and the Housing Stock

In this section, I focus on the primary questions asked in the *Introduction*: Is rent control an effective policy for moderating the growth of residential rents? Does it have any effect on the availability of rental housing?

I estimate the following reduced-form equations:

$$\begin{aligned}\Delta\, log\, median\, gross\, rent \\ = \beta_0 + \beta_1 has\ controls + \beta_2\, \Delta\, log\, median\, household\, income\end{aligned} \tag{3}$$

$$\begin{aligned}\Delta\, log\, rental\, housing\, stock \\ = \beta_0 + \beta_1 has\ controls + \beta_2\, \Delta\, log\, median\, household\, income\end{aligned} \tag{4}$$

$$\begin{aligned}\Delta\, log\, total\, housing\, stock \\ = \beta_0 + \beta_1 has\ controls + \beta_2\, \Delta\, log\, median\, household\, income\end{aligned} \tag{5}$$

The major independent variable of interest is *has controls*, which is a binary variable that indicates whether the town has implemented rent control or not. *Equation 3* estimates the effect of rent control on median gross rents; Ambrosius et al. (2015) and Gilderbloom and Ye (2007), working with nearly the same set of towns, found that the ability of rent controls to actually reduce rents to be insignificant. The other major variable of interest is *median household income*. I view the relationship between income, the housing supply, and rents to be of particular importance here; economic theory predicts a strong relationship between the quantity of the housing stock and the level of rent (or, for the purposes of this essay, the *growth* in both housing and rents).

	Dependent variable:		
	Δ Log Median Gross Rent	Δ Log Rental Housing	Δ Log Total Housing
	(3)	(4)	(5)
Has Controls	0.002	-0.064	1.300^{***}
	(0.017)	(0.071)	(0.110)
Δ Log Median Income	0.200^{***}	0.190	1.200^{***}
	(0.054)	(0.230)	(0.350)
Constant	0.017^{**}	0.130^{***}	7.900^{***}
	(0.008)	(0.033)	(0.051)
Observations	525	531	531
R^2	0.026	0.003	0.220
Adjusted R^2	0.023	-0.001	0.220

Table 4: First-differences regression results for equations 3-6, the effects of growth in income and growth in housing on growth in rents, growth in rental housing, and growth in total housing. Rent control exhibits a slightly positive effect on median gross rents, but this effect is smaller than the standard error and is insignificant. Rent control and income growth have significant and positive effects on growth in the total stock of housing.

Equations 1 through *3* are estimated and the results displayed in *Table 4*. Rent control has a slight positive effect on median gross rents, but this effect is insignificant. The strongest driver of growth in both median rents and the housing stock is growth in median income. *Equation 4* shows no significant effect at the town level of either rent control or income in the growth of rental housing. Growth in the stock of total housing is, however significantly impacted by the presence of rent control, with a *positive* coefficient and a large effect size. If we ignore the non-significance of the coefficient estimates, then the results imply an elasticity of supply for rental housing growth of -32 and 650 for total housing growth.

In addition, I am also interested in subsidiary effects of rent control on the housing characteristics of New Jersey towns. *Equation 6* estimates the result of rent controls and household income on median gross rents *per room*, to account for the effect of changes in housing unit size. *Equation 7* estimates the impacts of rent control on the median number of rooms. This is to test an important finding of Ambrosius et. al (1981), which is that landlords respond to rent control by reducing the size of housing units, resulting in the *increase* in the stock of housing suggested by the results for *Equation 4*. Finally, *Equation 8* estimates the effects of rent controls on the vacancy rate. Results are displayed on *Table 5.*

$$\begin{aligned}\Delta\, log\, median\, gross\, rent\, per\, room \\ = \beta_0 + \beta_1 has\, controls + \beta_2\, \Delta\, log\, median\, household\, income\end{aligned} \tag{6}$$

$$\begin{aligned}\Delta\, log\, median\, number\, of\, rooms \\ = \beta_0 + \beta_1 has\, controls + \beta_2\, \Delta\, log\, median\, household\, income\end{aligned} \tag{7}$$

$$\Delta\, vacancy\, rate = \beta_0 + \beta_1 has\, controls + \beta_2\, \Delta\, log\, median\, household\, income \tag{8}$$

	Dependent variable:		
	Δ Log Median Gross Rent Per Room	Δ Log Median Number of Rooms	Δ Vacancy Rate
	(6)	(7)	(8)
Has Controls	-0.013	0.015	-0.029
	(0.018)	(0.016)	(0.023)
Δ Log Median Income	0.134**	0.057	-0.009
	(0.060)	(0.053)	(0.081)
Constant	0.004	0.013	-0.045***
	(0.009)	(0.008)	(0.011)
Observations	525	528	525
R^2	0.010	0.004	0.003
Adjusted R^2	0.007	0.0002	-0.001

Table 5: Secondary regression results for town housing characteristics. The effect size of rent control on median rents is larger than in Equation 3 when the dependent variable is median gross rent per room but is still not significant, though now it has the expected sign. The only significant driver of growth in median rents per room is growth in median income. There is an insignificant but negative effect of rent control on the vacancy rate.

Equation 6 finds that rent controls do constrain median gross rent per room, with the sign in the expected direction, though again, this effect is not significant. Income growth is once again a significant driver of median gross rents. *Equation 7* shows that rent controlled towns tend to have increasing rental housing unit size—this is the opposite of the effect found in previous studies of New Jersey rent control, though this effect is, again, not significant. This represents an implied elasticity of rent control on growth in housing *size* of -1.15. Finally, *Equation 8* shows the results of rent control on the vacancy rate. Rent controlled towns have slower growth in the vacancy rate, though this effect is also not significant.

Tract-level Estimates of Rent Control on Rents and the Housing Stock

Moran's I at the tract level indicates statistically significant spatial autocorrelation, while at the town level it is not significant (see *Appendix B*). The town-level aggregation likely therefore obscures significant within-town heterogeneity. To account for this, I re-estimate equations 3-8 using tract-level data, using standard errors clustered by town. These results are presented in *Table 6*.

	Dependent variable:		
	Δ Log Median Gross Rent	Δ Log Rental Housing	Δ Log Total Housing
	(3)	(4)	(5)
Has Controls	-0.005	-0.140^{***}	-0.008^{***}
	(0.009)	(0.052)	(0.003)
Δ Log Median Income	0.130^{***}	0.400^{***}	-0.013
	(0.024)	(0.120)	(0.010)
Constant	0.029^{***}	0.160^{***}	0.014^{***}
	(0.007)	(0.037)	(0.002)
Observations	1,760	1,786	1,786
R^2	0.100	0.007	0.009
Adjusted R^2	0.100	0.006	0.007

Table 6: First-differences results for equations 3-5, using tract-level data. Rent controlled tracts also experience slower growth in the stock of both rental and total housing, and the effect of rent control on the rental housing stock is now significant.

The tract-level data generally follow the town-level estimates in sign, effect size, and significance. At the tract level, rent controls do have a significant effect on the growth in both rental housing and total housing, though not on rents themselves. Ignoring the non-significance of rent control, this would lead to an implied elasticity of supply for rental housing of 28, and 1.6 for total housing. At the tract level, then, we do see evidence that the growth of the stock of rental housing is constrained, while this effect on the total housing stock is significant but smaller in effect. The results for the secondary regressions (*Equations 6-8)* are presented in *Table 7*. Here, we see that rent controls adjusted for the number of rooms per unit are now binding; growth in median rents *per room* are 2.8% lower in rent-controlled tracts. Rent controls have a *positive* effect on the growth in median number of rooms, though this effect is not significant.

	Dependent variable:		
	Δ Log Median Gross Rent Per Room	Δ Log Median Number of Rooms	Δ Vacancy Rate
	(6)	(7)	(8)
Has Controls	-0.028***	0.023	-0.015***
	(0.009)	(0.052)	(0.003)
Δ Log Median Income	0.105***	0.026	0.032***
	(0.024)	(0.120)	(0.010)
Constant	0.017**	0.013	-0.056***
	(0.007)	(0.037)	(0.002)
Observations	1,760	1,786	1,722
R^2	0.012	0.008	0.001
Adjusted R^2	0.011	0.006	-0.0003

Table 7: First-differences results for equations 6-8 using tract-level data. When accounting for the number of rooms per housing unit, the effects of rent control on rents is now significant. The effect of controls on growth in the median number of rooms is not significant, although in the opposite direction predicted by Gilderbloom et. al. Change in the vacancy rate is negative and significant.

The interpretation of *Equation 6* is not as straightforward. Rent is typically charged per housing unit and not per room, and so rent control cannot be a straightforward restriction on the growth rate of rent per room. Rent control may impact growth in rent per room by incentivizing landlord behavior—that is, landlords subdivide their units, increasing the quantity of rental housing and reducing the average size (in number of rooms) per unit. However, the growth of the rental housing stock is smaller in rent-controlled tracts (from *Table 6*). Finally, rent-controlled tracts show slower growth in the vacancy rate.

The Effects of Rent Control in Regions Experiencing High Rent Growth

Finally, I want to examine the effects of rent control in regions where they are most likely to be binding; that is, in tracts surrounding non-controlled tracts that are experience rent growth in the top quartile. This spatial subsetting procedure to develop a sample of top quartile neighborhoods is detailed in the *Methodology* section above. I estimate the same set of equations with this subset of the data, and the results are presented in *Tables 8* and *9*.

	Dependent variable:		
	Δ Log Median Gross Rent	Δ Log Rental Housing	Δ Log Total Housing
	(3)	(4)	(5)
Has Controls	-0.057**	0.016	-0.012*
	(0.022)	(0.141)	(0.007)
Δ Log Median Income	0.097	0.659*	0.009
	(0.063)	(0.369)	(0.032)
Constant	0.073***	0.084	0.013**
	(0.015)	(0.070)	(0.005)
Observations	317	319	319
R^2	0.110	0.016	0.027
Adjusted R^2	0.100	0.007	0.018

Table 8: First-differences estimates for the Top-Quartile Neighborhood subset. In this subset, rent controls are binding and have a significant effect on rents. The effect on rental housing is now positive, but this effect is no longer significant, while the effect on the total stock of housing is significant in the expected direction. Income is no longer a significant driver of rents in the constrained sample, although it does have a significant and positive effect on the growth in the rental housing stock.

In the top-quartile neighborhood sample, the effect of rent control on rents is significant and negative, though because of the non-random selection procedure for the spatial subset, this estimate is biased. A key finding is that the effect of median income on median gross rents is now insignificant. In addition, the effect of rent control on the rental housing stock is now no longer significant, and the coefficient is now positive. This leads to an implied elasticity of supply (again, if we take the point estimates seriously) of -0.28, which is much smaller than the elasticity calculated for the full sample. The effect on the total stock of housing is also significant, and in the expected direction, with an implied elasticity of 0.21.

Equations 6-7 are estimated for this sample in *Table 9*.

	Dependent variable:		
	Δ Log Median Gross Rent Per Room	Δ Log Median Number of Rooms	Δ Vacancy Rate
	(6)	(7)	(8)
Has Controls	-0.053**	-0.007	-0.039***
	(0.022)	(0.141)	(0.007)
Δ Log Median Income	0.040	0.061	-0.155***
	(0.063)	(0.369)	(0.032)
Constant	0.041***	0.035	-0.033***
	(0.015)	(0.070)	(0.005)
Observations	317	319	312
R^2	0.039	0.034	0.011
Adjusted R^2	0.030	0.025	0.001

Table 9: First-differences estimates for secondary equations for the Top Quartile Neighborhood subset. In this subset, rent controls are also binding on median gross rent per room. Rent controls negatively affect growth in the number of rooms, but this is not significant either. Finally, rent controls exert a significant effect on the growth in the vacancy rate

Rent control's effect on median gross rent per room is similar to its effect on median gross rents in general. In this sample, the effect of rent controls on median number of rooms is now negative, but still insignificant.

Conclusion

In this essay, I used data from the American Community Survey to examine the differential impacts of rent control on growth in rents and growth in the housing stock in towns in the state of New Jersey during the period 2008-2018. Using a first-difference approach on a two-period panel data set, this analysis comes away with several key findings, and a path forward for future research on urban rents and rent control.

In the case of between-town differences in rent and housing growth, presented in *Table 3* and *4*, the results were not conclusive, in line with previous studies on New Jersey rent control—in the full sample of towns, rent control does not exert statistically significant downward pressure on either rent growth or growth in the stock of rental housing, though it does exert significant upward pressure on growth in the total stock of housing. The real shocker here is the huge implied elasticities of supply for housing and rental housing, meaning that small reductions in rent as a result of rent controls result in potentially massive reductions in the growth of rental housing. As it stands, if the point estimates of the regression coefficients are taken seriously, then rent control does result in something like Lindbeck's apocalyptic rent control vision, at least in terms of the *growth rate* of the housing stock.

It is unclear, however, how seriously we should take these estimates. The p-values for the estimates in *Table 4* are extremely high, failing to reject the null hypothesis that the effect of *has* *controls* is significantly different from zero for both median gross rents (*p = 0.905*), growth in rental housing *(p = 0.371)*, or growth in the housing stock *(p = 0.602)*. In fact, growth in the housing stock (both total and rental) seem to be only very weakly linked to growth in rents in general (see *Figure 3*); growth in rents do not vary (positively or negatively) with growth in the housing stock. Thus, the rapid construction of residential housing, cornerstone of market urbanist housing policy, may not be effective on its own at bringing down residential rents. On the other hand, growth in household income is a consistently significant driver of rent growth. This can perhaps tell us something about the current housing policy solutions on offer; in New Jersey, it appears that supply constraints are not the primary drivers of rent growth, but rising incomes are. What is the mechanism by which landlords can capture rising incomes as rents? For that, we must turn to a theory of ground rent.

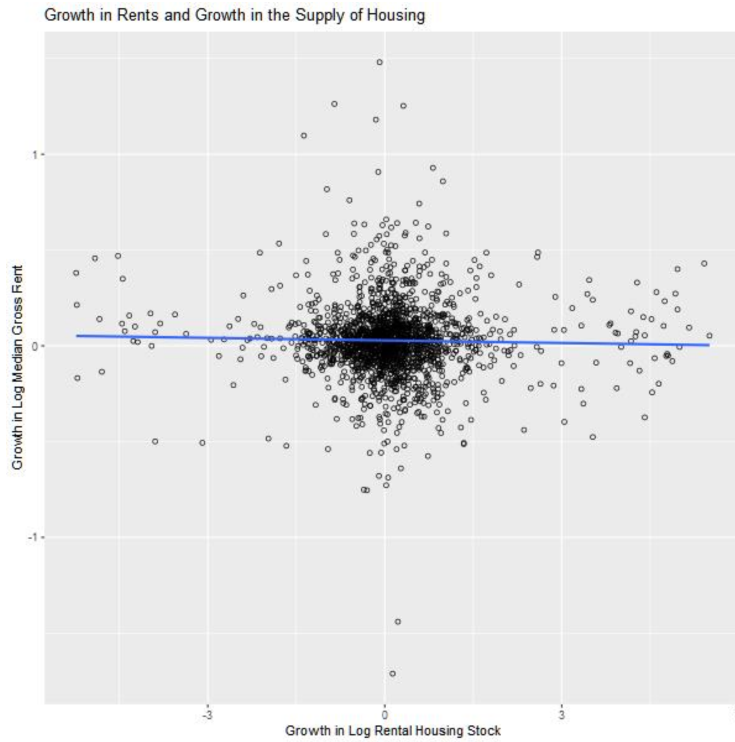

Figure 3: Change in median gross rent vs. change in the rental housing stock for New Jersey Census tracts.

It is likely that the analysis at the town level masks significant heterogeneity in neighborhood-level changes to median rents and the housing stock. This is particularly likely to be true in large New Jersey cities like Camden and Jersey City, with large numbers of highly dense neighborhoods. In *Tables 6* and *7*, we can see that this does make a difference; while the effect of rent controls on rents are still insignificant *(p = 0.586)*, I do find a significant negative effect on the growth in both the stock of rental housing and the stock of total housing. However, rent controls *are* binding in terms of median gross rents *per room.* Combined with the fact that the growth in the number of rooms per unit increases in rent-controlled districts, this suggests that the number of rooms per housing unit is an important channel through which the demand for housing quality operates. In other words, if rent control holds down growth in median gross rent per room and *increases* growth in the median number of rooms per housing unit (the denominator), the rent control holds down rents as housing quality (as measured by rooms per housing unit) increases. Here, too, we are confounded with a low signal-to-noise ratio; while the Moran's I statistic shows statistically significant spatial clustering of rent growth, the effect size is quite small, meaning that only a small percentage of a tract's variation in median gross rent is explained by variation in rents in the surrounding tracts. This makes the estimates in this paper somewhat less precise, since it relies on factors affecting rent growth to apply in broadly similar ways across exogenous political boundaries, and once again brings up the question: what exactly *is* it that is driving rent growth? The ACS data used in this paper supports income growth, but not so much changes in the stock of housing.

The strongest evidence for the efficacy of rent controls is in the case where of the geographic subset of jurisdictions bordering non-controlled tracts experiencing high rent growth. In this case, rent controls exhibit significant downward pressure on the rent growth rate, while all the other independent variables (except for changes in the number of rooms per unit) become insignificant. Further, in high-growth regions, rent control does not appear to have significant effects on the supply of either rental housing or housing in general. We can thus conclude that while New Jersey's second-generation controls may have a light touch in areas experiencing moderate rent growth, they likely play a role in shielding municipalities from large shocks to rent growth.

This also points the way forward for further extensions of this analysis. First, an *even more* granular look at data on rents and housing would increase the reliability of these estimates. Aggregation at even the Census tract level likely obscures a great deal of the variation in the implementation of rent control across jurisdictions. For example, it is impossible to know from this data how many housing units are controlled. The next step would be to assemble a sample of individual housing structures along with their characteristics and use this to compare rent-controlled *structures* to non-controlled ones. This is why the most recent, well-designed studies on rent control had to rely on expensive, proprietary, structure-level datasets from real estate data companies.

A second extension to this paper will be a discussion of the role that public goods play in determining the level of rent, and the effectiveness of rent control in maintaining *access* to public goods that tenants might not otherwise be able to access had they been displaced by rising rents. The small effect of spatial autocorrelation on rents is mystifying, but suggestive—if shocks to rent have only modest cross-border influences, then what is it that makes them so "sticky?" Public goods (e.g. good school districts, transportation, culture, etc.) are one possibility, as are local institutions that empower or disempower landlords.

Appendix A: List of Rent Controlled Towns in New Jersey

Atlantic City	Haddon	Highland Park
Egg Harbor City	Lindenwold	Metuchen
Hammonton	Pennsauken	Middlesex
Mullica	Middle	New Brunswick
Weymouth	Belleville	North Brunswick
Bergenfield	Bloomfield	Perth Amboy
Cliffside Park	Caldwell	Piscataway
Dumont	Orange	South Brunswick
East Rutherford	East Orange	Woodbridge
Edgewater	Irvington	Atlantic Highlands
Elmwood Park	Maplewood	Eatontown
Englewood	Newark	Hazlet
Fair Lawn	Nutley	Howell
Fairview	South Orange	Marlboro
Fort Lee	Verona	Red Bank
Hackensack	West Caldwell	Spring Lake
Hasbrouck Heights	West Orange	Wall
Leonia	Mantua	Morristown
Little Ferry	Washington	Randolph
Lyndhurst	West Deptford	Jackson
Maywood	Bayonne	Lakewood
Moonachie	Guttenberg	Clifton
New Milford	Hoboken	Little Falls
North Arlington	Jersey City	Passaic
Palisades Park	North Bergen	Paterson
Ridgefield	Union City	Wayne
Ridgefield Park	Weehawken	Woodland Park
River Edge	West New York	Pittsgrove
Rutherford	East Windsor	Franklin
Teaneck	Ewing	North Plainfield
Wallington	Hamilton	Franklin
Shamong	Lawrence Township	Hampton
Berlin	Robbinsville	Elizabeth
Camden	Trenton	Linden
Cherry Hill	East Brunswick	Plainfield
Gloucester	Edison	Roselle
Allamuchy	Springfield	
Lopatcong	Union	

Appendix B: Housing Markets and Spatial Correlation

Moran's I is a measure of spatial autocorrelation that examines the spatial dependence of an observation. In particular, it explains how much of the variation in a particular observation is explained by variation in that observations k nearest neighbors as measured by cartesian distance from the centroid of the geography. In this paper, I estimated Moran's I at both the town level and the tract level with $k = 5$. At the town level, I is calculated at 0.02, with a p-value of 0.185, meaning that 2% of variation in each ith town's growth in median rents can be explained by variation in rent growth of its 5 nearest neighbors. At the town level, I is calculated at 0.09, with a p-value of 0.001. This indicates that, at a high level of significance, that 10% of each *tract's* growth in median rents is explained by rent growth in its 5 nearest neighbors.

References

Alston, R. M., Kearl, J. R., & Vaughan, M. B. (1992). Is There a Consensus Among Economists in the 1990's? *The American Economic Review*, *82*(2), 203–209.

Ambrosius, J. D., Gilderbloom, J. I., Steele, W. J., Meares, W. L., & Keating, D. (2015). Forty years of rent control: Reexamining New Jersey's moderate local policies after the great recession. *Cities*, *49*, 121–133. https://doi.org/10.1016/j.cities.2015.08.001

Arnott, R. (1995). Time for Revisionism on Rent Control? *Journal of Economic Perspectives*, *9*(1), 99–120. https://doi.org/10.1257/jep.9.1.99

Arnott, R. (1998). Rent Control. In *The New Palgrave Dictionary of Economics and the Law*. Palgrave Macmillan UK. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.195.8420&rep=rep1&type=pdf

Arnott, R., & Igarashi, M. (2000). Rent control, mismatch costs and search efficiency. *Regional Science and Urban Economics*, *30*(3), 249–288. https://doi.org/10.1016/S0166-0462(00)00033-8

Autor, D. H., Palmer, C. J., & Pathak, P. A. (2014). Housing Market Spillovers: Evidence from the End of Rent Control in Cambridge, Massachusetts. *Journal of Political Economy*, *122*(3), 661–717. https://doi.org/10.1086/675536

Baar, K. K. (1977). Rent Control in the 1970's: The Case of the New Jersey Tenants' Movement. *THE HASTINGS LAW JOURNAL*, *28*, 55.

Basu, K., & Emerson, P. M. (2000). The Economics of Tenancy Rent Control. *The Economic Journal*, *110*(466), 939–962. https://doi.org/10.1111/1468-0297.00571

Been, V., Ellen, I. G., & House, S. (2019). Laboratories of Regulation: Understanding the Diversity of Rent Regulation Laws. *Fordham Urban Law Journal*, *46*, 40.

Borough of Fort Lee. (1978). *Borough of Fort Lee, NJ: Rent Control*. Borough of Fort Lee, NJ Code. https://ecode360.com/10069189

DeSalvo, J. S. (1971). Reforming rent control in New York City: Analysis of housing expenditures and market rentals. *Papers of the Regional Science Association*, *27*(1), 195–227. https://doi.org/10.1007/BF01954607

Diamond, R., McQuade, T., & Qian, F. (2018). *The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco* (No. w24181; p. w24181). National Bureau of Economic Research. https://doi.org/10.3386/w24181

Early, D. W. (2000). Rent Control, Rental Housing Supply, and the Distribution of Tenant Benefits. *Journal of Urban Economics*, *48*(2), 185–204. https://doi.org/10.1006/juec.1999.2163

Friedman, M., & Stigler, G. J. (1946). *Roofs or ceilings? The current housing problem,*. Foundation for Economic Education.

Gilderbloom, J. (1981). Moderate Rent Control: Its Impact on the Quality and Quantity of the Housing Stock. *Urban Affairs Quarterly*, *17*(2), 123–142. https://doi.org/10.1177/004208168101700201

Gilderbloom, J. I., & Ye, L. (2007). Thirty Years of Rent Control: A Survey of New Jersey Cities. *Journal of Urban Affairs*, *29*(2), 207–220. https://doi.org/10.1111/j.1467-9906.2007.00334.x

Glaeser, E., & Gyourko, J. (2002). The Impact of Zoning on Housing Affordability. *National Bureau of Economic Research Working Papers, Working Paper 8835*. https://www.nber.org/papers/w8835.pdf

Glaeser, E. L., & Luttmer, E. F. P. (1997). *The Misallocation of Housing Under Rent Control* (Working Paper No. 6220). National Bureau of Economic Research. https://doi.org/10.3386/w6220

Gyourko, J., & Linneman, P. (1989). Equity and efficiency aspects of rent control: An empirical study of New York City. *Journal of Urban Economics*, *26*(1), 54–74. https://doi.org/10.1016/0094-1190(89)90027-2

Hayek, F. A. (1975). *Rent control a popular paradox: Evidence on the economic effects of rent control*.

Hubert, F. (1993). The Impact of Rent Control on Rents in the Free Sector. *Urban Studies*, *30*(1), 51–61. https://doi.org/10.1080/00420989320080031

Joint Center for Housing Studies. (2019). *The State of the Nation's Housing*. Harvard University. https://www.jchs.harvard.edu/sites/default/files/reports/files/Harvard_JCHS_State_of_the_Nations_Housing_2019%20%281%29.pdf

Krugman, P. (2000, June 7). Opinion | Reckonings; A Rent Affair (Published 2000). *The New York Times*. https://www.nytimes.com/2000/06/07/opinion/reckonings-a-rent-affair.html

Lindbeck, A. (1977). *The Political Economy of the New Left* (2nd Edition). New York University Press.

Mankiw, N. G. (2011). *Principles of Microeconomics* (6 edition). Cengage Learning.

Nagy, J. (1997). Do Vacancy Decontrol Provisions Undo Rent Control? *Journal of Urban Economics*, *42*(1), 64–78. https://doi.org/10.1006/juec.1996.2014

Olsen, E. O. (1972). An Econometric Analysis of Rent Control. *Journal of Political Economy*, *80*(6), 1081–1100.

Rapaport, C. (1992). Rent Regulation and Housing-Market Dynamics. *The American Economic Review*, *82*(2), 446–451.

Sims, D. P. (2007). Out of control: What can we learn from the end of Massachusetts rent control? *Journal of Urban Economics*, *61*(1), 129–151. https://doi.org/10.1016/j.jue.2006.06.004

Willis, J. W. (1950). Short History of Rent Control Laws. *Cornell Law Review*, *36*(1), 42.

Zaveri, M. (2019, February 27). Oregon to Become First State to Impose Statewide Rent Control. *The New York Times*. https://www.nytimes.com/2019/02/26/us/oregon-rent-control.html