Is Inclusionary Zoning a Proper Remedy for the Affordable Housing Crisis? —A Case Study of IZ Programs in New Jersey and North Carolina

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Abstract

The recent decade witnessed a worsening of the affordable housing crisis across the country. Inclusionary zoning (IZ) has been a popular municipal remedy for the crisis. However, it is unclear whether IZ actually adds to the affordable housing stock, and whether it achieves its goal at the expense of average homeowners. Through a case study of New Jersey and North Carolina, this paper aims to address these two questions. The results suggest that there is no statistically significant positive relationship between the presence of IZ and the housing price in the two states, but its beneficiary effects are also debatable.

JEL classification: D10 ; R2; R21

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I. Introduction

More than ten years after the 2008 subprime mortgage crisis, a different kind of housing crisis is unfolding in many parts of the United States. Only this time, we should no longer be concerned with the overheating of the housing market, but rather its sluggish response to meeting the housing needs of the low-income population. According to a study released last year by the Joint Center for Housing Studies, although an average U.S. household does not allocate more than 30 percent of their household income to housing, most lower-income families—those whose annual incomes are lower than $30,000—pay more than half of their income on either purchasing or renting their dwellings (Joint Center 2018). Department of Housing Urban Development defines an "affordable dwelling" to be one that a household can obtain with 30 percent or less of its total income (HUD). In this regard, it is evident that the affordable housing shortage is developing into a real crisis.

The federal government has launched quite a few programs to mitigate this undersupply. For instance, the HOME Investment Partnership Program distributes grants to states and local governments to fund the building, buying and rehabilitation of housing for rent or homeownership, as well as providing direct rental assistance to low-income families. The National Housing Trust Fund directly provides funds to extremely low-income families and families with incomes below the poverty line (HUD). In addition, the Housing Choice Voucher Program (Section 8) provides rental assistance by making payments to private landlords on behalf of low-income households (HUD). Despite the presence of multiple federal housing programs, their mechanisms are all similar—they aim to address the problem through subsidies rather than creating a *market incentive* for developers to add to the affordable housing stock.

In addition to direct federal housing subsidies, inclusionary zoning (IZ) has become a commonly used municipal-level tool to relieve the shortage of affordable housing. As explained in a 2018 report of the Furman Center for Real Estate and Urban Policy, IZ links the production of affordable housing to the production of market-rate housing by either requiring or encouraging new residential developments to make a certain percentage of the housing units in a given project affordable to low- or moderate-income residents. In turn, the local government compensates them with density bonuses, fast-track permitting, fee waivers, etc. IZ programs also vary in their

stringency. Under a voluntary program, developers could choose to operate under the existing zoning rules or to seek a density variance on the condition that they set aside part of their development for low-income housing. Yet a more rigorous program may *require* a certain percentage of a developer's total housing production to be affordable and such a program usually offers less compensation (Mulligan 2010).

The regions that were first to recognize a surge in housing price, and later an insufficiency in affordable housing are usually coastal urban areas. As expected, their governments were also among the first to adopt housing policies such as inclusionary zoning. A 2017 Lincoln Institute study suggested that the first inclusionary zoning programs emerged outside of Washington, DC and San Francisco in the mid-1970s (Thaden and Wang 2017). A growing number of local governments adopted similar approaches when the housing markets heated up in the late 1990s and early 2000s (Calavita and Mallach 2009). IZ programs are by far highly geographically concentrated. As of 2016, the vast majority of them were located in New Jersey (45.26 percent), Massachusetts (26.75 percent) and California (16.8 percent) (Thaden and Wang 2017). Meanwhile, recent years has witnessed an inland shift of the affordable housing crisis. A 2018 report by National Public Radio indicates that the housing crisis is no longer restricted to metropolitan areas where home prices and rents have always been prohibitively high—rather, it has spread to "midsize, fast-growing cities farther inland," such as Durham, North Carolina. (Siegler 2018). Evidently, it is crucial to assess the effectiveness of IZ in addressing the affordable housing shortage, since it will shed light on future governmental policies across the country at large.

A debate over the impacts of inclusionary zoning has prevailed ever since the adoption of the policy. Given IZ promotes the production of affordable housing stock, it remains uncertain what its other market effects are. A valuable question to ask is if the policy has distorted the free housing market or corrected an existing market failure. If it is the first case, we would probably detect an increase in housing prices due to the implementation of IZ since developers will pass at least part of the burden to their consumers by charging a higher price. In this paper, I argue that inclusionary zoning has contributed to restoring the market to its efficient level, although an over-restoration itself could give rise to market failure in an opposite direction.

The housing market where IZ first emerged was not entirely efficient in itself. Since the early 1900s, exclusionary zoning programs have spread across the United

States. Since then, transportation has become more convenient, social mobility has increased, and it is easier for industrial and apartment developers to utilize vacant lots in partially developed single-family neighborhood (Fischel 2004). Homeowners in the neighborhood are thus concerned that immigrants will take advantage of their public educational resources and worsen the environment. According to Albert Breton (1973), zoning was in essence an alternative to a home-value insurance that protects homeowners against devaluation of their dwellings. Fischel (2004) later built upon Breton's argument and raised his famous "homevoter hypothesis," according to which homeowners "vote" for the exclusionary zoning laws to exclude free riders from these resources.

Nevertheless, exclusionary zoning has its disadvantages. For one thing, intentional or unintentional zoning laws have created neighborhoods with concentered poverty. As Sager (1969) argued, exclusionary zoning ordinances "exclude a class of potential residents whose income thresholds are exceeded because of the cost increment attributable to the ordinances." He explained that such regulations distort the market by reducing the supply of low-cost housing and suppressing the demand of the poor for housing that is available due to barriers to integration, etc. (Sager 1969). Therefore, IZ programs actually help address the market failure produced by restrictive regulations.

I will focus my analysis on the IZ programs adopted by New Jersey and North Carolina. I pick the two states for two reasons. Firstly, they represent the two types of housing markets in the United States. New Jersey is an example of the first wave of states to experience an undersupply affordable housing and it's housing prices are historically high. On the other hand, North Carolina is a representative state with many fast-growing urban areas that are absorbing residents immigrating from coastal areas. Studying these two areas will thus provide a more comprehensive picture of the efficacy of IZ programs. Moreover, compared to other states with similar housing situations the two states have a relatively wide-spread implementation of IZ policies, providing a fair amount of data for analysis. Meanwhile, it is worth highlighting that I do not attempt to compare the two states against each other. As Schuetz, Meltzer and Been (2009) noticed, New Jersey's state-wide housing laws do not hinder local jurisdictions to promote affordable housing even without IZ programs; in contrast, North Carolina grants weak local authority and prohibits local rent control. Therefore, N.C. IZ programs may be overall less binding than the ones adopted in New Jersey.

I hypothesize that after controlling for the effects of the existing housing regulations, more stringent IZ programs will produce more affordable housing units in a given area. At the same time, the developers are more likely to seek to compensate for a loss in profits by price-discriminating wealthier consumers. As a result, the total production of housing units may decrease and the price of the market-priced housing will also increase. To test my hypothesis, I will present an empirical study on the effects of IZ on local housing markets in the two states.

The paper proceeds as follows. In Section 2, I will briefly introduce the IZ policy background of the two states. Section 3 will offer a review of previous literature on the effects of inclusionary zoning. Section 4 will lay out a theoretical prediction of the impacts of IZ programs. In Section 5, I will introduce the data sets used in the study and I will present the results of my empirical analysis in Section 6. Lastly, in Section 7, I will explain the implications of my findings, discuss the potential limitations of this study and conclude.

II. Background

Although inclusionary zoning has been attracting wide attention only for less than a decade, it has a history of approximately 50 years. However, the pace at which local jurisdictions are introduced to IZ programs varies dramatically across states. As mentioned in the last section, IZ programs in New Jersey, California and Massachusetts account for approximately 80 percent of all programs. In contrast, over 30 states have either none or only one IZ program adopted (Thaden and Wang 2017).

Moreover, inclusionary zoning is one among many potential housing policies a local government can adopt to motivate the production of affordable housing. While some jurisdictions strictly request developers to build affordable housing units either on-site or off-site, many others choose to increase policy flexibility by providing developers with alternatives (inclusionaryhousing.org).[1] Some of them are fee-based policies—such as impact fees and in-lieu fees (Thaden and Wang 2017;

[1] Under on-site requirements, developers are obliged to build affordable housing units *within* their new market-rate residential projects; under off-site requirements, developers can opt to build mandated affordable housing units at an off-site location, usually by launching a new project where all the units are affordable (inclusionaryhousing.org). https://inclusionaryhousing.org/designing-a-policy/off-site-development/

inclusionaryzoning.org). [2] The existence of fee-based alternatives in a given jurisdiction needs to be treated as a control variable in my analysis.

In addition, how sub-state jurisdictions design and carry out their IZ programs largely depends on the state-wide legal framework. According to inclusionaryzoning.org, state legislations may range from explicitly permitting inclusionary housing policies (such as California, Massachusetts and Florida) to prohibiting at least some form of local inclusionary housing policies, especially mandatory ones (such as Virginia, Indiana and Tennessee). In this study, state legislatures in both New Jersey and North Carolina are neither especially keen nor antagonistic toward IZ, leaving local governments some freedom to fine-tune the terms and requirements of the policy to meet local needs.

2.1 New Jersey

Affordable housing shortage has long been an issue for New Jersey. Following a 1975 New Jersey Supreme Court case—*Southern Burlington County N.A.A.C.P. v. Mount Laurel Township*—the state supreme court declared that municipal land use regulations that prevent affordable housing for lower income individuals and families are unconstitutional.[3] In 1985, the state legislature passed the Fair Housing Act, under which very municipality is obliged to ensure that low- and moderate- income families have access to a *fair share* of affordable housing.[4]

Accordingly, the state legislature established in 1985 the Council on Affordable Housing (COAH) to facilitate the implementation of the Act. Municipalities enter into the COAH process on a voluntary basis by petitioning COAH for a certification of a housing element—a framework specifying the housing needs and status quo—and a fair share plan to meet their target of affordable housing development. A municipality

[2] There are differences between impact fees, or linkage fees, and in-lieu fees. The former is charged to mitigate the impact of commercial and/or residential development on the increased demand for affordable housing; the latter is an alternative for developers to choose instead of directly constructing affordable housing units (Thaden and Wang 2017). As inclusionaryhousing.org summarizes, when a developer is required to build units on-site but allowed to pay a fee instead, the fee is called an "in-lieu fee;" when a program is structured to require fees instead of onsite units, the fee is called an "impact fee."

[3] In this court case, the Mount Laurel Township was charged with executing land use regulation that unlawfully excluded low- and moderate-income family. For more details, see https://www.quimbee.com/cases/southern-burlington-county-naacp-v-township-of-mount-laurel

[4] The NJ Fair Housing Act stipulates that "every municipality in a growth area has a constitutional obligation to provide through its land use regulations a realistic opportunity for a fair share of its region's present and prospective needs for housing for low- and moderate- income families." For more details, see https://www.state.nj.us/dca/affiliates/coah/regulations/fha.pdf

is protected from lawsuits before the COAH decides to grant or deny certification. Once granted, the certification lasts for ten years and may be withdrawn if the municipality "fails to assure the continuing realistic opportunity for its fair share housing obligation" (New Jersey Department of Community Affairs). Essentially, it is up to the local municipalities to decide what specific policies to adopt to meet their targets.

2.2. North Carolina

Contrary to New Jersey, the shortage in affordable housing in North Carolina has not turned alarming until recent years. The state legal framework is also less robust in stimulating the construction of affordable housing stock. In 2011, the state legislature passed the State Fair Housing Act, which stipulates it to be "illegal to discriminate in housing because of race, color, religion, sex, national origin, physical or mental handicaps, family status, *or* except as otherwise provided by law, the fact that a development or proposed development contains affordable housing units for families or individuals with incomes below 80 percent of area median income" (North Carolina Administration).[5] "Affordable housing" has officially become a protected class in North Carolina's housing legislature henceforth.

In 2018, the North Carolina state legislature passed yet another act, the Affordable Housing Act, which aims to provide additional funding for the Workforce Housing Loan Program and the N.C. Housing Trust Fund, as well as to direct more research to studying affordable housing issues in the state (North Carolina General Assembly).[6] Nevertheless, there still lacks a state-wide piece of legislation that explicitly requires municipalities to increase affordable housing stock. However, as we shall see presently, several local jurisdictions in North Carolina has managed to execute voluntary, or even mandatory, inclusionary housing policies.

III. Literature Review

Previous studies on the market effect of IZ programs are relatively scarce due to the extensive variation in the programs' terms and requirements on the local level, and

[5] For more details, see https://files.nc.gov/ncdoa/documents/files/FairHousingAct.pdf
[6] For more details, see https://www.ncleg.net/Sessions/2017/Bills/Senate/PDF/S784v1.pdf

the lack of data on the presence and characteristics of IZ programs and their impacts. A significant portion of the literature focuses on the housing market in California, where IZ programs are prevalent across the state and have been in effect for more than three decades. IZ-related data is also more available for Californian municipalities compared to many other states that are actively involved in inclusionary housing.

The implementation of IZ policies will presumably affect two key variables: the stock of affordable housing and local housing prices. Existing studies are divided in their findings. On the one hand, a school of researchers claims that inclusionary zoning functions like a tax on housing construction and tends to drive up market prices of housing. Robert Ellickson (1981) was a precursor in this tradition. In his often-cited theoretical paper *The Irony of Inclusionary Zoning*, he claimed that ironically, by increasing housing prices, IZ primarily harms moderate-income families—who the policies were intended to assist—by increasing housing costs.

Later empirical studies emerged in line with Ellickson's assertion. Powell and Stringham (2004) raised an abrupt criticism of IZ policies by asserting that it "hurts homebuyers and will price out most low-income families." Despite the absence of rigorous statistical analysis[7] in their study of the housing trend in Los Angeles County and Orange County, they contended that inclusionary housing produces very few affordable units but makes market-priced homes more expensive, and suppresses new housing production at large. In other words, IZ entails tremendous costs on the market and depending on the existing supply and demand elasticity, the costs are largely shared by homebuyers and landowners, instead of developers (Powell and Stringham 2004).

Similarly, Bento, Lowe, Knapp and Chakraborty (2009) studied IZ programs in California between 1988 and 2005, finding that IZ programs have increased the ratio of multifamily to single-family housing production. Meanwhile, IZ has raised housing rates by approximately 2.2 percent and the impacts were ampler in higher-priced housing markets. As a result, they claimed that housing developers do not seem to be responsive to inclusionary requirements. However, they do pass the burden to consumers via a higher price—therefore, even if IZ helps promote social welfare, the benefits come with measurable costs (Bento et al. 2009).

[7] The study is later critiqued for its arbitrary assumption and lack of rigorousness. For example, the researchers failed to control for temporal and geographic fixed effects when measuring housing production effects after the adoption of IZ programs. It is therefore impossible to determine if the decline in new housing production is actually due to inclusionary housing or an overall downward trend. See Basolo and Calavita (2004).

Although some researchers made a strong claim that inclusionary zoning—effectively a development tax—has exacerbated the affordable housing crisis instead of mitigating it, another school of scholars are more positive toward the policy. Dietderich (1996) raised a direct rebuttal against Ellickson (1981), arguing that both voluntary and mandatory IZ programs can increase the aggregate housing stock available to low income renters or buyers.

Later scholars in this school contend the shortage of affordable housing is a market failure that has to be fixed through governmental intervention such as IZ programs (Laura Padilla 1995; Barbara Kautz 2002). Empirical studies by these scholars suggested that IZ programs may be less effective than expected, yet their impacts are not entirely negative. For example, Mukhija, Regus, Slovin and Das (2010) also focused on Los Angeles and Orange counties but were more optimistic about the effects of inclusionary zoning in general. Unlike Powell and Stringham (2004), their findings indicated that several of the existing programs in the two Californian counties have "successfully, albeit modestly, added to their affordable housing stock" (Mukhija et al. 2010). In particular, they concluded their study advocating for a wider adoption of mandatory instead of voluntary IZ programs that are tailored to meet local needs.

One of the most well-developed studies on the effects of IZ on local housing markets is conducted by Schuetz, Meltzer and Been (2009). They focus their study on the San Francisco metropolitan area and suburban Boston. Due to the prevailing difficulty in obtaining IZ-related data, previous studies have heavily relied on the same survey data[8] collected by the California Coalition for Rural Housing (CCRH) and the Non-Profit Housing Association of Northern California (NPH), which detailed the local variation of the policies and their production effects (2003, 2007). Nevertheless, the dataset lacked several key variables such as the adoption date of the policy and mandatory status. A particular strength of Schuetz et al. (2009) is that they complement the existing dataset with the results from a supplementary telephone survey by the New York University Furman Center. They further compare their dataset with several additional sources to eliminate inconsistency. According to their findings, in both suburban Boston and the San Francisco area, the presence of IZ tends to increase housing prices during regional price appreciation, and in San Francisco at least, IZ

[8] See Bento et al. (2009), Mukhija et al. (2010) and Hollingshead (2015) for instance.

decrease prices when the regional housing markets are cooler. In addition, their study demonstrates that the stock of affordable housing produced under IZ has been modest and depends on how long the policy is in place (Schuetz et al. 2009).

Existing studies on inclusionary zoning diverge in their conclusions partly due to the inaccessibility of comprehensive data on the policy-implementation in an area over a significant time span. However, as the affordable housing crisis gradually unfolds in the recent decade, more researchers have diverted their attention to study the policies local governments enacted to address the problem, including IZ. My study will build upon previous literature and with the access to a better dataset, I wish to generate a more accurate analysis of the impacts of inclusionary zoning on a housing market.

IV. Theoretical Framework

Lying at the core of the debate over the effects of inclusionary zoning is the question of whether there is a market failure to be fixed. If as proposed by Ellickson (1981) and his successors, inclusionary zoning programs—especially mandatory ones—act like a development tax, then it will create a deadweight loss on the market. Since the government itself is not bearing any costs, the additional costs generated are necessarily shared by homebuyers, landowners and developers. Their respective burdens depend on the elasticity of supply and demand. As elementary economic theories suggest, whoever is less elastic in her supply or demand tends to incur a greater portion of the burden. Powell and Stringham (2004), for example, have argued that low-income households—who are most inelastic in their demand for housing—turn out to be the victims of inclusionary zoning.

The reality, of course, is more complex. In most states, affordable housing is segregated from market-rate housing. Namely, they are not traded in a market open to *all* consumers. For example, New Jersey's state legislature specified that in order to be eligible to live in affordable housing, a household's earning must be below a certain level, usually with "low- and moderate- incomes" (NJ State of Community Affairs). Low income is defined as at or below 50 percent of median family income. Moderate income is over 50 percent, but no more than 80 percent of median family income. Some are for those with "very low" incomes, at or below 30 percent of median county income

(NJ State of Community Affairs). In other words, low-income families will have access to a larger stock of affordable housing without worrying about a higher price—they are therefore the definite beneficiaries of IZ programs. Hence, consumers of the market-rate housing might be taking over part of the costs on behalf of the former—usually by facing a higher housing cost.

On the other hand, the long-term existence of prevalent exclusionary zoning rules further complicates the problem. Suppose exclusionary zoning has already created a market failure, as described by Dietderich (1996), then by loosening regulations, IZ actually helps lower the fixed costs of construction and removes the barrier to entry. Under this assumption, developers will actually be willing to construct more affordable housing in exchange for a more lenient zoning rule, where their net profits are actually higher. Therefore, they would not seek compensation elsewhere by increasing the market-rate housing. The hypothesis is more likely to hold when the program is voluntary rather than mandatory.

V. Data

As demonstrated in previous sections, the lack of inclusionary zoning-related data poses a substantial challenge to researchers. Documentation of the presence and the production effects of IZ programs is inadequate and not up to speed. Many previous studies rely on a handful of datasets, which themselves lack key variables. In this regard, this study has benefited from the growing academic interest in affordable housing and IZ, and the increasing accessibility of IZ-related data.

5.1 Data: Presence and Characterization of IZ Policies

In this study, data on the presence and characterization of IZ policies derive from two sources. For New Jersey, the primary source is the New Jersey State Department of Community Affairs.[9] Thanks to the state-wide Fair Housing Act, the Department has kept close track of local implementation of inclusionary housing policies and the affordable housing developments in each county through 1993 to 2010. According to

[9] See https://www.nj.gov/dca/divisions/lps/hss/transinfo/reports/units.pdf for the documentation of all the proposed and completed affordable units in New Jersey.

Thaden and Wang (2017), 315 New Jersey jurisdictions reported to have collected a total of $697,450,002 in housing trust funds. 347 jurisdictions reported a total of 34,631 units of affordable housing construction. Of the 401 jurisdictions with either inclusionary housing units or fees, 251 jurisdictions reported having both.

As explained in the previous section, the state legislature in New Jersey only specifies the production target for local jurisdictions and the latter are free to decide on the specific strategies. There are several mechanisms that are more commonly used. Here I have borrowed the idea from Thaden and Wang (2017) in deciding which of the mechanisms qualify as an "IZ program." Those include "inclusionary development," which requires developers to produce on-site affordable housing *within* new construction; "accessory dwelling units,[10]" or accessory apartments, a mechanism that encourages cheaper and more dispersed housing supply by loosening previous zoning restrictions on backyard cottages; "redevelopment," a process through which new construction on a used site operates under inclusionary zoning rules that encourage affordable housing development (Thaden and Wang 2017). I also added to my list another category of policy that is not identified in Thaden and Wang (2017), a type of programs called "ECHO Programs," abbreviated for "Elder Cottage Housing Opportunity Programs" (NJ State Department of Human Services[11]). This program is in essence a special kind of accessory dwelling program—designed specifically for the elderly. Other types of policies have also contributed to the production of affordable housing, including "new construction[12]", "rehabilitation," "supportive/special needs housing[13]", "assisted living residence[14]", and "market to affordable programs"[15]. Although several of the programs are often used as an alternative to on-site, "inclusionary zoning," programs, due to their nature, they themselves are not identified as IZ programs in the study.

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[10] Backyard cottages are usually outlawed in urban and suburban zoning codes. Through "accessory dwelling units," some municipalities have sought to relax these restrictions. See https://ahpnj.org/news/entry/accessory-dwelling-units-and-affordable-housing

[11] For details, see the NJ State Department of Human Serves: https://www.state.nj.us/humanservices/doas/home/housingglossary.html

[12] Here new construction refers to "off-site" affordable housing construction. It is often an alternative to on-site, namely IZ, housing programs.

[13] An allocation of supervised housing for people with development disabilities, the mentally ill, or other special needs. See https://www.state.nj.us/dca/divisions/codes/publications/guide.html

[14] Supervised housing for the elderly, in nature similar to supportive/special needs housing.

[15] Under "market to affordable programs," municipalities collect monies from developers and save them in housing trust to buy market rate units, write down the cost to make the units affordable to low- or moderate-income households, and then resell the units to a qualified purchaser. These funds are often collected in the form of impact fee or in-lieu fee, as mentioned early in the paper. For example, see http://www.hardyston.com/wp-content/documents/Market%20to%20Affordable%20Guide.pdf

Among the 566 municipalities in New Jersey, 461 of them have adopted inclusionary housing programs. Table 1 (below) summarizes the characteristics and production effects of the programs. The first section of the table lists the target units of new construction and rehabilitation and each municipalities' accomplishment. The second section demonstrates the number of programs in IZ, off-site new construction, rehabilitation and supportive/special needs respectively. As shown here, municipalities have produced approximately half of the proposed amounts in both new construction and rehabilitation. Inclusionary zoning, after offsite new construction and supportive/special needs housing, ranks the third most adopted program.

One primary shortcoming of the data provided by the NJ State Department of Community Affairs, however, is that it does not specify the year when the program is adopted. Therefore, I consulted another documentation on the three round rules of COAH.[16] These lists recorded the certified municipalities in each round, including the date when they submit their petitions and are granted with certification. When both dates are available, I chose to use the petition date as an indicator, because municipalities may start to implement the proposed policies before receiving the certification. When only the latter is available, I use certification dates instead.

Table 1. Production Effects and Program Presence by Municipality, N.J.; **N=461**

Variable	***Mean***	***Std. Dev.***	***Min***	***Max***
New Units Planned	21.80043	41.40809	0	360
New Units Completed	11.05857	32.95872	0	360
Rehab Planned	8.147505	40.71892	0	650
Rehab Completed	3.739696	21.57095	0	322
Num IZ	2.926247	3.470839	0	26
Num Offsite_New	2.531453	5.363482	0	76
Num Rehab	1.069414	1.441451	0	16
Num SpecNeed	2.928416	4.414068	0	34
Num FeeBased	.2624729	.5176048	0	3

Source: New Jersey State Department of Community Affairs

[16] For the full list, see https://www.nj.gov/dca/services/datahub.html#ProposedandCompletedAffordableUnits

In the meantime, as indicated above, inclusionary housing policies are not equally prevalent in North Carolina. For the data on the presence and characterization of the programs, I rely on the 2016 survey conducted by Grounded Solutions Network (previously known as National Community Land Trust Network), a non-profit organization specializing in housing-related policy investigation and advocacy. According to the survey, by 2016, there are four counties in North Carolina—Chatham, Dare, Orange and Watauga county—that have implemented county-wide inclusionary zoning policies. Several municipalities, such as Davidson and Chapel Hill, have managed to enact mandatory IZ programs, despite the absence of a state legislation requirement (Grounded Solutions 2016).[17] Table 2 (below) is a summary of all the programs in place.

Table 2. Sub-State Inclusionary Zoning Programs and Terms in N.C.

County	*Municipality*	*Government Type*	*Year Adopted*	*Mandatory?*	*Rental or For-Sale*
Buncombe	Asheville	City/Township	2010	Voluntary	Rental
Buncombe	Black Mountain	City/Township	2010	Voluntary	For-Sale
Chatham		County	2004	Voluntary	
Dare		County	2003		
Dare	Kill Devil Hills	City/Township	2008		
Dare	Manteo	City/Township	2005	Mandatory	For-Sale
Durham	Durham	City/Township	2006	Voluntary	Both
Forsyth	Winston-Salem	City/Township	1994	Voluntary	Both
Mecklenburg	Charlotte	City/Township	2013	Voluntary	Both
Mecklenburg	Davidson	City/Township	2001	Mandatory	For-Sale
Mecklenburg	Davidson	City/Township	2015	Mandatory	For-Sale
New Hanover	Wilmington	City/Township			
Orange	Carrboro	City/Township	2007		
Orange	Chapel Hill	City/Township	2011	Both	Both[18]
Orange		County			
Watauga		County	2014		

Source: Ground Solutions Network Survey (2016)

[17] For a complete list of IZ policies across the United States, see the Inclusionary Housing Database Map, Ground Solutions Network:
https://gsn.maps.arcgis.com/apps/webappviewer/index.html?id=331f8a985a244e8fb6e6a2ad23731179

[18] For Chapel Hill, rental development is on a voluntary basis but for-sale development is mandatory.

5.2 Data: Housing Price and Census Variables

In order to obtain another key variable in this study—median housing price—for both New Jersey and North Carolina, I rely on the housing transaction data collected by CoreLogic, Inc. The dataset documents transactions dating back to the late 1980s up until 2012. To control for the other factors that may influence the housing price, I have also extracted census data on median household income and race from Integrated Public Use Microdata Series (IPUMS).

5.3 Data Cleaning and Management

For both states, I refer to three sources of data to complete my analysis. One major obstacle is the mismatching of the geographic attributes. In terms of the policy-related data from the NJ State Department of Community Affairs, they used "municipality" to indicate all the townships, towns, boroughs and cities. Meanwhile, I extracted the census variables from the 2000 and 2005-2009 five-year ACS data on the place level. "Place" is the geographical level that matches closest with "municipality" but the former does not include certain townships incorporated in the latter. In addition, there is a specific category of place called "census designated places," or CDPs, which are statistical entities designated specifically for census purposes. I was not able to match those perfectly with the program-related data. I have to sort out the mismatched observations to avoid distortion.

On the other hand, the historical housing transaction data from CoreLogic, Inc. does incorporate the "census place code" for each transaction, making it easier to merge with the census data. Nevertheless, in order to match yearly transactions to five-year ACS data, I had to create a matching variable "censustrigger" so that transactions that took place between 2003 and 2012 are all paired up with the 2005-2009 census variables. Finally, I sorted out the observations with missing variables. Table 3 (below) summarizes all the main variables I use later in my analysis.

Table 3. Variable Definitions and Sources

Variable	*Definition & Sources*
Lnincome	Log of median household income in the last 12 months
lnWhite_alone	Log of the total number of population who is White alone
lnBlackAA_alone	Log of the total number of population who is Black or African American alone
lnNative_alone	Log of the total number of population who is American Indian and Alaska Native alone
lnAsian_alone	Log of the total number of population who is Asian alone
lnPI_alone	Log of the total number of population who is Native Hawaiian / Pacific Islander alone
lnOtherrace_alone	Log of the total number of population who is some other race alone
lnRace_more	Log of the total number of population who is of two or more races
lnurban	Log of the number of population who lives in urban areas
lnrural	Log of the number of population who lives in rural areas
NewConstruction	Planned units of new construction
NewCompleted	Completed units of new construction
RehabPlanned	Planned units of new rehabilitation
RehabCompleted	Completed units of new rehabilitation
adoption_length	The length of time during which any programs are in place
num_programs	Number of programs
num_IZ	Number of IZ programs adopted
num_OffsiteNew	Number of off-site construction programs adopted
num_Rehab	Number of rehabilitation programs adopted
num_Specneed	Number of Supp/Spec Need programs adopted
num_Feebased	Number of impact/in-lieu fee programs adopted

Source: New Jersey State Department of Community Affairs; IPUMS Census Data

VI. Analytical Results

6.1 New Jersey

According to the New Jersey State Department of Community Affairs, most of the affordable housing is for rent and only a small number are for sale. Since the CoreLogic data I use in this project focuses on for-sale transactions and do not have comprehensive data on rental units, I focus on the "NewCompleted" variable to determine how much new construction of affordable stock arose due to the implementation of the programs. These numbers are associated with *each program* proposed. In other words, it does not reflect the overall affordable housing production, but it could serve as an indicator of how well IZ programs are in promoting affordable housing production *relative to* other programs. I then matched program-related data of each municipality with the census data from the 2000 ACS survey. The census I included are household income, race and urban/rural status. As mentioned in an earlier section, the mismatching in geographical identification between the two datasets is a potential source of bias. I had to sort out a portion of mismatched data, which would complement the analysis if included.

Below (Table 4) documents how different determinants influence the production of affordable housing. Here I exclude the completed number of rehabilitation units since there is a strong collinearity between it and the number of rehabilitation programs in place. I conducted four experiments. In the first two regressions, I tested the correlation between only census variables (Column 1) and only policy-related variables (Column 2). We do not detect a statistically significant relation in either case. In Column 3 and 4, I tested the effects of inclusionary housing programs on the new production of affordable housing, controlling demographic effects. Both cases demonstrate a statistically significant positive relationship between the number of IZ and the affordable housing production. An additional finding is that the only two demographic variables that are correlated with the production of affordable housing are income level and the number of Black or African American population in a given region. As a whole, the results in this table partially verify the hypothesis that inclusionary zoning does help mitigate the undersupply of affordable housing.

Table 4. N.J.: Determinants of Newly Completed Affordable Housing Units;

Dependent Variable: NewCompleted (i.e. completed units of new construction)

Variables	*(1)*	*(2)*	*(3)*	*(4)*
lnincome	-7.463		8.618	34.72*
	(-0.11)		(0.53)	(2.28)
lnWhite_alone	-77.50			-18.67
	(-0.87)			(-0.78)
lnBlackAA_alone	8.531			14.08*
	(0.67)			(2.92)
lnNative_alone	-4.004			
	(-0.38)			
lnAsian_alone	24.82			
	(1.51)			
lnPI_alone	-19.93			
	(-1.55)			
lnOtherrace_alone	-9.750			
	(-0.74)			
lnurban	57.04		0.807	0.162
	(0.64)		(0.19)	(0.01)
lnrural	12.73		2.163	5.994
	(1.23)		(0.65)	(1.48)
num_IZ		-0.0126	3.990**	5.012***
		(-0.01)	(3.31)	(4.99)
num_Offsitenew		3.437	-0.802	-1.265
		(1.97)	(-0.23)	(-0.46)
num_Rehab		-5.695	1.097	-19.06
		(-1.34)	(0.11)	(-1.90)
num_Specneed		-1.054	0.856	0.580
		(-1.10)	(0.56)	(0.47)
num_Feebased		-2.730	11.84	6.994
		(-0.38)	(1.12)	(0.83)
adoption_length		0.334	1.189	0.135
		(0.58)	(1.35)	(0.17)
_cons	164.7	11.76	-134.7	-317.5
	(0.24)	(1.42)	(-0.71)	(-1.93)
N	16	167	23	23

Notes: Standard errors are in parentheses.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Given that inclusionary zoning programs do motivate the production of affordable housing, the second major question to address is that whether the benefits come with tradeoff. Namely, I would like to investigate if the marking price of housing increases as a result of the policy implementation. In order to control for unobserved impacts that may influence housing prices across all cities over time, I adopt a Difference-in-Difference (DID) approach to study whether having IZ in place will drive up the market

price of housing. I choose to focus on the time period between 1995 and 2005, because it is exactly the window of New Jersey Council of Affordable Housing's second round of rule. Municipalities that have adopted IZ before that window are mostly likely certified in the first round and have had the programs in place for a significant amount of time to produce measurable effects. I created a dummy variable, "before1995," to sort out my treatment and control groups. My treatment group includes municipalities that have implemented IZ programs before 1995. In order to entail a genuine discrepancy between the two groups, I set my control group to be those that did not adopt IZ programs by 2005—in that they either never adopted any or started to execute these programs some time afterwards. Then I created another dummy variable called "post" to indicate whether a housing transaction occurred before or after 1995. Finally, I created an interaction variable between "before1995" and "post."

I then used times series regression to study the effects of different determinants on the median housing price. I tested out three different scenarios. First, I incorporated only the treatment—whether a municipality has had IZ in place before 1995—and the census variables—median household income and race distribution. Second, I incorporated only the treatment and all the inclusionary housing program-related variables, such as the number of affordable units created and the number of off-site new construction programs enacted. In the third scenario, I incorporated all the variables aforementioned. The results are as below (Table 5).

My analysis has generated several interesting findings. Firstly, when I exclude the demographic variables (Column 2), I detect a statistically negative relation between the housing market price and both new affordable housing construction and rehabilitation. In other words, the increase of affordable housing stock is correlated with a price increase. The correlation can be interpreted in both ways. On the one hand, where median housing prices increase, whereas household income lags behind, the lower tier in the household income distribution would be the first to sense the housing cost pressure. Need for affordable housing will grow as a result, causing local governments to implement policies accordingly. The reasoning also corresponds to the fact that there exists a positive correlation between the number of supportive/special needs housing programs and the price of housing, since the groups that these programs intend to assist—the elderly and the disabled for instance—are also the ones who are more likely to be affected by a higher housing cost, relative to the rest of the society. On the other

hand, it is also plausible that when housing policies impose restrictions on developers, they transfer part of the burden to consumers—as argued by opponents of inclusionary zoning—by increasing the housing price. Nevertheless, it seems that it is not IZ programs that have contributed to this trend, but other inclusionary housing programs such as offsite new construction.

Secondly, as seen in Column 2 and 3, whether we incorporate the census variables or not, the presence of IZ programs is not statistically related to the housing price. In addition, there are three inclusionary housing programs whose presences are correlated with the housing price—offsite new construction, rehabilitation, and fee-based programs (e.g. in-lieu fee collection)—in that the first is positively correlated with the housing price and the latter two are negatively correlated with the price. Since these programs are not adopted randomly, we lack evidence for a causational relationship. I propose several speculations. First, where housing prices are higher on average, municipalities are more likely to introduce offsite new construction of affordable housing as an alternative to on-site, namely IZ, programs, because the on-going construction is generally more lucrative and developers do not hope to upset their potential buyers by incorporating affordable dwellings. Second, where the housing price is lower, there are more non-occupied dwellings available for rehabilitation. Meanwhile, it could also be the case that where there are more old dwellings to be renovated, housing price is also lower.

Table 5. N.J.: Determinants of Housing Prices;

Dependent Variable: log (median housing price)

Variable	***(1)***	***(2)***	***(3)***
lnincome	0.928***		0.856**
	(11.61)		(3.20)
lnWhite_alone	0.0603		0.0894
	(1.84)		(1.39)
lnBlackAA_alone	-0.0533**		-0.103*
	(-2.98)		(-2.12)
lnNative_alone	0.0129		-0.115
	(0.48)		(-1.86)
lnAsian_alone	0.00672		0.0336
	(0.33)		(0.48)
lnPI_alone	-0.0257		0.0890
	(-1.12)		(1.11)
lnOtherrace_alone	0.0746**		0.0770
	(3.15)		(0.94)
0.post	0	0	0

	(.)	(.)	(.)
1.post	0	0	0
	(.)	(.)	(.)
0.before1995	0	0	
	(.)	(.)	
1.before1995	-0.0177	0.486	0
	(-0.36)	(1.73)	(.)
0.post#before1995	0	0	
	(.)	(.)	
0.post#before1995	0	0	0
	(.)	(.)	(.)
1.post#before1995	0	0	
	(.)	(.)	
1.post#before1995	0.0235	0	0
	(0.29)	(.)	(.)
NewCompleted		-0.00420***	-0.00119
		(-6.82)	(-0.59)
RehabCompleted		-0.00782***	0.00287
		(-7.98)	(1.40)
adoption_length		-0.0211	0.0466
		(-1.58)	(1.56)
num_IZ		0.0182	-0.0190
		(1.89)	(-0.86)
num_Offsitenew		0.0406**	0.0890*
		(2.99)	(2.12)
num_Rehab		-0.217***	-0.209*
		(-5.43)	(-1.98)
num_Specneed		-0.0375***	0.0266
		(-4.99)	(1.55)
num_Feebased		0.0610	-0.537**
		(1.26)	(-2.83)
_cons	0.748	12.46***	1.872
	(0.83)	(74.08)	(0.62)
N	1951	795	273

Notes: Standard errors are in parentheses.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

6.2 North Carolina

Similarly, I also applied a Difference-in-Difference study to investigate how inclusionary zoning influences both the new construction of affordable housing and its influence on the production of affordable housing. I used the standard criteria of affordable housing—50 percent of the median household income in the area—to determine which units transferred can be designated as affordable housing units. Here I choose 2008 as the baseline year because among the counties and municipalities that have adopted IZ, approximately half did so before and half after 2008. Likewise, I also created a dummy variable "post" to indicate whether a transaction happened before or

after 2008 ("post" = "1" if yes, = "0" if not). I also generated a dummy variable "treatment" to specify whether a given municipality has implemented an IZ program before 2008. I excluded those who implemented programs just between 2008 and 2012—the final year when the housing transaction data is available—to exclude ambiguity between the control and the treatment group.

The regression results suggest that an increase in white-alone population is correlated with an increase in the affordable housing stock, whereas an increase in black-alone population is correlated with an increase in the market price of housing. Regarding the effects of inclusionary housing programs on both the affordable housing stock and housing price, the results generated correspond with my expectation. Although treatment—the adoption of inclusionary zoning programs before 2008—does imply a net increase in affordable housing stock and the market housing price, both relations are not statistically significant. Part of the reason is that most IZ programs in North Carolina are voluntary-based and there exist many methods for developers to bypass affordable housing requirements.[19] Another reason could be that vast majority of the IZ programs have not been in place for more than a decade and their impacts are still hard to detect. Finally, our analysis has not demonstrated any substantial effects of IZ probably due to the fact that the treatment group is too small.

Table 6. N.C.: Determinants of Affordable Housing Production & Housing Prices

Dependent Variables: (1) unit of affordable housing; (2) log (median housing price)

Variables	***(1) unit_AffH***	***(2) lnprice***
lnWhite_alone	35.91***	0.0349
	(3.73)	(0.08)
lnBlackAA_alone	2.838	0.236*
	(1.19)	(2.13)
lnNative_alone	-19.76**	-0.363
	(-2.93)	(-0.83)
lnAsian_alone	-7.347	0.118
	(-1.48)	(0.48)
lnPI_alone	-11.42**	0.0357
	(-3.19)	(0.21)
lnOtherrace_alone	10.15**	-0.175
	(2.95)	(-1.10)

[19] See this news piece for instance. https://indyweek.com/news/eight-years-ago-chapel-hill-enacted-progressive-affordable-housing-policy-triangle.-failed./

adoption_length	0	0
	(.)	(.)
0.post	0	0
	(.)	(.)
1.post	0	0
	(.)	(.)
0.treatment	0	0
	(.)	(.)
1.treatment	22.14*	0.485
	(2.50)	(1.14)
0.post#0.t~t	0	0
	(.)	(.)
0.post#1.t~t	0	0
	(.)	(.)
1.post#0.t~t	0	0
	(.)	(.)
1.post#1.t~t	0	0
	(.)	(.)
lnincome		0.283
		(0.39)
_cons	-281.0***	7.202
	(-4.17)	(0.93)
N	95	95

Notes: Standard errors are in parentheses.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Discussion and Reflection

A potential shortcoming of the study is it does not take into consideration the impacts a municipality's policy-implementation may generate upon nearby communities, especially their housing markets. According to the dataset of New Jersey's inclusionary housing programs, there were 156 municipalities—a little more than a quarter of all—that had launched inclusionary housing programs by 1995. It is likely that the regulations they put forth would cause developers to relocate to nearby municipalities to avoid the restrictions. I argue that programs in one community will not entail a substantial impact on adjacent areas for two reasons, although the reasons themselves could distort the data in other ways. First, New Jersey's 1985 Fair Housing Act established a constitutional obligation for each municipality to ensure a fair share of affordable housing for low- and moderate-income families. Since this Act applies equally to all local communities, even if they do not voluntarily enter the Council on

Affordable Housing process, they have to devise other mechanisms to meet the goal, which sometimes involve restrictions on developers as well.

Another potential source of bias is that since municipalities in both New Jersey and North Carolina choose on their own what programs to adopt to mitigate the shortage of affordable housing. In other words, IZ-implementation is not a randomly assigned variable and it is hard to decide whether its correlation with both the affordable housing production and the market housing price is in fact a causal relation. In addition, there might be a strong correlation between demographic features of an area and its IZ implementation. For instance, the latter might be correlated with the median household income, resulting in a collinearity between variables in the analysis.

Nevertheless, the results of my analysis partly verified the hypothesis that inclusionary zoning does not necessarily induce market failure. In states such as North Carolina, where the state legislature is not particularly incentivized to prompt IZ programs, local IZ is usually voluntary. Since developers would enter into the program only if they expect to receive a higher return—their gain from density bonuses, for example, may produce more profits via market-rate housing. In New Jersey, where the state is more active in motivating local governments to take action to address the undersupply of affordable housing, the programs are more likely to mandatory. Nevertheless, we do not detect a statistically positive relationship between IZ programs and housing prices, either. This lack of evidence could potentially suggest IZ itself does not create inefficiency and the market was not originally efficient. Even so, due to the absence of an indicator of the restrictive level (i.e. whether the program is mandatory or not, how much minimum percentage of affordable housing construction it requires, etc.), I am not able to test out my speculation any further.

North Carolina's side of the story is less intricate but equally valuable. Although several municipalities have successfully implemented IZ programs, they are not very likely to be mandatory. Evidence suggests that developers who willingly participate are still very few in numbers. Although we do not witness a surge in price due to the programs, these IZ programs are not functioning as well as expected either. Essentially, whether or not to adopt IZ could be a potential tradeoff and municipalities have to constantly weigh their gains against loss. More importantly, they have to pay close attention to their local situations so as to tailor the programs accordingly. After all, one thing is for sure—IZ is not a policy whose one size fits all.

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