Urban Economics

Lecture 5: Urban Planning and Land-Use Controls - continued

Spring 2024
Tuukka Saarimaa

Outline

In this lecture, we will analyze urban planning from an economic point of view

- The focus will be on the incentives of different actors in the urban development process and whether we should regulate their actions

Present a conceptual framework for estimating costs and benefits of regulation

Present empirical results on the effects of upzoning on construction and the effects of local politics on land use decisions

The lecture does not follow the textbook

In what situations should we regulate the actions of market participants?

Do I have too few or too many socks?

Do I have too few or too many socks?

Answer: I have exactly the right number of socks!

How do I know?

Because I alone get the benefits and I alone bear the costs

There is no reason to think that anybody would know better

Do we have too little or too much pollution?

Do we have too little or too much pollution?

Answer: we can be pretty sure that we have too much pollution

How do we know?

Because a polluter does not bear the full costs of his/her activity

Pollution externality or spillover

Do we have too few or too many cars in downtown Helsinki at 4pm on a Friday?

Do we have too few or too many cars in downtown Helsinki at 4pm on a Friday?

Answer: we can be pretty sure that we have too many cars

How do we know?

Because drivers do not bear the full cost when they enter downtown

Congestion and pollution externalities or spillovers

Are we going to have too few or too many housing units in Jätkäsaari?

Are we going to have too few or too many housing units in Jätkäsaari?

Answer: I'm not sure

We would probably have too many without urban planning

Housing would be plentiful and cheap, but

- Profit-maximizing developers would not internalize negative externalities
- No one would leave their lot unbuilt to provide green spaces or consider blocked views, congestion etc.

Are we going to have too few or too many housing units in Jätkäsaari?

But are we going to get too few because regulations are too tight?

More generally

If we want to know whether we have too much or too little of something, we need to look at the incentives faced by the relevant decision-makers

- Do they feel all the costs of their activity or do some costs spillover to others?
- Do they feel all the benefits of their activity or do some benefits spillover to others?

What are the incentives faced by developers?

	Private	Spillover
Benefit		
Cost		

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Benefit	The revenue from selling the building or renting out the units	
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Cost	The construction costs of the building and land acquisition	Blocked views, less open space, congestion, fiscal burdens, CO_2

What are the incentives faced by developers?

	Private	Spillover
Benefit	The revenue from selling the building or renting out the units	More people to meet, more services in the n'hood, fiscal benefits
Cost	The construction costs of the building and land acquisition	Blocked views, less open space, congestion, fiscal burdens, CO_2

Regulation

Housing development/construction and city-life more generally is riddled with market failures

- E.g. externalities or spillovers from new development
- Incentives to provide green spaces within cities

There is need for urban planning and regulation. But have we gone too far?

- If we constrain development too much, we get high housing costs, small housing units, long commutes and sprawl

Let's think about this from an economics point of view

Why is Manhattan so expensive?

WHY IS MANHATTAN SO EXPENSIVE? REGULATION AND THE RISE IN HOUSING PRICES*

EDWARD L. GLAESER,
Harvard University

JOSEPH GYOURKO,
University of Pennsylvania

and

RAVEN SAKS
Harvard University

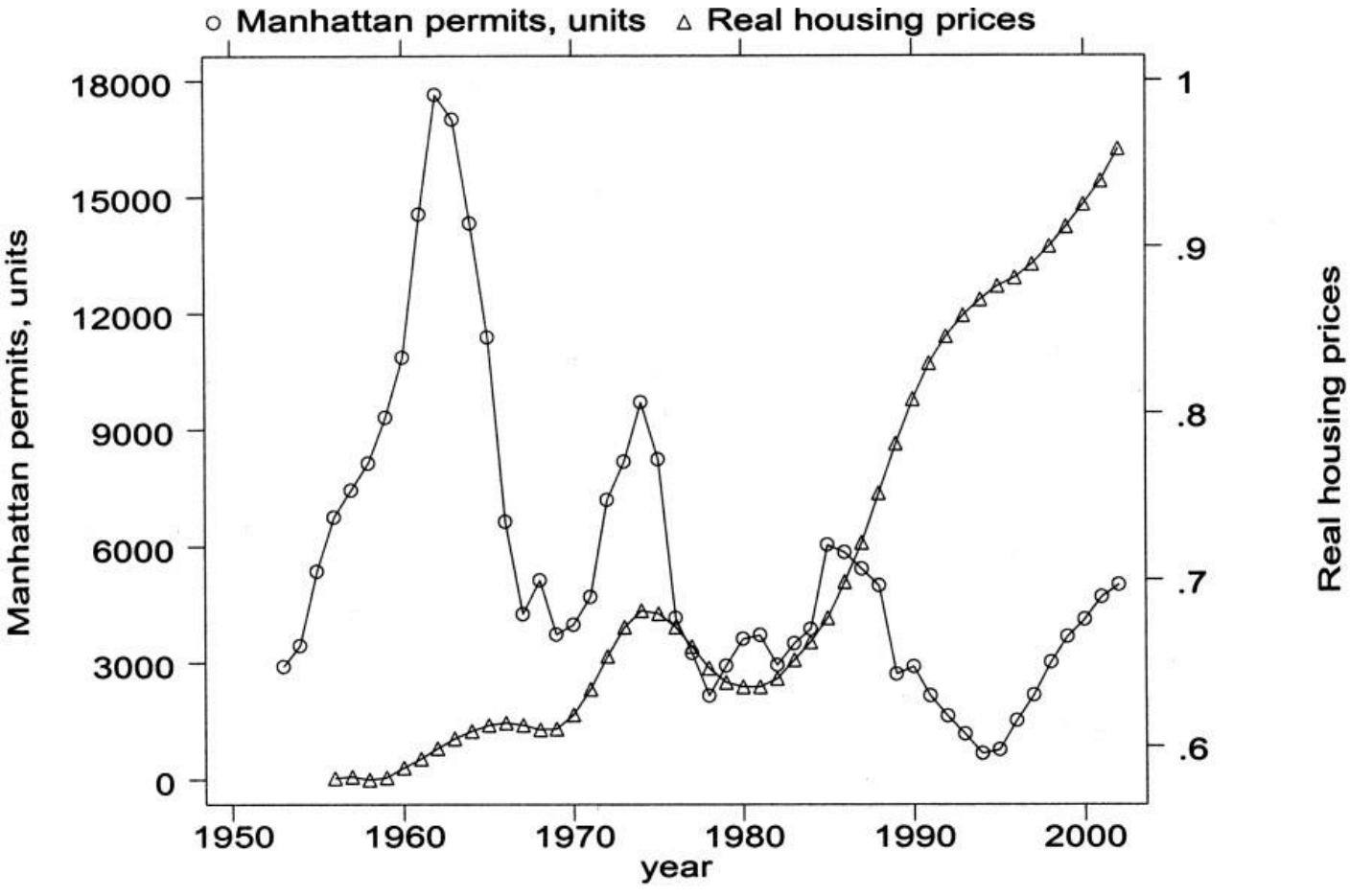
Abstract

In Manhattan, housing prices have soared since the 1990s. Although rising incomes, lower interest rates, and other factors can explain the demand side of this increase, some sluggishness in the supply of apartment buildings is needed to account for high and rising prices. In a market dominated by high-rises, the marginal cost of supplying more housing is the cost of adding an extra floor to any new building. Home building is a highly competitive industry with almost no natural barriers to entry, and yet prices in Manhattan currently appear to be more than twice their supply costs. We argue that land use restrictions are the natural explanation for this gap. We also present evidence that regulation is constraining the supply of housing in a number of other housing markets across the country. In these areas, increases in demand have led not to more housing units but to higher prices.

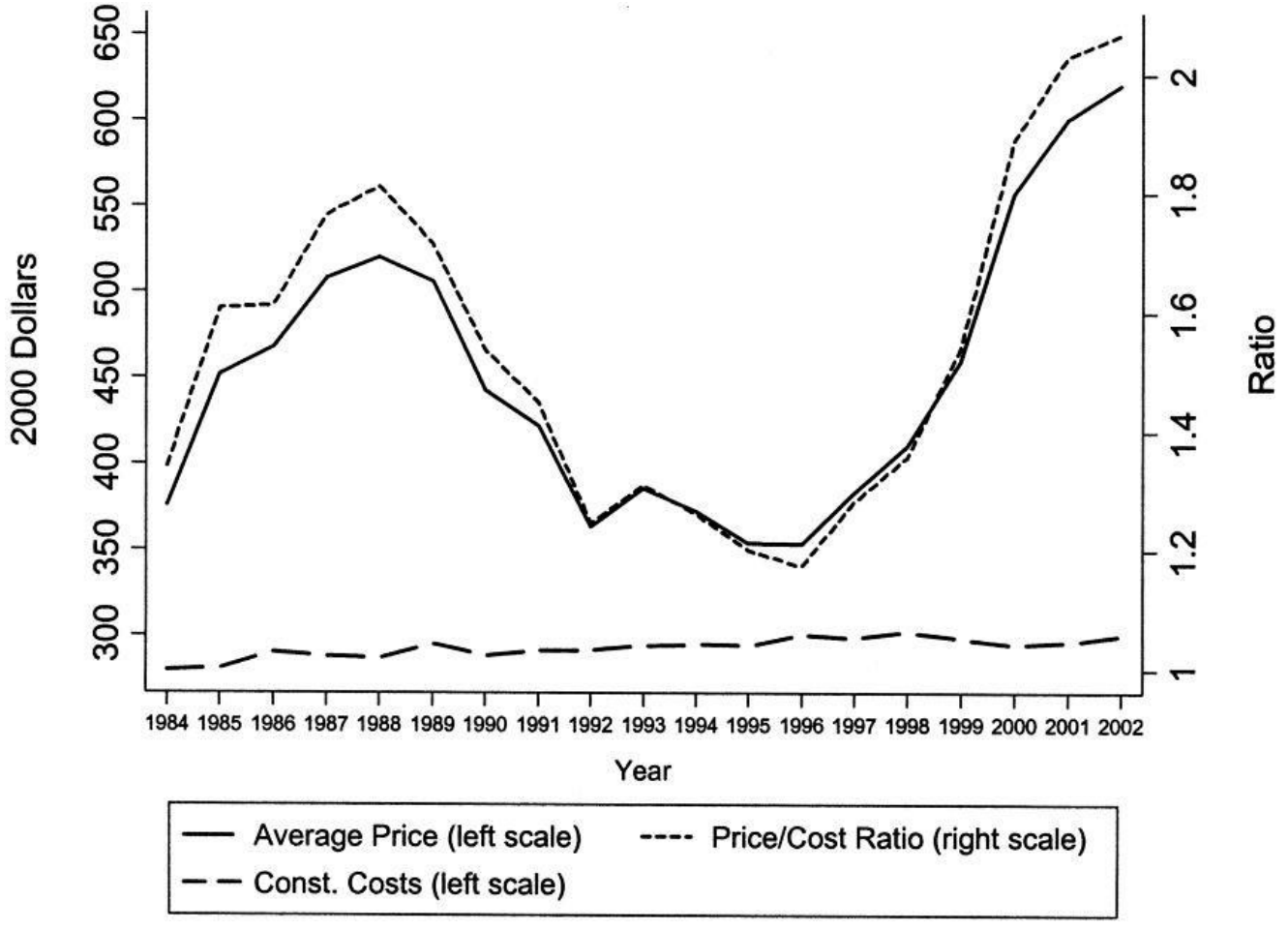
The Journal of Law and Economics
Volume 48, Number 2
October 2005

https://www.journals.uchicago.edu/doi/10.1086/429979

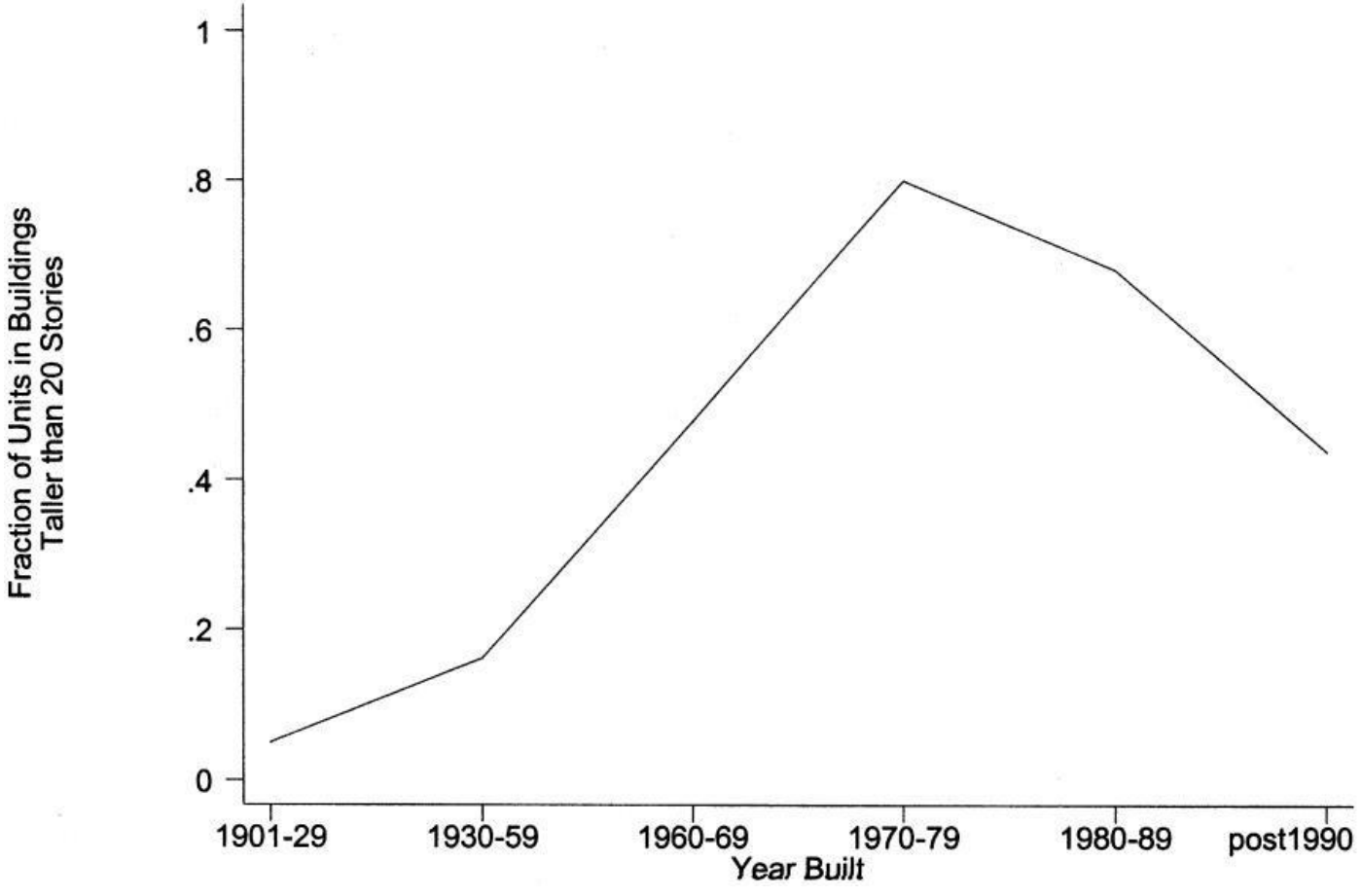
Background


Manhattan permits, units
Real housing prices
18000
15000
12000
9000
6000
3000
0
1
.9
.8
.7
.6
1950
1960
1970
1980
1990
2000
year
Manhattan permits, units
Real housing prices

Background


2000 Dollars
300
350
400
450
500
550
600
650
Ratio
1
1.2
1.4
1.6
1.8
2
1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002
Year
Average Price (left scale)
Price/Cost Ratio (right scale)
Const. Costs (left scale)

Background


Fraction of Units in Buildings Taller than 20 Stories
1
.8
.6
.4
.2
0
1901-29
1930-59
1960-69
1970-79
1980-89
post1990
Year Built

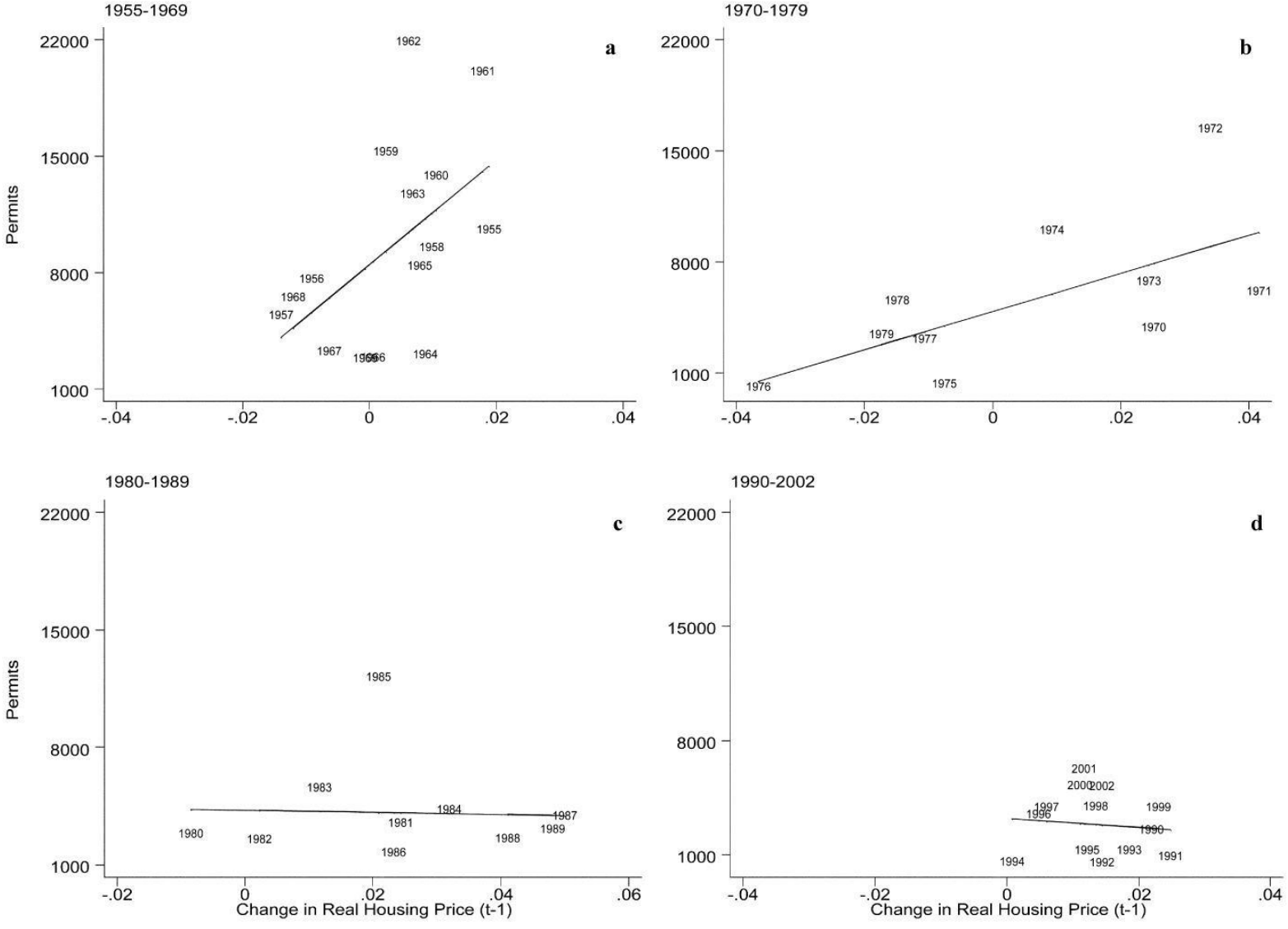


Figure 4.— Manhattan permits and changes in (lagged) housing prices, by decade

The paper

Empirical strategy is to measure the gap between housing prices and the costs of producing the marginal apartment

- Use this difference to measure regulatory distortions in the housing market

Why?

- In the absence of government regulation, standard economic theory predicts that buildings will be sufficiently large so that price will equal marginal cost
- If government regulation limits building heights (or housing supply more generally), prices will be above marginal costs

Regulatory tax

Regulatory tax = market price of a housing unit – marginal cost of that unit

If this is positive and large, something is preventing additional housing construction

- It would be profitable to build more
- This gap could, in principle, arise from monopoly power in the construction industry, but Glaeser et al. reject this explanation due to very high number of construction firms in NY area

TABLE 1

DISTRIBUTION OF PRICE PER SQUARE FOOT FOR CONDOMINIUMS (in 2002 Dollars)

	N	Mean ($)	25th Percentile ($)	Median ($)	75th Percentile ($)
Manhattan[a]	23,060	468	339	455	572
Manhattan[b]	156	500	271	461	664
Other boroughs[b]	165	149	89	120	177
By unit size:[a]					
<600 square feet	5,460	434	311	432	534
600–<800 square feet	6,722	445	339	439	542
800–<1200 square feet	6,729	472	346	460	580
1200 square feet	4,149	542	378	519	680
By building height:[a]					
<10 stories	3,686	377	252	365	474
10–19 stories	5,760	400	269	385	500
20–29 stories	3,199	497	396	482	577
30–39 stories	5,227	498	384	489	589
≥40 stories	4,788	573	438	543	678

TABLE 2

DISTRIBUTION OF MANHATTAN CONDOMINIUM PRICE PER SQUARE FOOT, BY GEOGRAPHIC AREA (in 2002 Dollars)

	N	Mean ($)	25th Percentile ($)	Median ($)	75th Percentile ($)	Average Height[a]
Manhattan	23,060	468	339	455	572	27
By neighborhood:						
Greenwich Village/ Financial District	2,703	416	309	405	501	16
Lower East Side/ Chinatown	711	373	240	378	474	7
Chelsea/Clinton/ Midtown	4,086	515	355	490	648	34
Stuyvesant Town/ Turtle Bay	6,534	436	330	443	539	31
Upper West Side	3,913	494	361	476	592	24
Upper East Side	4,759	509	372	490	611	29
Morningside Heights/Hamilton Heights	18	162	130	141	190	5
Harlem	131	277	191	245	371	6
Washington Heights/ Inwood	128	169	91	162	210	6

SOURCE.—Condominium sales records, First American Real Estate Corporation, 1984–2002 (data on file with the authors). All nominal values are converted to real 2002 dollars using the Consumer Price Index.

[a] Average number of stories.

TABLE 3

CONSTRUCTION COSTS (in 2002 Dollars)

	Average Cost per Square Foot ($) (1)	Marginal Cost per Square Foot (2)
R. S. Means: apartments in New York City:[a]		
8–24 story	249	273
4–7 story	225	
1–3 story	221	
Marshall & Swift: 25-story apartments in Manhattan:[b]		
High-quality luxury	353	373
Average-quality luxury	257	272
Good-quality	204	216
Average-quality	163	172
NYU Center for Real Estate and Urban Policy:[c]		
15-story luxury high-rise	301	362
6-story midrise	209	
AHS condos in apartment buildings[d]		
Chicago	144	N.A.
<10 stories	148	N.A.
United States excluding N.Y. MSA	129	N.A.
<10 stories	176	N.A.

NOTE.—Price is the reported market value of owner-occupied units from R. S. Means, Square Foot Costs (2002). All values are converted to 2002 dollars using the Consumer Price Index. NYU = New York University. MSA = metropolitan statistical area.

[a] Marginal cost is calculated assuming a quadratic cost function passing through the points (2,221), (5,225), and (15, 249). The reported value is the marginal cost of adding a 24th story.

[b] Costs per square foot are from the Marshall & Swift, Commercial Cost Estimator (Web site data accessed in 2002). Average costs per square foot are the average of reported values for building classes A, B, C, and D in November 2002. Marginal costs are reported for the 25th floor and are calculated from the statement that each floor above 3 stories adds an additional .5 percent to the average cost.

[c] Average cost estimates are from Zaxon, Inc., and were converted to real 2002 dollars using the Consumer Price Index. Marginal cost is calculated at the 15th story from the difference between costs of a 6-story and 15-story building.

[d] U.S. Census Bureau, American Housing Survey (http://www.census.gov/hhes/www/housing/ahs/metropolitandata.html).

Regulatory tax

“Taken together, the construction cost data strongly suggest that something near $275 per square foot is a reliable upper bound on the cost of building up for the vast majority of Manhattan apartments.”

“Even so, to be conservative in our computation of the regulatory tax, we will use a figure of $300 per square foot.”

“For a majority of Manhattan condominium owners, these data suggest that some form of regulatory constraint means that their cost of housing now is at least 50 percent more than it would be under a free-development policy.”

Can Manhattan's regulatory tax be justified?

Existence of this regulatory tax is not necessarily inefficient

- If there are negative externalities from building too much or too tall buildings, the regulatory tax is a "Pigouvian tax" that forces developers to internalize the social costs of their actions

Are there likely to be negative externalities large enough to warrant a regulatory tax of the magnitude found in the paper?

- While welfare analyses of zoning are inherently difficult to perform, Manhattan provides perhaps the best possible laboratory
- Adding a large number of housing units, and therefore a large number of people, would not change the basic character of the place
- Even so, the results are most properly viewed as educated guesses and not precise estimates

At least three things to consider

1. **Regulatory tax should reflect the fact that a new apartment may eliminate views from existing apartments**
   - Indeed, most current height restrictions in Manhattan exist for exactly that reason
2. **New development should be taxed to the extent there are negative externalities created by extra crowding**
3. **The tax should reflect the fiscal burden of the new resident on current residents**

Conclusions: Glaeser et al. (2005)

Analysis suggests that negative externalities are not large enough to justify the current gap between prices and production costs of condominiums in Manhattan

Moreover, it is possible that a thorough analysis of the impact on transportation might even justify subsidizing denser construction in Manhattan

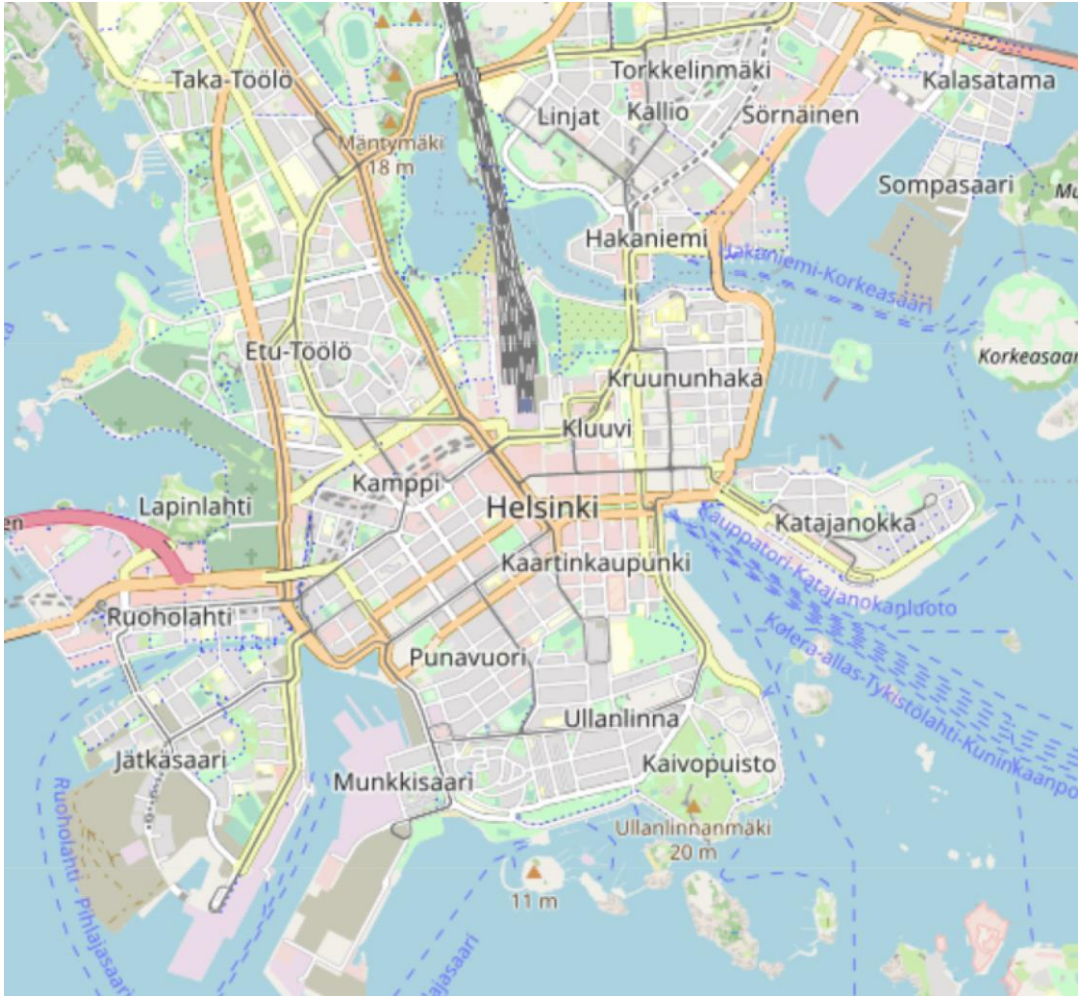
Also, we have been very conservative in not adjusting market values for depreciation, it is hard to escape the conclusion that regulatory constraints on building in Manhattan are far too restrictive

Regulatory tax in Jätkäsaari

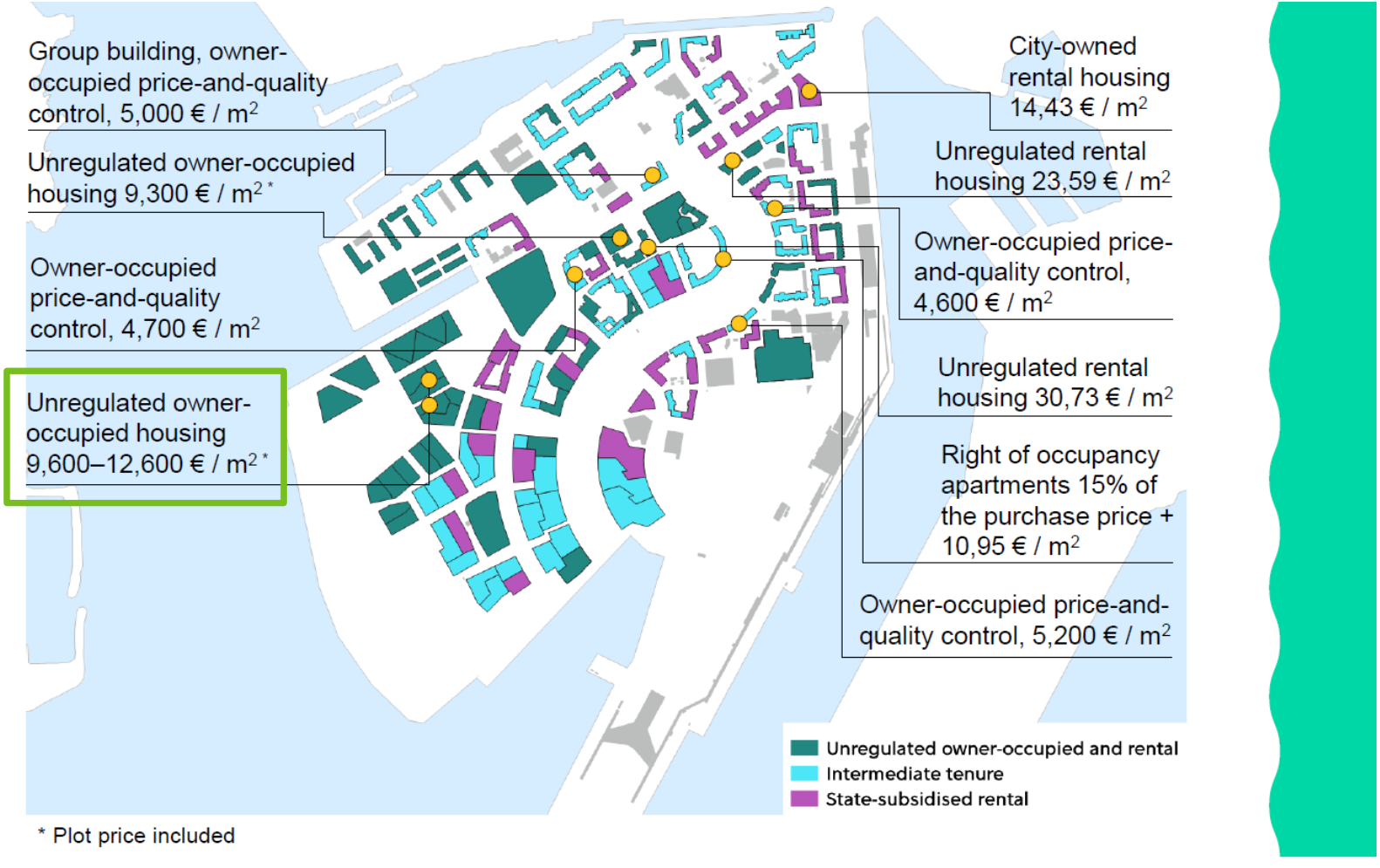
Jätkäsaari

In 2030, Jätkäsaari will have about 21,000 inhabitants

The average building height will be roughly 8 floors



Jätkäsaari prices



* Plot price included

Source: Helsinki

Regulatory tax in Jätkäsaari

Regulatory tax related to building one additional floor to Jätkäsaari buildings?

- One additional floor would allow roughly 2600 additional residents (21,000/8 ≈ 2600)
- The price per square meter is roughly €9000 and the private construction cost €3000(?) per square meter
- Each additional square meter of housing space leads to a private benefit of €6000 (9000–3000)
- If all the additional residents would each consume 30 m², private benefits would add up to €468 million (2600*30*6000)

For the current plan to be optimal, there must be spillover costs or negative externalities that exceed this €468 million

Regulatory tax in Jätkäsaari

Price (€/m^2)	Construction cost (€/m^2)	Regulatory tax (€)
9000	3000	468M
9000	4000	390M
9000	5000	312M
9000	6000	234M
9000	7000	156M
9000	8000	78M

Case Auckland – does upzoning increase construction?

ELSEVIER

Journal of Urban Economics

Volume 136, July 2023, 103555

The impact of upzoning on housing construction in Auckland ☆

Ryan Greenaway-McGrevy [a], Peter C.B. Phillips [a b c d]

https://www.sciencedirect.com/science/article/pii/S0094119023000244

Auckland Unitary Plan

Reform

- Prior to 2010, the metropolitan region comprised seven different city and district councils
- Since 2010, the entire metropolitan area, as well as several towns, has been under the jurisdiction of a single local government
- Led to unified land use policy "Auckland Unitary Plan" in Nov 2016

Research design

- AUP as a quasi-experiment in which residential areas that were upzoned to either MHS, MHU or THA are designated as treatment areas, while residential areas that were not upzoned (including SH) are control areas

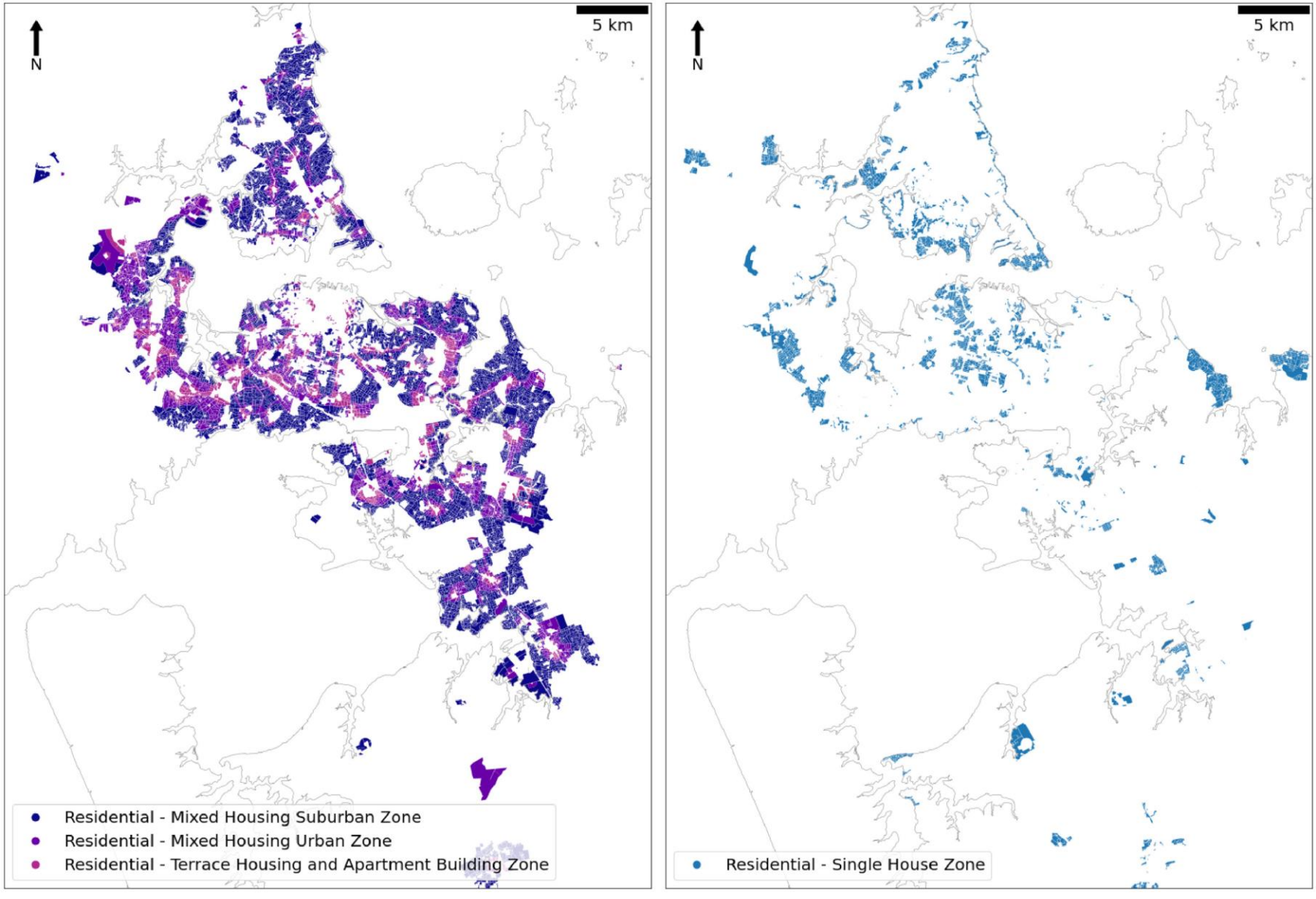
Data

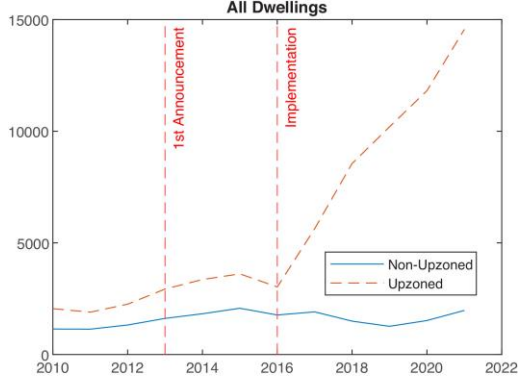
- Annual building permits for new dwelling units issued by the Auckland Council from 2010 to 2021

Approximately three-quarters of all residential land (SH, MHS, MHU and THA zones combined) is classified as upzoned

Table 1. Summary of land use regulations by residential zone under the Auckland unitary plan.

Regulation	Terrace housing and apartments zone	Mixed housing urban zone	Mixed housing suburban zone	Single house zone
Max. height	16m (five to seven storeys)	11 to 12m (three storeys)	8 to 9m (two storeys)	8 to 9m (two storeys)
Height in relation to boundary	3m vertical + 45° recession plane	3m vertical + 45° recession plane	2.5m vertical + 45° recession plane	2.5m vertical + 45° recession plane
Setback	0m	1m	1m	1m
Site Coverage	50%	45%	40%	35%
Impervious Area	70%	60%	60%	60%
Min. dwelling size (1 bedroom)	45m^2	45m^2	45m^2	n/a
Max. dwellings (on existing parcels)	does not apply	3	3	1
Min. Lot Size (subdivision)	1200m^2	300m^2	400m^2	600m^2


N
5 km
Residential - Mixed Housing Suburban Zone
Residential - Mixed Housing Urban Zone
Residential - Terrace Housing and Apartment Building Zone
N
5 km
Residential - Single House Zone


All Dwellings
1st Announcement
Implementation
Non-Upzoned
Upzoned
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10000
5000
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2010
2012
2014
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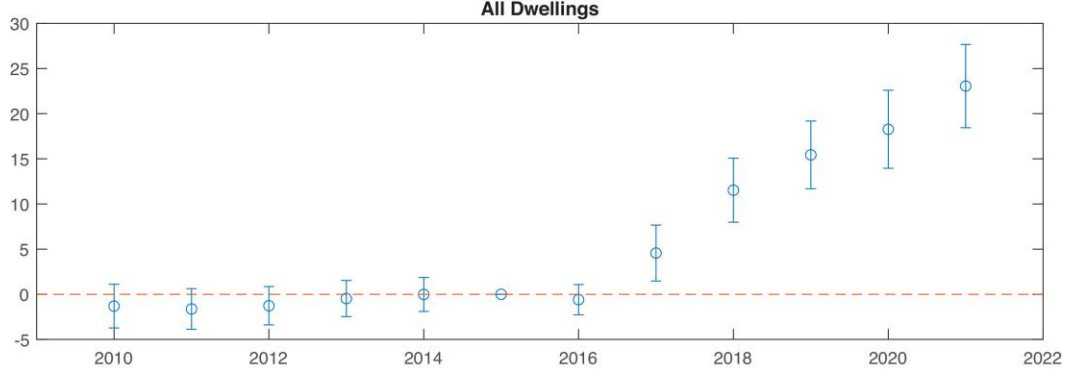
2020
2022


All Dwellings
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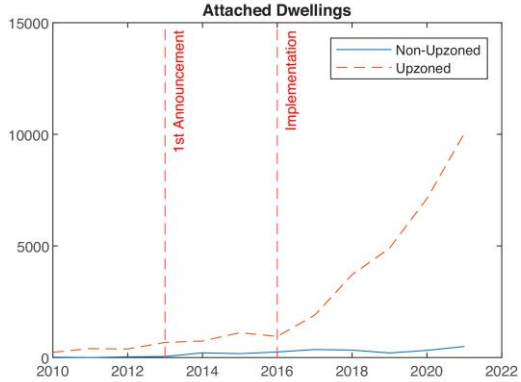
Attached Dwellings
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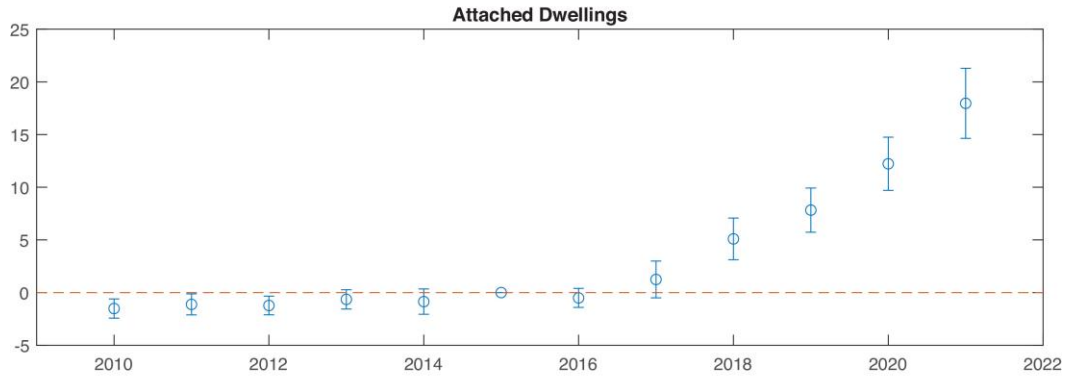
Attached Dwellings
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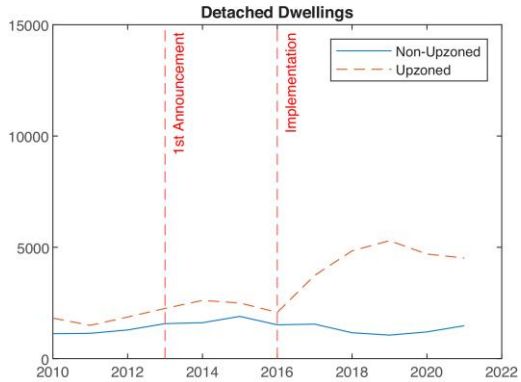
Detached Dwellings
1st Announcement
Implementation
Non-Upzoned
Upzoned
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2010
2012
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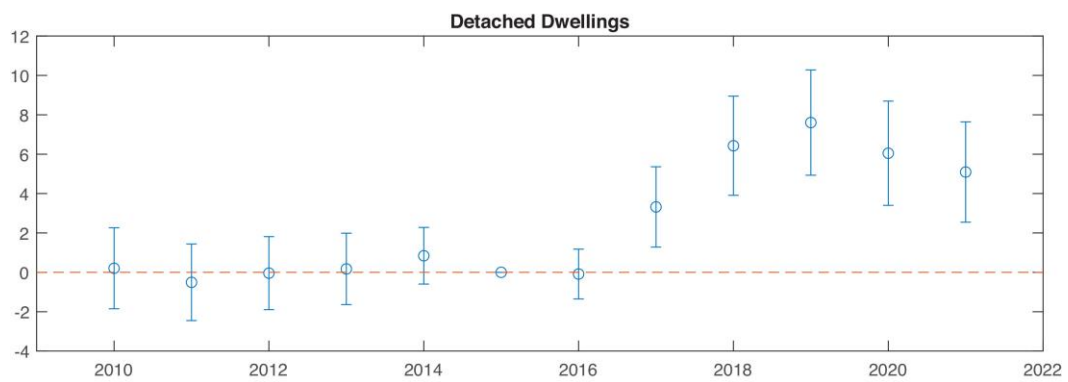
2022


Detached Dwellings
12
10
8
6
4
2
0
-2
-4
2010
2012
2014
2016
2018
2020
2022

Conclusions

The empirical findings show strong evidence to support the conclusion that upzoning raised dwelling construction in the city of Auckland

- Much of this increase is in the form of the more capital intensive, attached (or multifamily) structures in the inner suburbs of the city
- Permits for attached dwellings are still trending upwards and permits for detached dwellings remain significantly above their pre-upzoning average

Future research: price effects

Local politics

Incentives of local politicians

Land use policy is decided by current residents of the municipality through local democracy

- Current residents can vote in local elections (insiders)
- People living in other municipalities (outsiders) do not have a democratic channel to affect land use policy and housing supply

The goals of the current residents may conflict with the goals of future residents (or wannabe residents)

- Not-in-my-backyard (NIMBY): less housing supply than would be optimal if we also consider outsiders' welfare

Let's see whether housing construction (and public services) are related to neighborhood representation

Mast (2022)

Exploits an electoral reform—changing from "at-large" to "ward"or "district" elections for town council

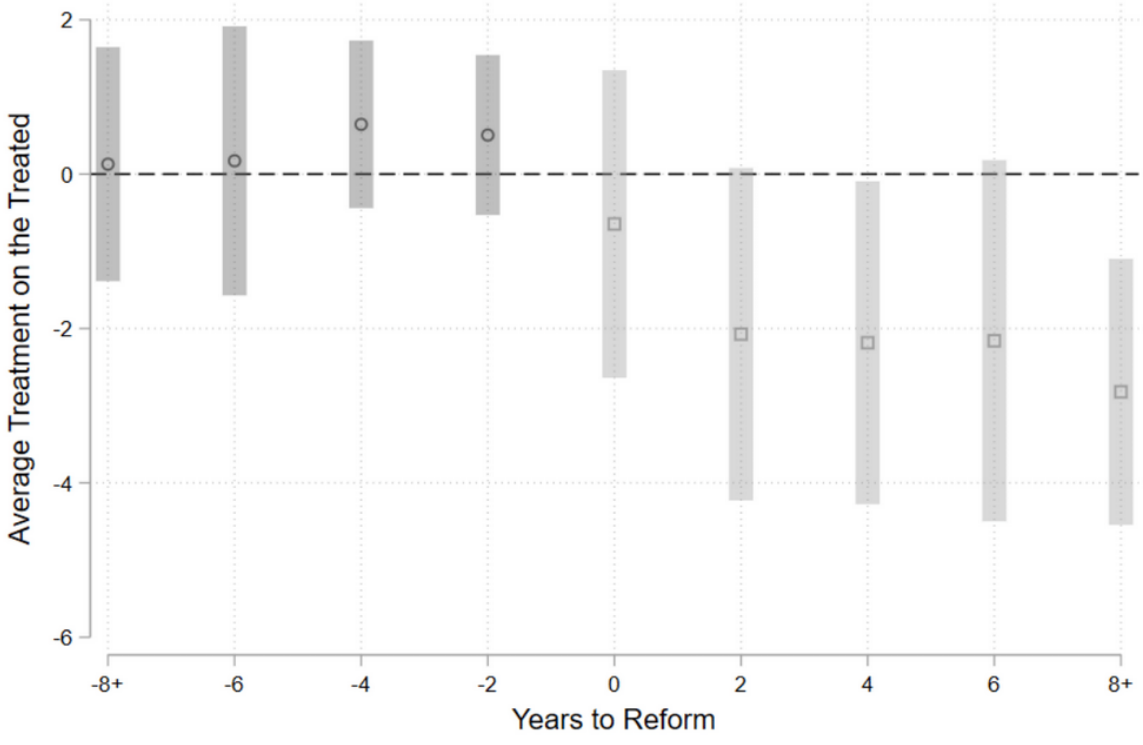
- These reforms shrink each representative's constituency from the entire town to one ward within the town
- Reform happened due to worries of minority representation under at-large elections

DID estimates show

- That this decreases housing units permitted by 24 percent, with 47 percent and 12 percent effects on multi- and single-family units
- The effect on multifamily is larger in high-homeownership towns

https://direct.mit.edu/rest/article/doi/10.1162/rest_a_01192/111189/Warding-Off-Development-Local-Control-Housing

Figure 2: CS Event Study for Total Units Permitted



Note: This figure shows treatment effects in two-year bins of event time from the Callaway and Sant'Anna (2020) estimator. The y-axis represents the average treatment effect on the treated. Year 0 is the two-year period in which a town approved a switch from at-large to ward elections, and the dependent variable is units permitted divided by 1980 population (in 1000s). The specification includes controls for a town's state and 1980 levels of population, income, owner-occupancy, and percent white. Errors are clustered at the state level, and bars represent 95% uniform confidence bands. The comparison group is never treated towns, and the sample is the matched sample described in Section 3.1.

Folke, Marten, Rickne & Dahlberg (2021)

Swedish context

- PR system with closed lists and preferential votes
- Data on politician's micro-locations; elections results and geocoded data on buildings permits (and schools)
- Compares with different degrees of political power (ruling majority or opposition) and where power was won in a close election (narrow vote margin)

Find negative effects on approved building permits for multifamily homes (and proposals to close schools)

- In neighborhoods in which more politicians from the local majority party vs. the local opposition live

https://drive.google.com/file/d/1E_zWLKvfUYxisvJnhjlW7VBGHcEkQDOv/view

Harjunen, Saarimaa & Tukiainen (2023)

Looks at neighborhood representation and school closures

Finnish context

- PR system with open lists
- Data on politician's micro-locations; elections results and geocoded data on schools

https://www.journals.uchicago.edu/doi/10.1086/723983

Harjunen, Saarimaa & Tukiainen (2023)

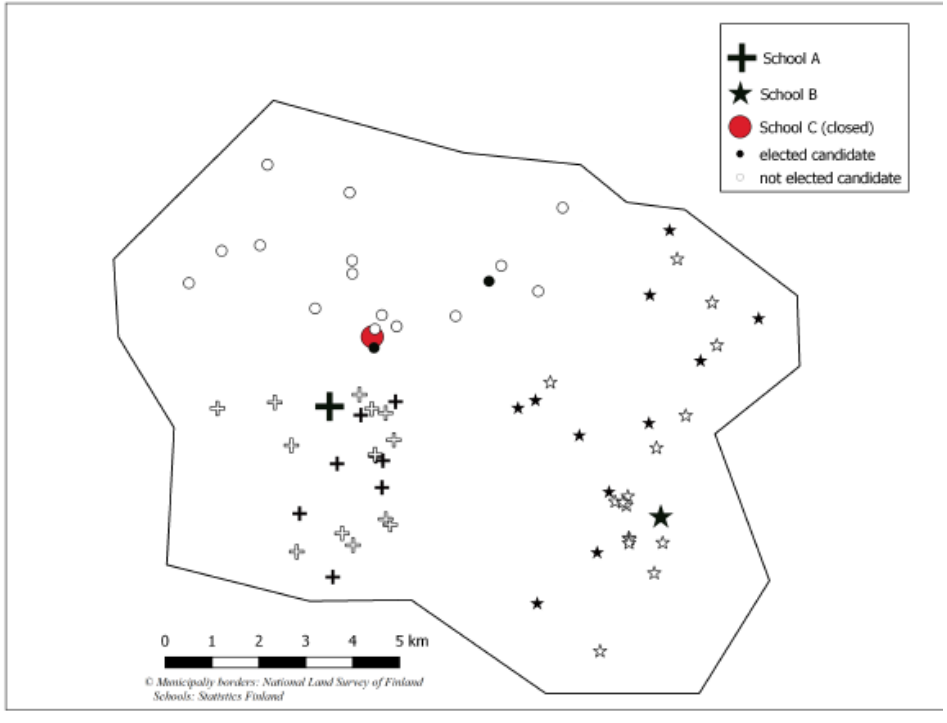


Figure A2: Assigning candidates to schools.

Table 3: Effect of representation on school closure.

Panel A: Lottery	(1)	(2)	(3)	(4)
Constant	0.204***	0.282***	0.329***	0.305***
	(0.030)	(0.038)	(0.100)	(0.099)
Elected	-0.108***	-0.101***	-0.099***	-0.097***
	(0.035)	(0.035)	(0.035)	(0.035)
N	419	419	419	419
R-squared	0.023	0.064	0.096	0.108
Panel B: One vote margin	(5)	(6)	(7)	(8)
Constant	0.186***	0.260***	0.207***	0.213***
	(0.016)	(0.022)	(0.053)	(0.054)
Elected	-0.062***	-0.061***	-0.065***	-0.064***
	(0.020)	(0.020)	(0.020)	(0.020)
N	1540	1540	1540	1540
R-squared	0.007	0.045	0.063	0.064
P-value for effect difference	0.122	0.172	0.247	0.258
School controls	No	Yes	Yes	Yes
Candidate controls	No	No	Yes	Yes
Election term FE	No	No	No	Yes

Recap

Housing development and city-life more generally is riddled with market failures

- E.g. externalities/spillovers from new development
- There is need for urban planning and regulation
- However, regulation is often implemented at the local level by insiders => may lead to suboptimal decisions and restricted supply

We have just scratched the surface

- A framework for thinking about benefits and costs
- How to reliably quantify the foregone benefits due to regulation and the relevant spillovers?
- How to design mechanisms that would internalize the spillovers so that decision-makers would take them into account?