Urban Economics

Lecture 9: Economics and Urban Planning

Spring 2023
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

- **We also present conceptual framework for estimating costs and benefits of regulation**

- **Present an empirical results on the effects of constructing market-rate housing**

- **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 zoning and planning

- Profit-maximizing developers would not internalize negative externalities

- No one would leave their lot unbuilt to provide green spaces etc.

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

But are we going to get too few because the planner is too strict?

By planner, I mean the political process that has led to the Jätkäsaari plan

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?

13

What are the incentives faced by developers?

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Benefit		
Cost		

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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

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,
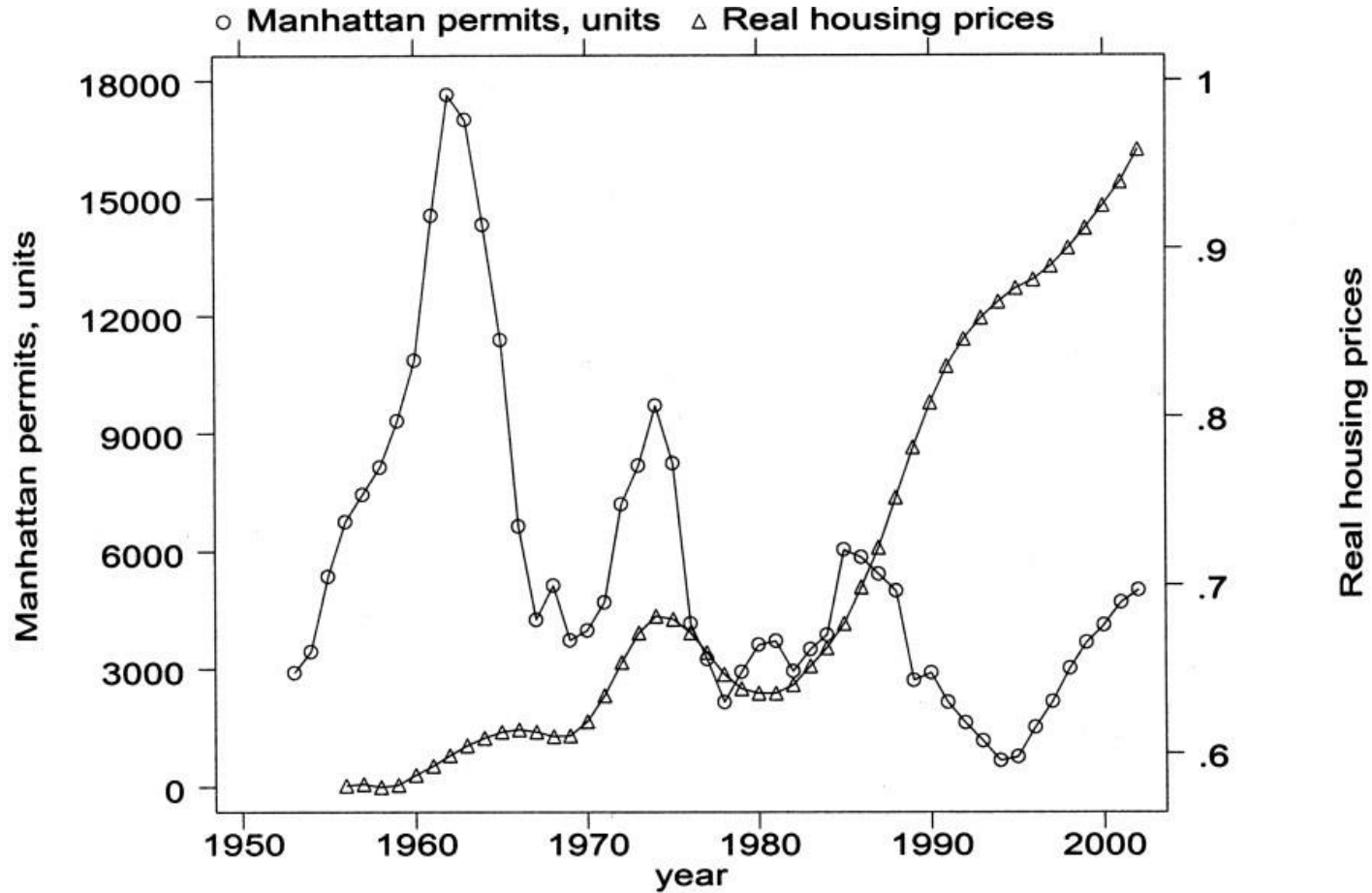University of Pennsylvania

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.
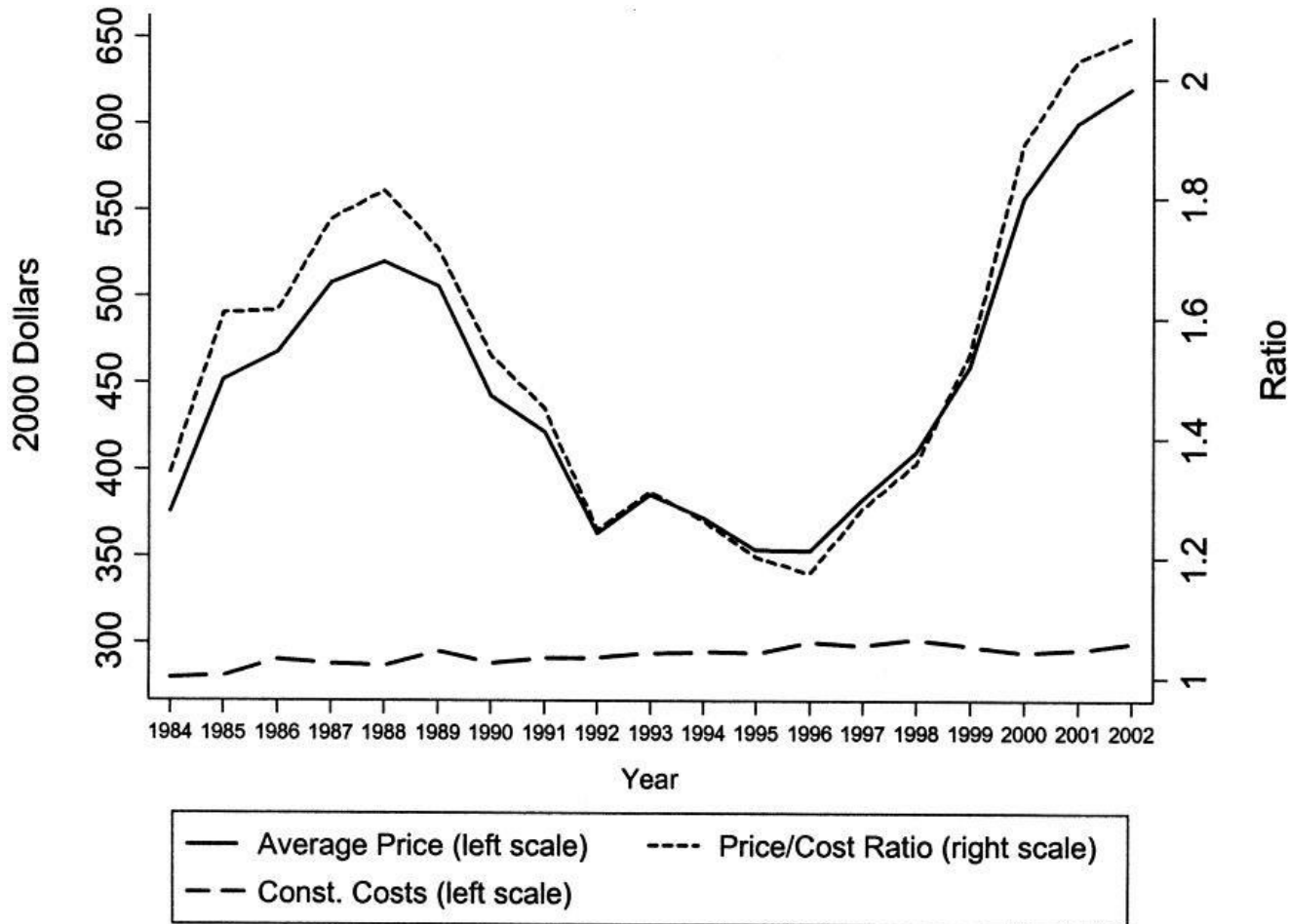
Background

Background

Average Price (left scale) · · · · Price/Cost Ratio (right scale)
– – Const. Costs (left scale)
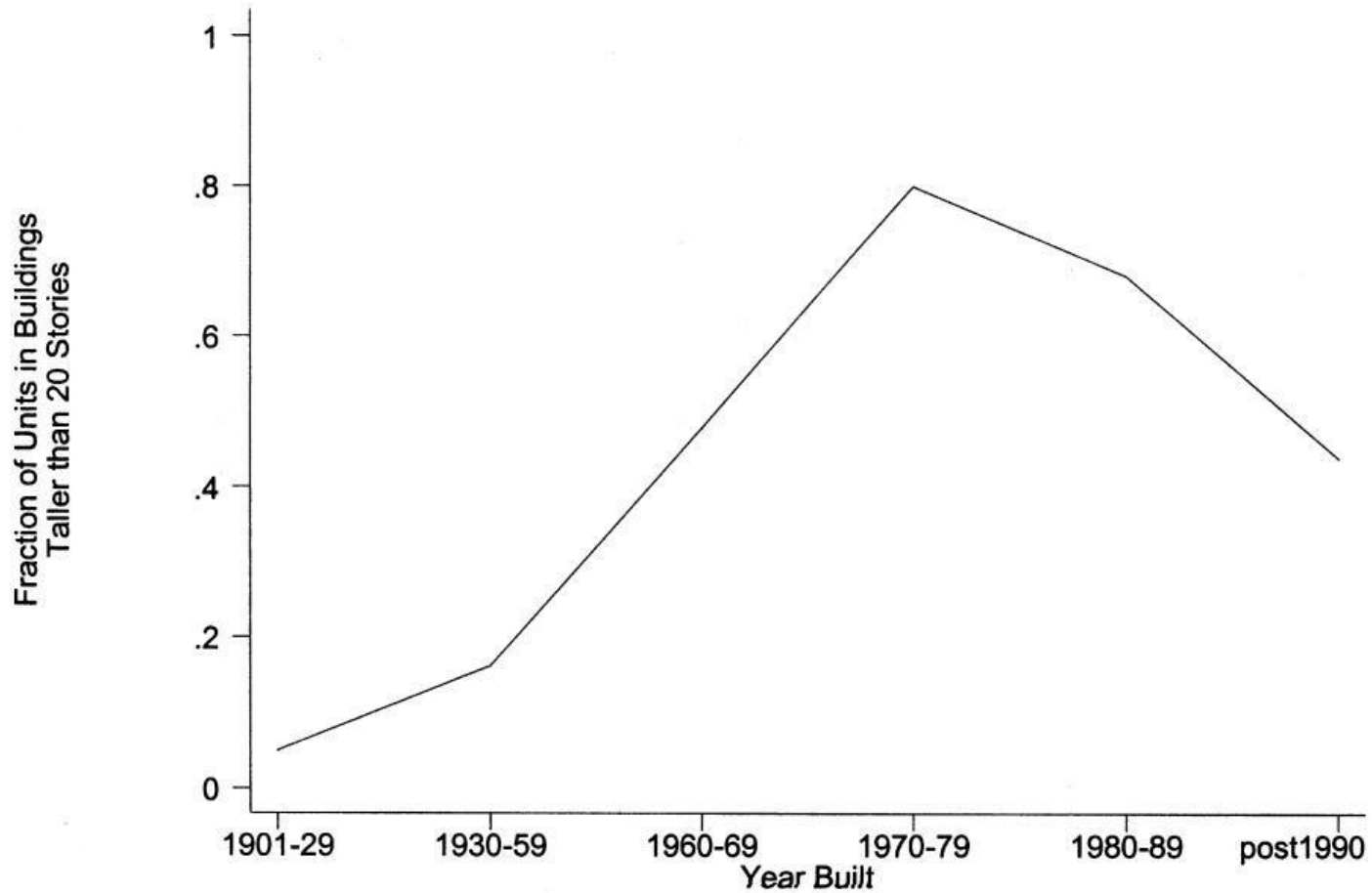
Background

The paper

- **Empirical strategy is to measure the gap between real estate 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 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

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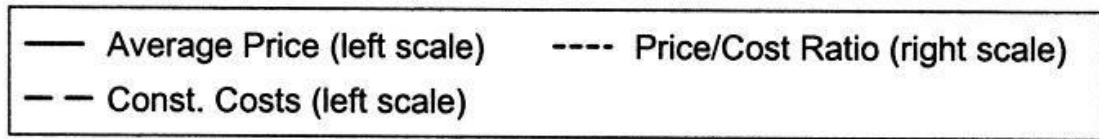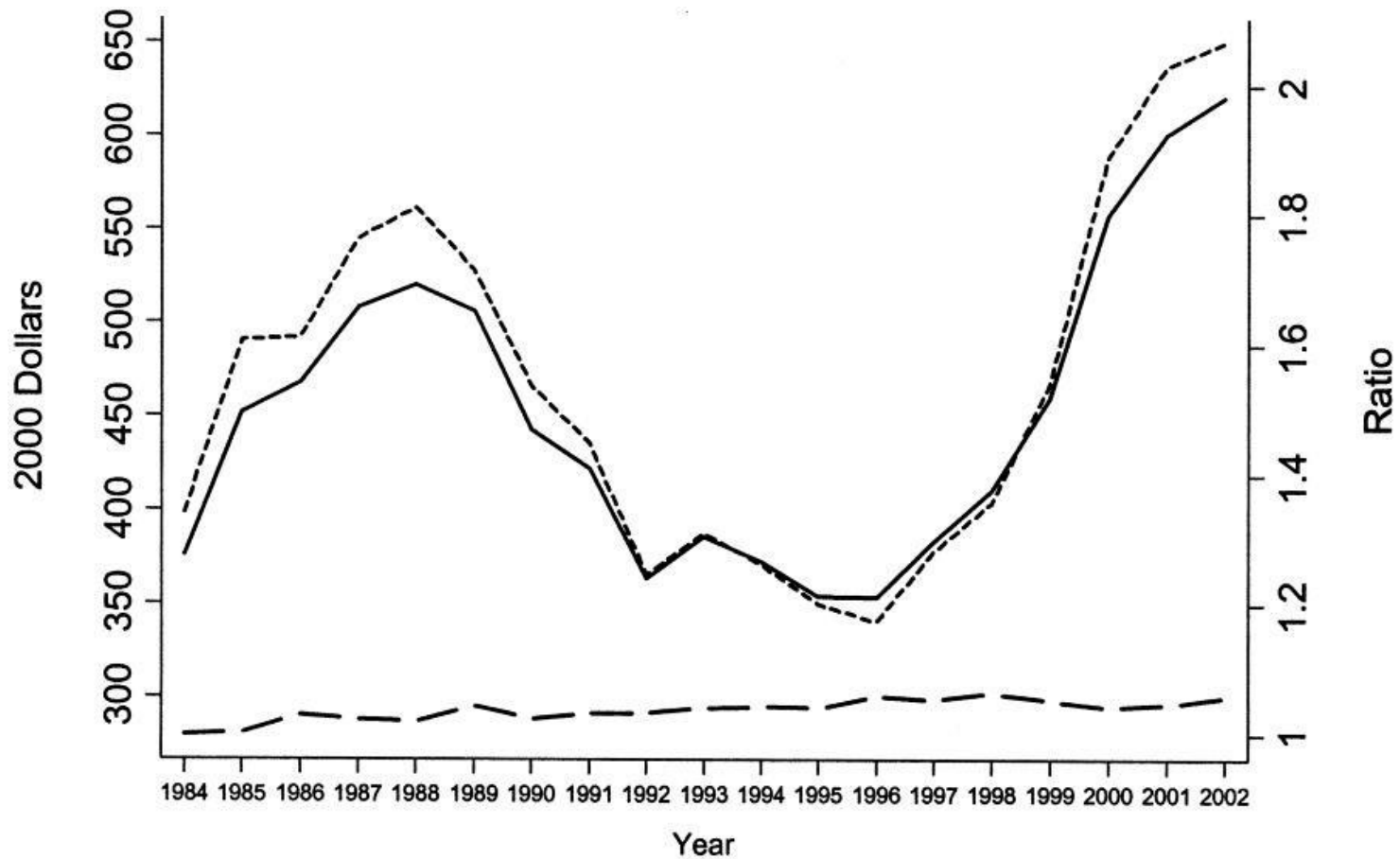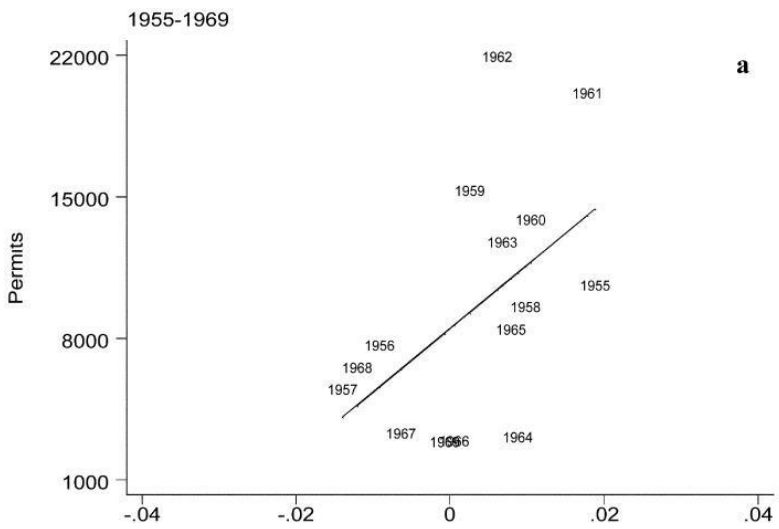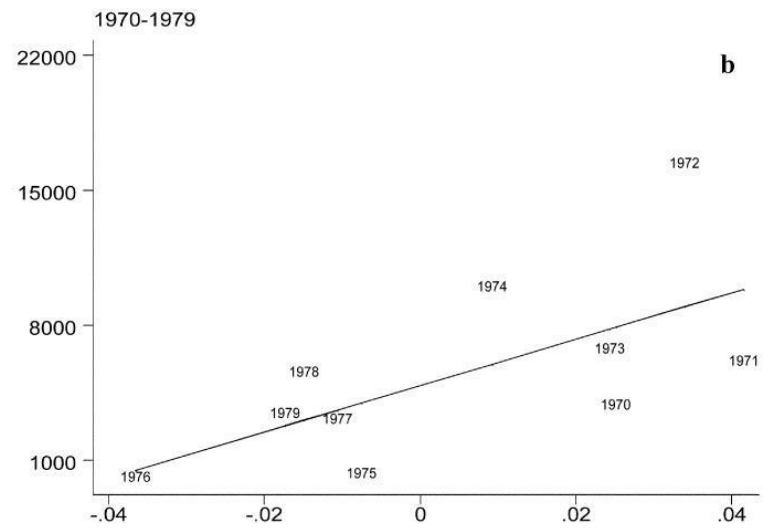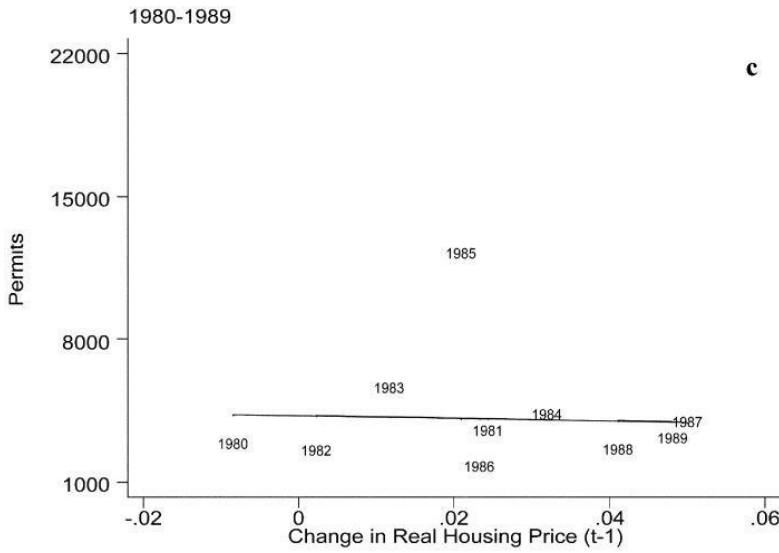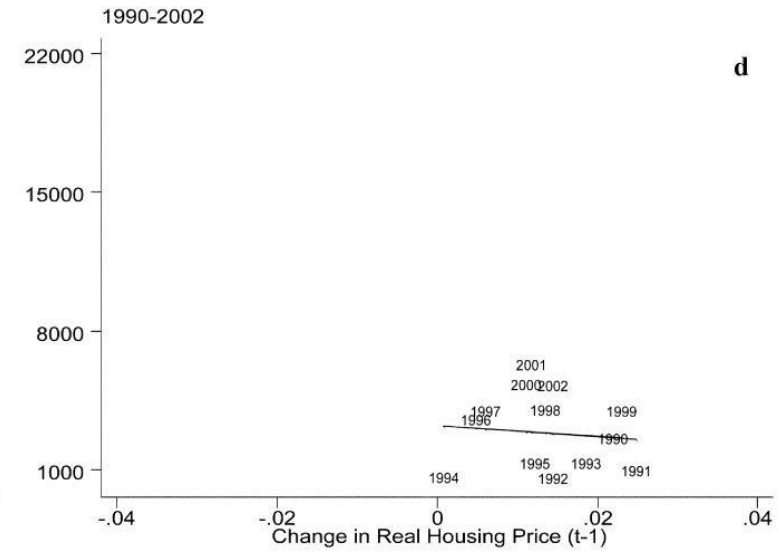
Figure 4.— Manhattan permits and changes in (lagged) housing prices, by decade

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 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 nature of the place

  - Even so, our results are most properly viewed as educated guesses and not precise estimates

At least three things to consider

1. **Zoning 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**

Estimating the value of views

- **Estimate the price premium of upper floor units compared to lower floor units of the same building:**

$$\log(\text{Price}) = \underset{(.006)}{.08} \times I_{11-20} + \underset{(.009)}{.16} \times I_{21-30} + \boxed{\underset{(.01)}{.23} \times I_{31+}} \qquad (2)$$
$$+ \underset{(.008)}{1.00} \times \log(\text{Square Footage}).$$

- The difference in value between being very high up in a building and being on the first 10 floors is about 25 percent of unit price

Regulatory tax for protecting views

- **Assume that one unit blocks the view for 0.5 unit**

  - Since the loss of one complete view would reduce the value of the apartment by 25 percent, each extra dollar of tall building will lead to about 12.5 cents of lost view

  - As such, this analysis suggests that apartments should face a construction-related regulatory tax equal to approximately 12.5 percent of their value

Congestion costs

- **Very difficult to estimate**

  - Gross vs. net congestion? Are there costs or benefits?

- **"Guesstimate" from this regression:**

$$\log(\text{Median Rent}) = 3.4 + 1.04 \times \log(\text{Per Capita Income})$$
$$(.64) \quad (.06)$$

$$- .05 \times \log(\text{City Population}). \quad (3)$$
$$(.016)$$

- **A 1 percent increase in population "causes" a .05 percent decrease in rents**

- **An extra percent of population in NY should cause the value of all homes to drop by one-twentieth of 1 percent**

  - Therefore, there should be an additional 5 percent regulatory tax on new apartments owing to these congestion externalities

Fiscal burden

- **There are good reasons to believe that new residents in Manhattan condominiums would represent a considerable fiscal transfer to, not from, the city**
  - These would be rich people with small number of children
  - Rich people enroll their kids into private schools while paying taxes for public schools
  - Many government expenditures entail large fixed costs. For these expenditures, new population is an unqualified improvement since it allows those expenditures to be spread over a larger base
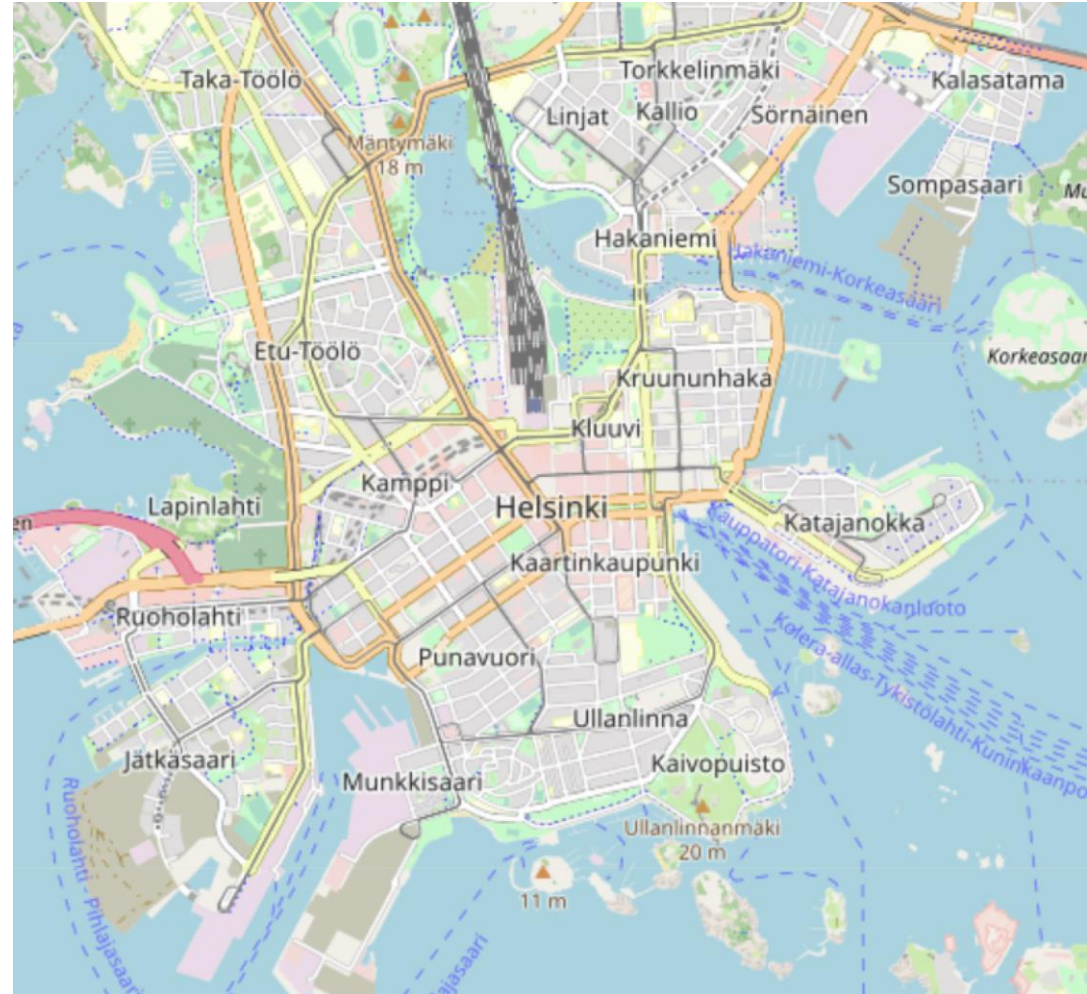
Conclusions: Glaeser et al. (2005)

- **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**
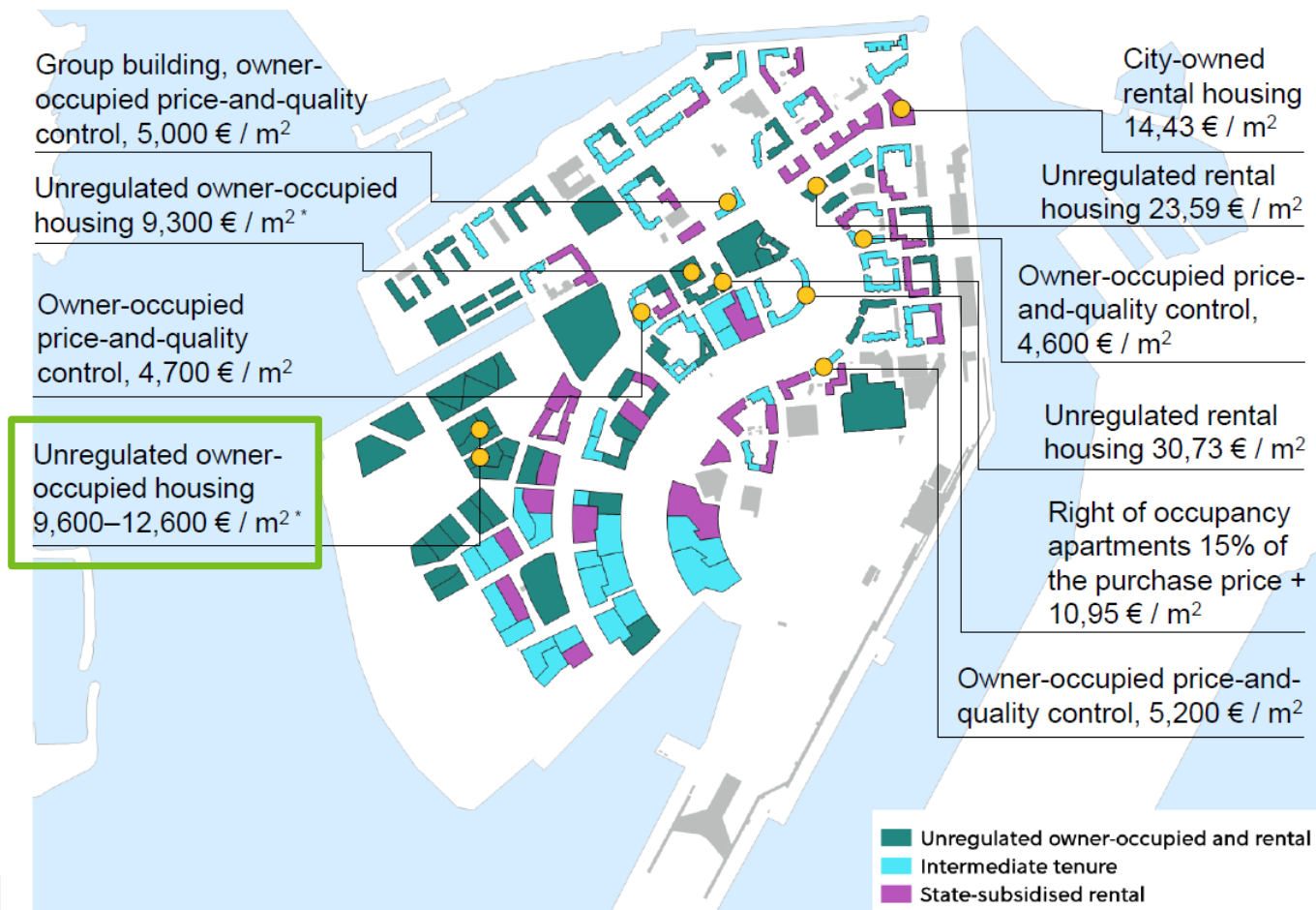
Regulatory tax in Jätkäsaari

Jätkäsaari

- In 2030, Jätkäsaari is going to have about 21,000 inhabitants

- The average building height will be roughly 8 floors

- Is this just the right amount, too few or too many?

Jätkäsaari prices

Group building, owner-occupied price-and-quality control, 5,000 € / m²

Unregulated owner-occupied housing 9,300 € / m² *

Owner-occupied price-and-quality control, 4,700 € / m²

Unregulated owner-occupied housing 9,600–12,600 € / m² *

City-owned rental housing 14,43 € / m²

Unregulated rental housing 23,59 € / m²

Owner-occupied price-and-quality control, 4,600 € / m²

Unregulated rental housing 30,73 € / m²

Right of occupancy apartments 15% of the purchase price + 10,95 € / m²

Owner-occupied price-and-quality control, 5,200 € / m²

Unregulated owner-occupied and rental
Intermediate tenure
State-subsidised rental

Source: Helsinki

* Plot price included

Regulatory tax in Jätkäsaari

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

  - One additional floor would allow roughly 2600 additional residents ($21,000/8 \approx 2600$)

  - 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

Effects of new market-rate housing supply

Background

- **Housing costs are high and have risen rapidly in many major cities around the world**

- **Increasing supply by relaxing land-use regulation especially in central and expensive parts of cities is frequently proposed as a solution to rising housing costs**

- **Counterargument:**
  - Constructing market-rate housing in high-demand locations only benefit the rich because these units will be expensive
  - We should build new housing in places where new units would be cheap

But don't we already know the answer?
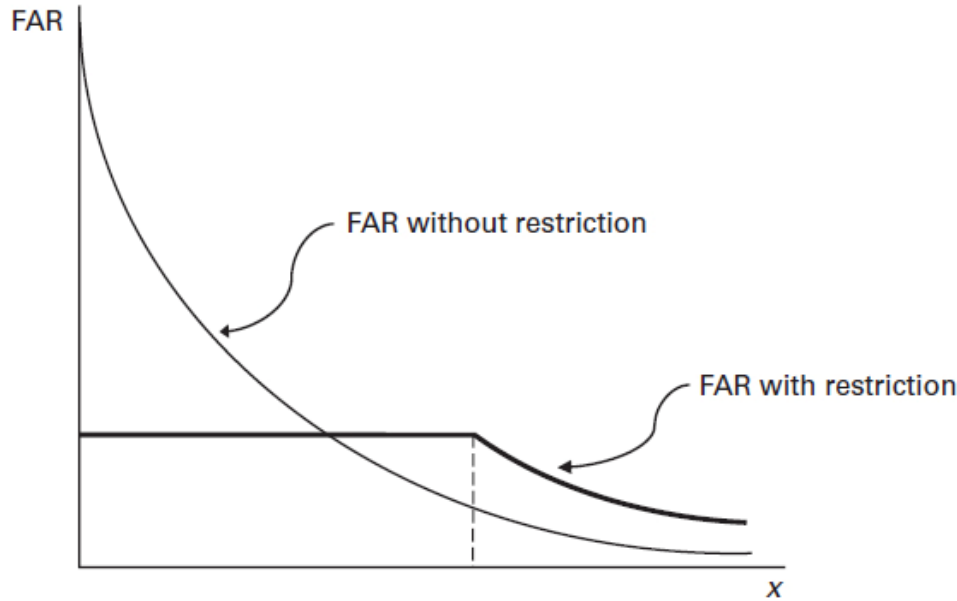
Figure 4.3
Effect of building-height restrictions.

The FAR restriction increases the price per square meter of housing in all locations

There are fewer dwellings in central parts of the city, and they become relatively more scarce

Some households need to find housing somewhere else, which increases the demand for housing increasing prices there as well

Higher prices lead consumers to reduce dwelling sizes

Not necessarily

- **The effect is obvious in a simple model of homogenous housing units, but housing is highly differentiated**

  - New construction is predominately expensive and quite different from units that are affordable to lower-income households

  - If the housing market is highly segmented, with few households searching or moving across dissimilar housing types, an increase in the supply of expensive new units could have little effect on the market for lower-income housing

- **The strength of this relationship is crucial to policymakers considering reforms that increase market-rate construction**

  - Need to weigh benefits against costs, such as objections from neighbors, concerns of gentrification etc.

# JUE insight: City-wide effects of new housing supply: Evidence from moving chains ☆

Cristina Bratu [a] ✉, Oskari Harjunen [b] ✉, Tuukka Saarimaa [c] ✉

Bratu et al. (2023)

- **Study moving chains initiated by buildings built between 2010 and 2019 within a 3km radius of Helsinki Central Station**

- **Use geo-coded register data containing information on all residents in Finland over the 2009-2019 time period**
  - The data includes rich demographic and socio-economic characteristics: gender, income, education and number of children
  - Can link individuals to both their home buildings and the housing units at the end of each calendar year

- **Granular location information**
  - If there are at least three households in the building, know the exact coordinates of the building
  - Otherwise, the coordinates refer to 250 square meter grids

■	(5452,8712]
■	(4063,5452]
■	(3402,4063]
■	(3054,3402]
■	[2067,3054]
□	No data
○	New buildings
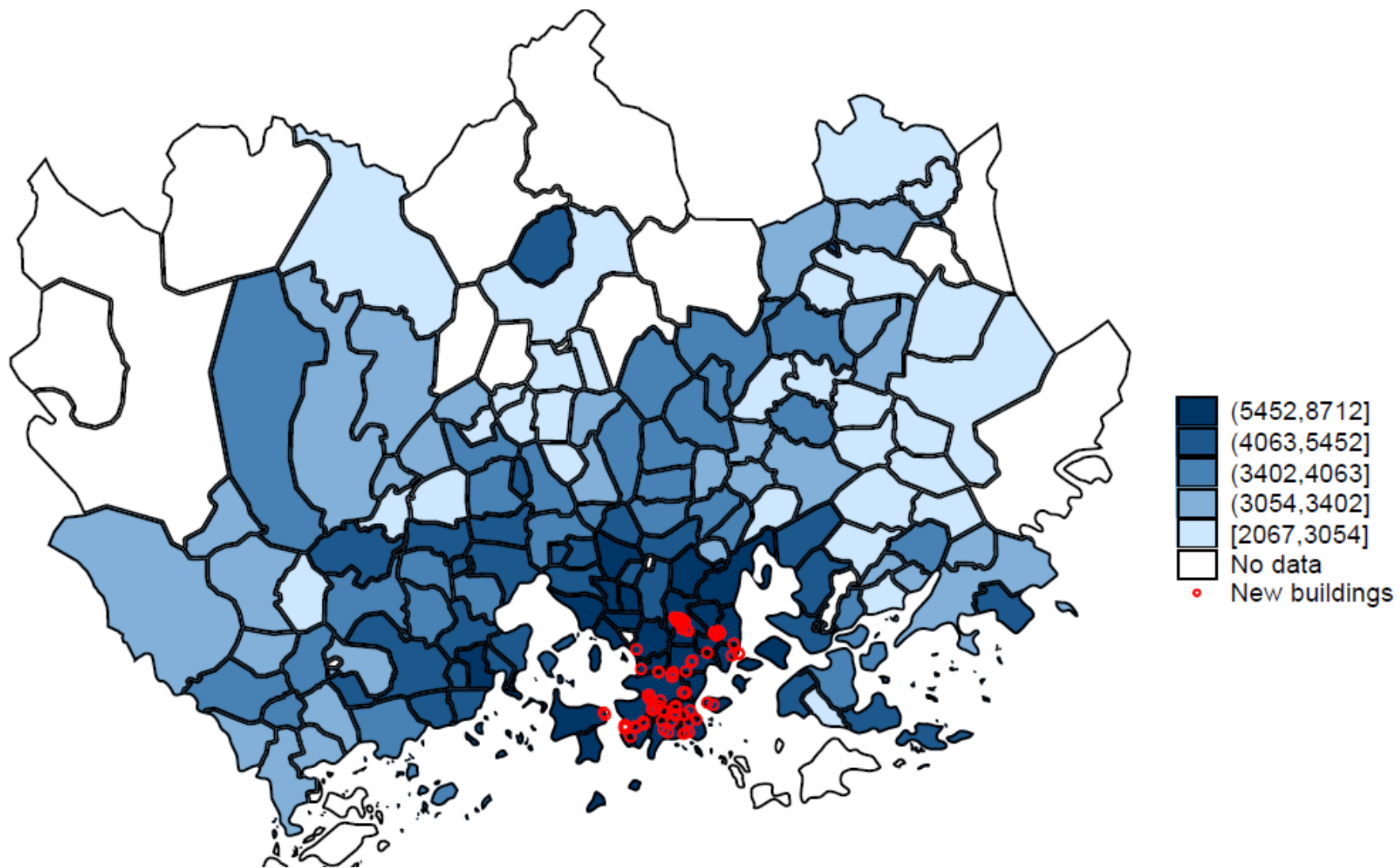
# New housing units trigger a chain of moves
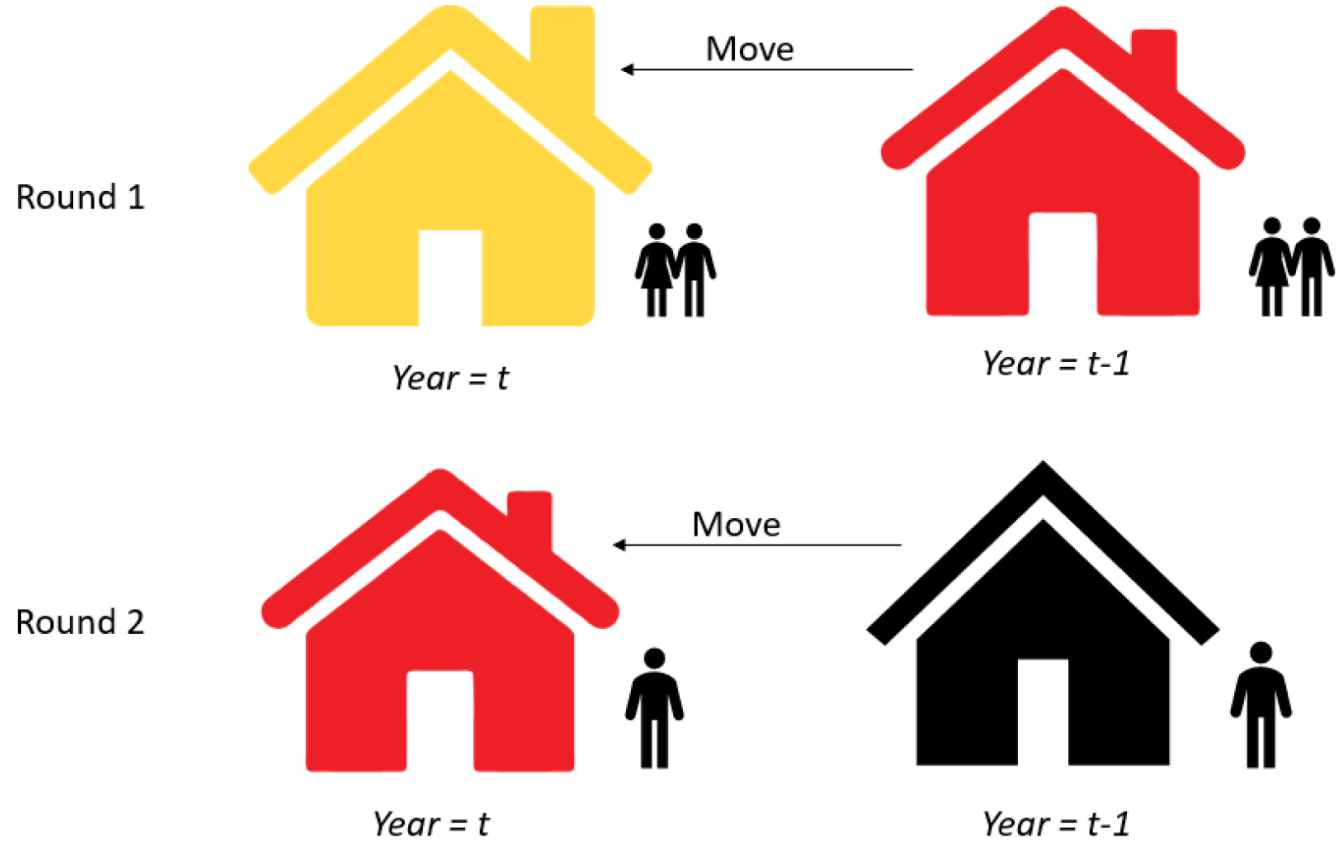
Movers to new buildings

Table 1

Summary statistics for movers and stayers in free-market buildings.

	Stayers	All movers	Movers to new buildings
Age household head	56.247	36.914	40.697
	[14.910]	[13.216]	[13.895]
Median household disposable income	27,616.865	24,216.484	33,906.445
	[60,730.066]	[55,910.324]	[57,765.914]
Master's degree or higher in household	0.329	0.279	0.458
Household with children	0.429	0.396	0.307
Origin single-family home	0.352	0.170	0.116
Origin owned home	0.904	0.448	0.514
Number of observations	3,730,715	1,134,761	5400

Notes: Stayers are defined as those that never move over the 2009–2019 time period. All movers exclude round 1 movers to new buildings within 3 km of the CBD. Standard deviations are reported in square brackets.
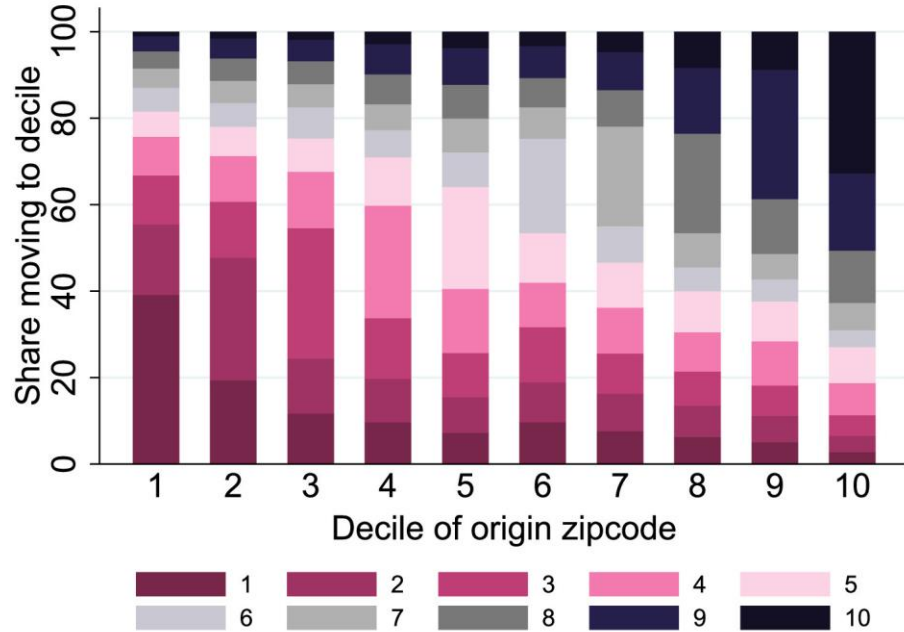
Figure 3: Share of movers originating from the HMA at each round.
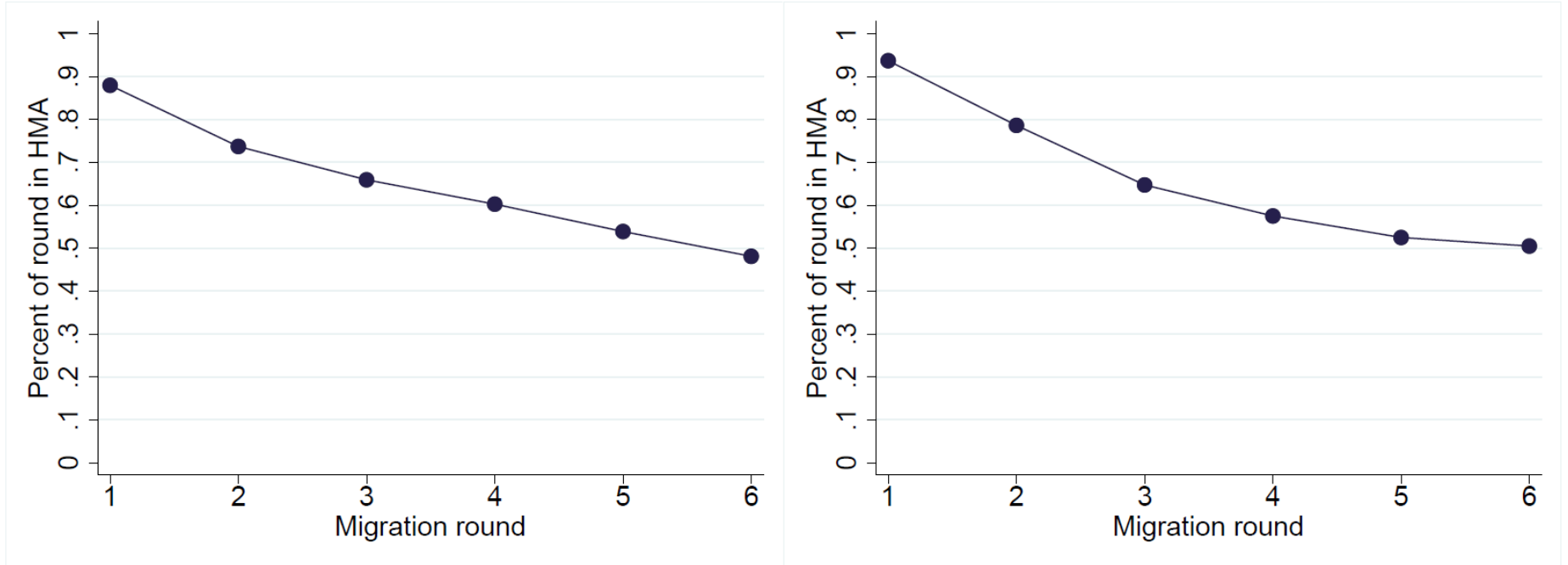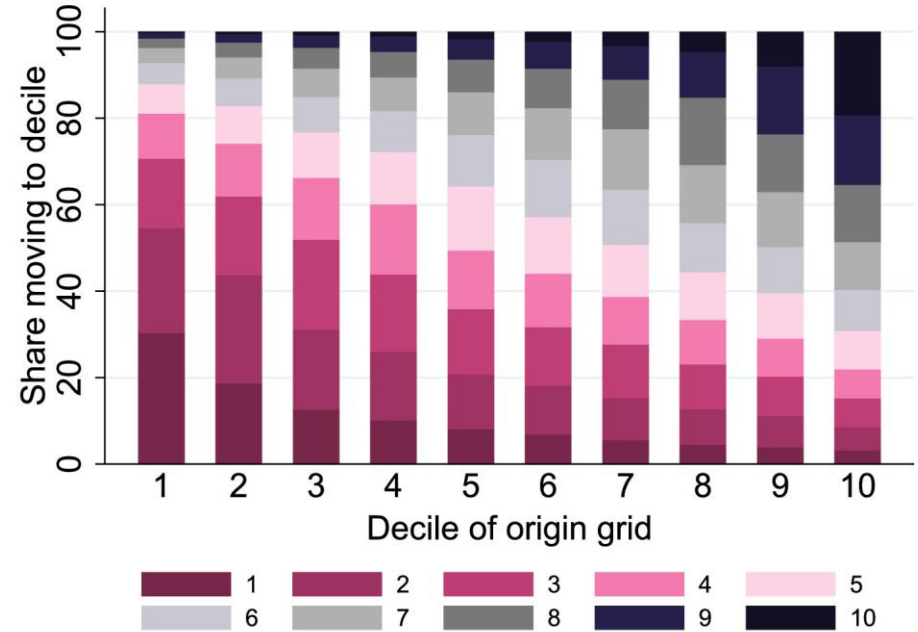

(a) Market-rate units

(b) Social housing units
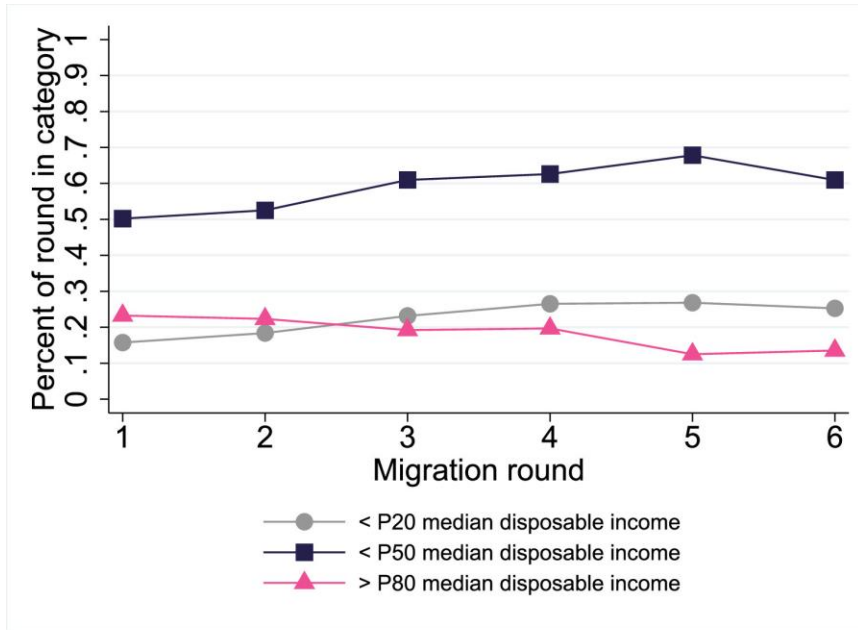
Mobility across neighborhoods
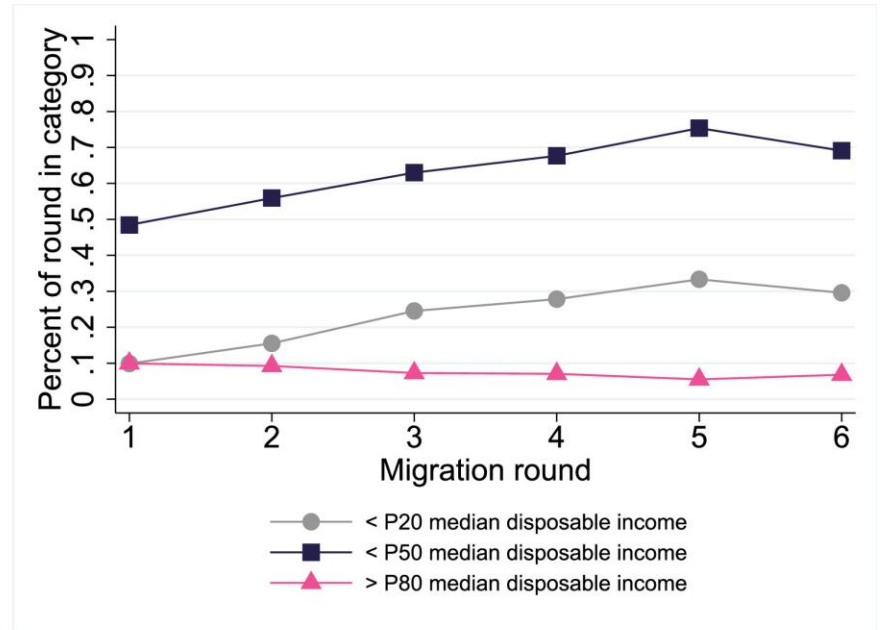

(a) Zip codes (b) 250m grids

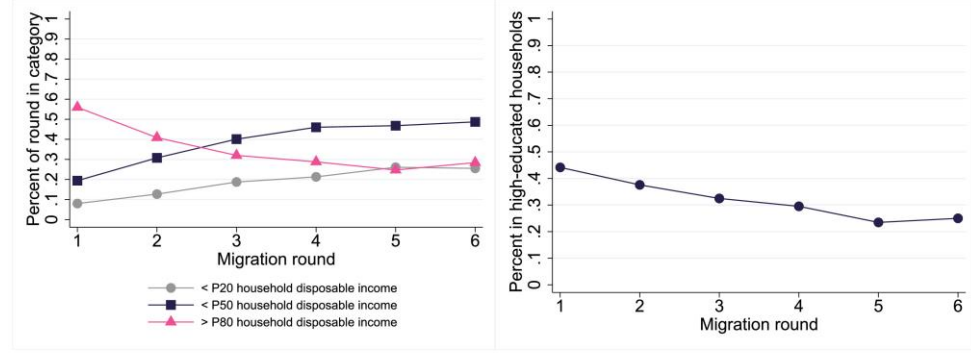# Origin neighborhood characteristics for movers at each round
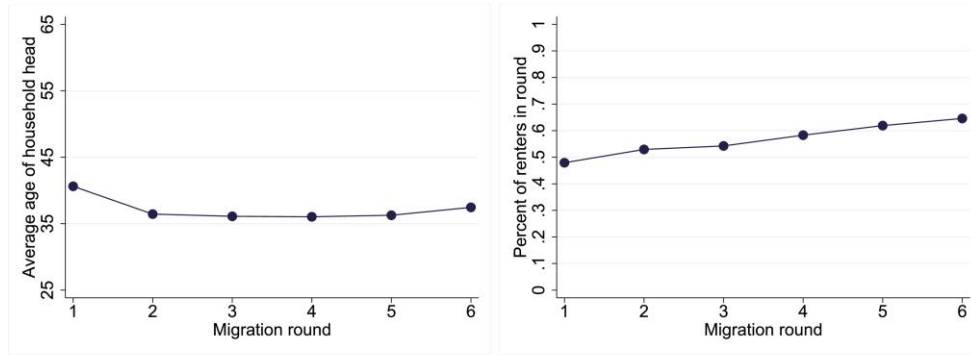

(a) Zip codes

(b) 250m grids

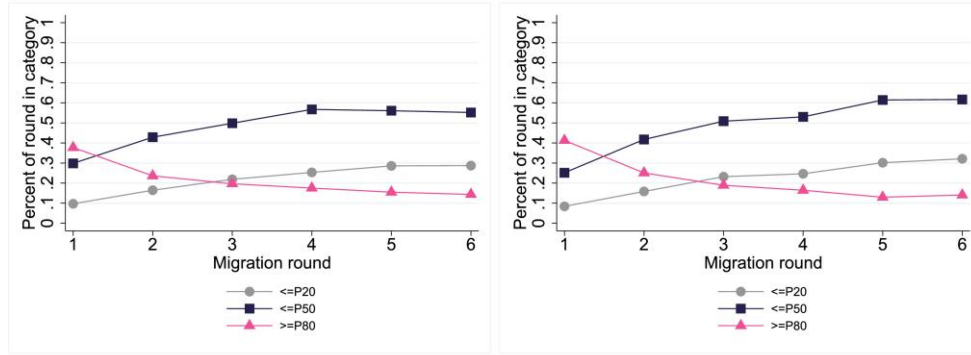# Individual characteristics for movers at each round
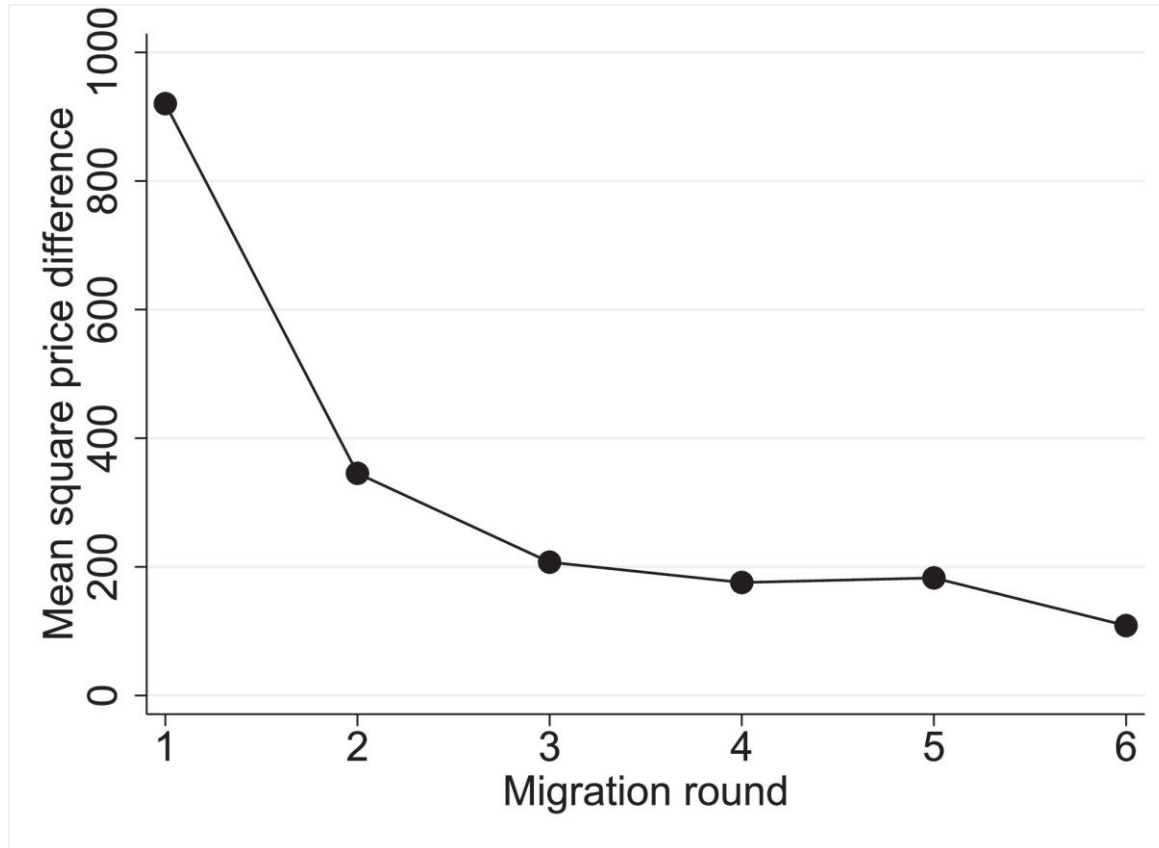

(a) Income

(b) Education

(c) Age

(d) Renter status

(e) Origin neighborhood

(f) Destination neighborhood

Change in mean neighborhood (zipcode) house prices at each round

Conclusions

- **Market-based strategies play an important role in improving housing affordability for middle- and low-income households**

- **Market-rate construction**

  - loosens the housing market in middle- and low-income areas even in the short run

  - is likely to improve affordability, even outside of the submarkets where new construction occurs

  - improves the lives of middle- and low-income as they are part of the moving chains

- **New buildings may have effects on their immediate area**

  - May change amenities or socio-economic makeup in ways that affect prices

JUE Insight: The effect of new market-rate housing construction on the low-income housing market ☆

Evan Mast ✉

W.E. Upjohn Institute for Employment Research, 300 S. Westnedge Avenue, Kalamazoo, MI 49007, United States

https://www.sciencedirect.com/science/article/pii/S0094119021000656

Local politics

Incentives of local politicians

- **The planner is an agent of current residents of the municipality**

  - Current residents can vote in municipal elections

  - People living in other municipalities do not have a democratic channel to affect land use policy and housing supply

  - And one could argue that these are the people most affected by local land policy as their labor market depends on new supply

- **The goals of the current residents may conflict with the goals of future residents (or wannabe residents) => NIMBY**

  - It is not clear that land use policy should be at the local level

Empirical evidence : 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

    - Happened due 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

Empirical evidence: Hankinson & Magazinnik (2022)

- **California Voting Rights Act of 2001**

  - Compelled over one hundred cities to switch from at-large to district elections for city council

- **DID estimates show**

  - District elections decrease the supply of new multifamily housing by roughly 50%, smaller effects on single-family housing

  https://www.mhankinson.com/documents/supply_equity_working.pdf

Empirical evidence: 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

- **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

Recap

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

  - E.g. externalities or spillovers from new development

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

- **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?