The Emergence of Exclusionary Zoning Across American Cities

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Paper: Importance of Racial Exclusionary Zoning

In U.S., local land use regulations shape urban form

- Would local competition over zoning provide efficiency, even if some actors exclude certain groups?
- What historical trends, through a local regulation channel, locked in urban form?

Research question: When U.S. suburbs were first planned, were they zoned restrictively in reaction to Black migration?
Paper: Importance of Racial Exclusionary Zoning

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► Would local competition over zoning provide efficiency, even if some actors exclude certain groups?
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Research question: When U.S. suburbs were first planned, were they zoned restrictively in reaction to Black migration?

Empirical context: U.S. postwar suburbanization, 1940–70
► Simultaneous with “Second Great Migration”: 4 million Black Americans moved out of South
Two challenges to causal inference

1. No database on how U.S. land use controls were first adopted exists
   ▶ Scant surviving records of local, decentralized process

2. Black migrants did not select cities at random
   ▶ Example: In cities with good jobs, rich left for suburbs earlier
     → Rich incumbents have non-racial motive to “zone out” poor
Empirical strategies

1. Novel algorithm measuring **timing and restrictiveness** of suburban zoning regulation: **minimum lot sizes**
   - Oldest homes where lots bunch inform first adoption of lot size
   - Degree of “bunching on lot sizes” quantify zoning restrictiveness

2. Shift-share IV for Black migration *(Boustan (2010), Derenoncourt (2022))*
   - Four findings support postwar exclusionary zoning as reaction to migrants’ race more than by income
Algorithm finds which minimum lots ever adopted

From oldest to newest housing vintages in each jurisdiction:
▶ Classify bunching bins with excess mass, or to left has missing mass

Example: PA, Lower Merion, 1940–60 homes
Algorithm finds which minimum lots ever adopted

From oldest to newest housing vintages in each jurisdiction:

- Measure bunching relative to baseline with gradient statistic

More on statistic

Example: PA, Lower Merion, 1940–60 homes
Measuring lot size adoption

Using administrative assessments data, algorithm processes 4,800 jurisdictions

Data span 85 years: empirical strategy focuses on 1940–70

Minimum Lot Size Adoption

Jurisdictions with over 5,000 people, %

Estimated Adoption Year

Measuring lot size adoption

Using administrative assessments data, algorithm processes 4,800 jurisdictions

- 60% of cities adopted lot size controls from 1940–70

Data span 85 years: empirical strategy focuses on 1940–70
Addressing endogeneity: Shift-share instrument

Strip out how the destination factors into $\Delta CC^{black}$ with shift-share instrument $Z^{Black}$: For destination central city $c$ and sending counties $k$,

$$Z^{Black}_{ct} = \sum_{\text{Southern } k} \tilde{\omega}_{c,1940}(k) \times \hat{g}_k(t),$$

With additional prediction of shocks through county $k$: push factors

- **Shares** taken over counties from which prewar Black migrants migrated
- **Shifts** in Black willingness to leave those counties changes instrument
Estimated causal effects are sizable

Baseline panel regression → cumulative Great Migration effect:

- Broken down by decade
- Reweighed by jurisdiction construction

Graph showing share of variation explained by 1 SD Black growth in CC, with OLS and IV estimates. Bootstrapped 95% confidence intervals shown.

First adoption of minimum lots:
Baseline: 0.95
N: 12024
Lot dist excess mass:
Baseline: 13.38
N: 10594
Mechanisms of postwar exclusion

1. Small lot size effects where there was low-income, non-Black migration
   
   - **Implications:** Racial exclusionary zoning separate effect from fiscal zoning (“excluding free-riders”)
   
   - **Method:** Repeat shift-share design using variation in migration of 8 million Southern White migrants

2. Exclusionary zoning explained by demand for segregated public schools
   
   - **Implications:** Exclusionary zoning a supply-side response to prejudiced demand, as some households “voted with their feet”
   
   - **Method:** Interact Black migration effects with early bans on school segregation across states

Results
Mechanisms of postwar exclusion

1. Small lot size effects where there was low-income, non-Black migration
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   - **Results**
Conclusion

Introduce a novel algorithm recovering dynamics of U.S. suburban lot size restrictiveness

▶ Time-varying measure of exclusionary zoning offers causal evidence on determinants

Local panel on lot size restrictiveness part of ongoing work:

▶ Are neighbourhood change dynamics different in restrictively zoned areas?
▶ Do metros with more exclusionary neighbourhoods face higher infrastructure costs and job sprawl?
Thank you!
More on gradient statistic

Wit lot size distribution $f^j(\ell)$, post-period $h^\tau$ after adoption $\tau$:

Estimating $\Delta f^j(\ell) = \log m_\ell - \log m_{[\ell-\mu,\ell]}$
More on gradient statistic

Distribution for pre-period before $\tau, h^{\tau'}$:
Estimating $\Delta f^j_{CF}(\ell) = \log m^j_{\ell} - \log m^j_{[\ell-\mu,\ell]}$

Recorded lot size (square feet)

<table>
<thead>
<tr>
<th>Density</th>
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<tbody>
<tr>
<td>0.00000</td>
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<tr>
<td>0.00005</td>
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<tr>
<td>0.00010</td>
</tr>
<tr>
<td>0.00015</td>
</tr>
<tr>
<td>0.00020</td>
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</tbody>
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Statistic Components
- Unused
- Lot size tested
- Assumed bunching region
More on gradient statistic

Calculate \( \hat{G}(\ell, \tau) = \Delta f^j(\ell) - \Delta f^j_{CF}(\ell) \), save \( \ell \) whose stat above critical value.
More on gradient statistic

Bunching not statistically apparent for real vintages before known adoption

Test Statistic Level

Recorded lot size (square feet)
White migrations yield opposite effects

Southern whites (+ foreign born) lower income than non-Southern whites

- Null results on lot size outcomes, contrary to exclusion only on income

Profiles of Southern migrants
Comparison migrant group: Southern whites

Southern whites 20% poorer on average than incumbent White households

Back
Robustness: Decade-specific effects

Disaggregate effect conversion for each decade

After legal bans on racial covenants in 1948, local governments further upheld lot size restrictiveness.

![Graph showing the share of variation explained by 1 SD Black growth in CC across different decades with bootstrapped 95% confidence intervals.](image)
Robustness: Alternate weighing

Effect increases when jurisdictions scaled by pre-1950 construction weights

Downweighting "never taker" jurisdictions not building in time period

![Graph showing share of variation explained by 1 SD Black growth in CC]

- OLS estimates
- IV estimates

First adoption of minimum lots
Baseline: 0.95
N: 11425

Lot dist excess mass
Baseline: 13.38
N: 10577

Bootstrapped 95% confidence intervals shown
Early variation in anti-discrimination laws

Immediately after WW2, certain states began banning institutional segregation (Murray 1950, Cook et. al. 2022)

Main finding: States with early bans on segregating schools had strongest causal effects of Black migration on lot size outcomes

Main table

► Before federal Civil Rights legislation, households “voted with feet” to laws
► Exclusionary zoning rational as legal tool to capture households’ WTP for segregated public goods?
Map of early ADE states
Causal effects larger in ADE states

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<thead>
<tr>
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<th>Lot Size Adoption</th>
<th>Excess Mass</th>
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<tr>
<td></td>
<td>OLS</td>
<td>IV</td>
</tr>
<tr>
<td>$\beta$</td>
<td>0.0596 (0.037)</td>
<td>0.224 (0.055)</td>
</tr>
<tr>
<td>$\beta^{ADE}$</td>
<td>0.110 (0.052)</td>
<td>0.186 (0.078)</td>
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<tr>
<td>Outcome mean</td>
<td>0.783</td>
<td>0.783</td>
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Specifications include all controls; standard errors clustered over metro-decade.