Competition vs. Coordination
Local Government Centralization and Metropolitan Growth

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Motivation

How should the local public sector be organized?

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St. Louis Metropolitan Area



- 2017 Population: ∼2.8 Million
- Founded: 1764
- **Decentralized**
  - 606 local governments

Baltimore Metropolitan Area



- 2017 Population: ∼2.8 Million
- Founded: 1729
- **Centralized**
  - 33 local governments

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*St. Louis **decentralizes** governance across many small jurisdictions.*

*Baltimore **centralizes** governance into a few large governments.*

Competition between Governments: Race to the Top? Or to the Bottom?

Organization affects how decision-making authority is distributed across governments

How authority is allocated highlights a fundamental tradeoff

- Decentralization ⇒ Many decision-makers ⇒ Competition
- Centralization ⇒ Few decision-makers ⇒ Coordination

Debate over organization revolves around a key tension

- Does **decentralization** correct **government failure** with competition?
  ⇒ Information and incentives of public officials
- Or does **centralization** correct **coordination failure** created by competition?
  ⇒ Externalities distort decentralized decision-making

Which force matters more for metropolitan growth?

This Paper

Research Question 1:

What was the effect of local gov. centralization on metropolitan growth?

Measure local government centralization

- Construct a **centralization index** to quantify centralization in each US metro

Empirical Strategy

- Regress metropolitan growth on cross-sectional variation in centralization
- Examine both population and employment growth
- Instrument centralization with the number of post office closures between 1902–1910

Research Question 2:

What mechanism(s) can explain the effect of centralization on metropolitan growth?

Preview of Results

What was the effect of local gov. centralization on metropolitan growth?

Across time, a std. dev. increase in centralization **increases** growth by $\frac{2}{5}^{th}$ of a std. dev.

- Results are driven by small but persistent effects that accumulate
- Suggests **coordination failure** is the dominant concern at the metropolitan scale

*What mechanism(s) explain the **positive** effect of centralization on growth?*

I find that more centralized MSAs...

- hire more local government workers
- collect more tax revenue
- are less likely to host data centers

Rules out a narrow **economies of size** alternative channel

Suggests that **coordination failures** are salient enough to affect firm decision making

Related Literature

Fiscal Federalism: Oates (1972)

- **Decentralized**: Tiebout (1956), Brennan & Buchanan (1980), Hatfield (2015)
- **Centralized**: Wilson (1986), Zodrow & Mieszkowski (1986), Wildasin (1988)

Political Merger Evaluations:
Reingewertz (2012), Tang & Hewings (2017), Blom-Hansen et al. (2016), Miyazaki (2018), Hall et al. (2018), Egger et al. (2022), Karlsson & Thór Eythórsson (2022), Cerqua et al. (2026)

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▸ Data Sources

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Roadmap

1. Setting and Measuring Centralization
   - Background and Local Government Data
   - Persistence in Local Government Organization
   - Measuring Centralization
2. Effect of Centralization on Growth
3. Mechanisms
4. Recap and Conclusion

Background and Setting

Main Data: Annual Survey of Public Employment and Payroll

- Number of full-time employees for all local govs in the US
- Survey years: 1987, 1997, 2007, and 2017

What is a local government?

- Cities, counties, school districts, and special districts

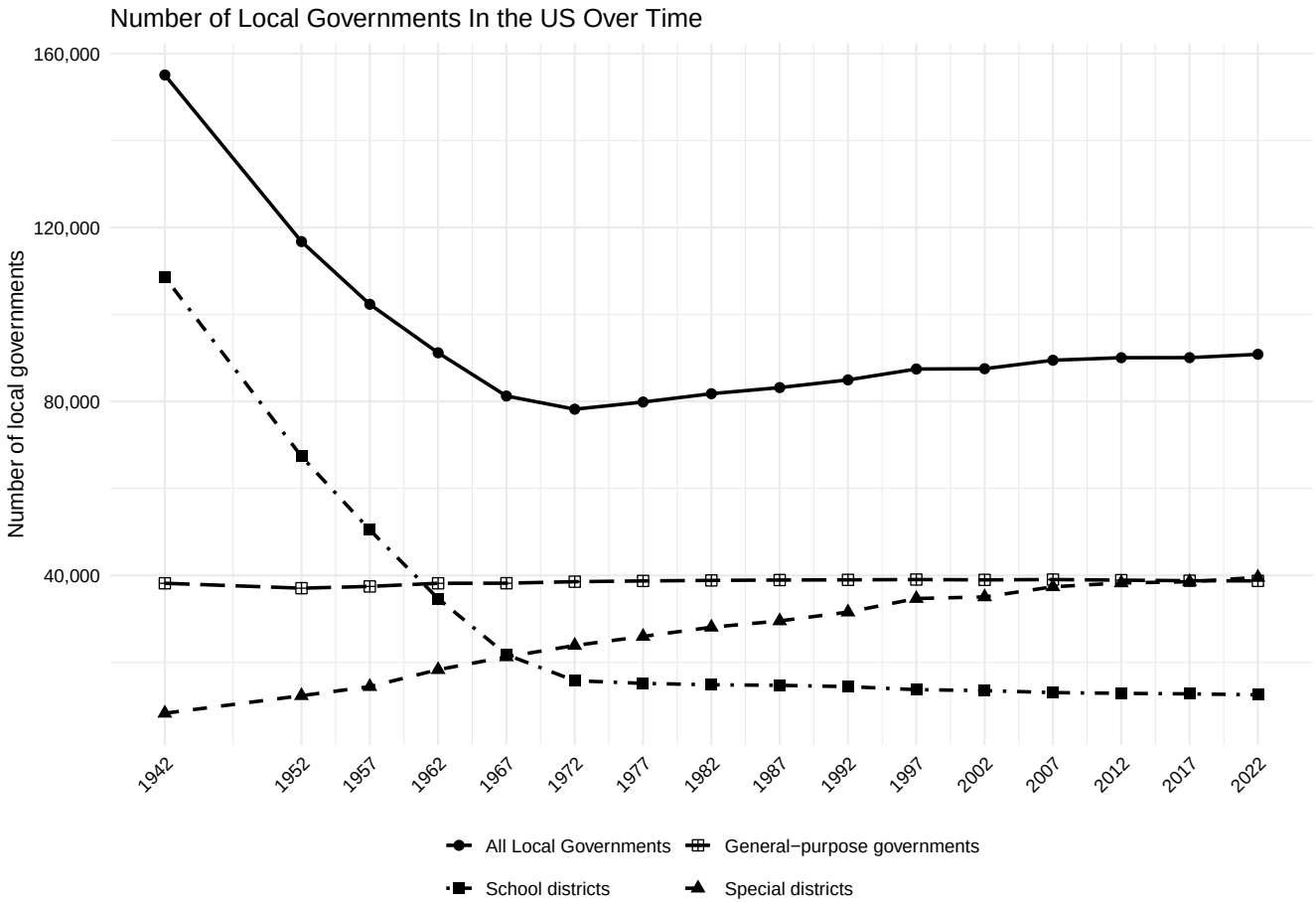
Unit of Analysis: 378 continental Metropolitan Statistical Areas (MSA)

- Group of counties with an urban core and significant commuting ties: labor market
- Typically anchored by large principal cities
- Fix MSAs using 2017 definitions, same geographic footprint throughout

As of 2025...

- 85% of the US population lives within an MSA
- Within MSA, 61% live in suburbs outside principal cities

Local Government Organization is Persistent After 1970



Changes after 1970 are driven almost exclusively by new special districts

- Single-purpose taxing districts (Ruggieri 2025): $\sim$ 45% have no employees
- Only $\sim$ 6% of all local government employment

Local Government Organization is Persistent After 1970

	Spearman Rank Correlation		
	Centralization Index: 2017		
	(1)	(2)	(3)
Centralization Index: 2007	0.987***		
	(0.008)		
Centralization Index: 1997		0.966***	
		(0.013)	
Centralization Index: 1987			0.943***
			(0.017)
Observations	378	378	378
R^2	0.974	0.933	0.889

*p<0.1; **p<0.05; ***p<0.01

Empirical Takeaway: little within-MSA variation, must exploit between-MSA variation

Employment-Based Centralization Index

Centralization has been measured many ways in the literature

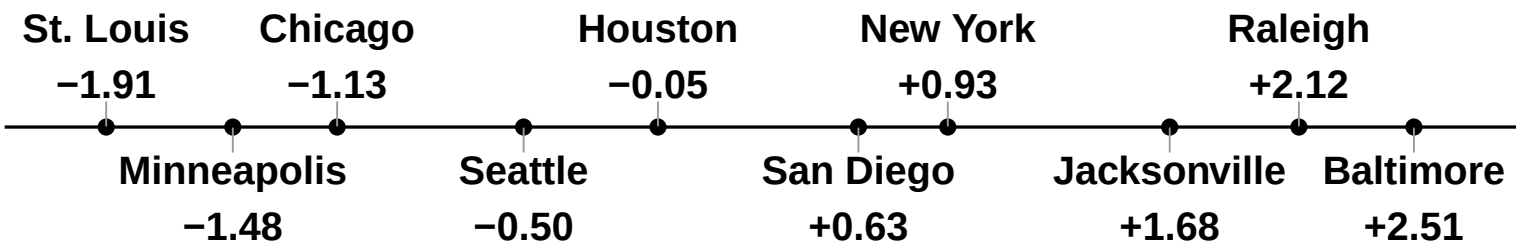
- Counts, HHI, concentration ratios
- Population, land area, expenditure, revenue

I measure centralization with the **distribution of local gov employment** across govs

- Blend techniques/insights from the IO and ecology literatures
- Index is orthogonal to population and land area by construction

Decentralized metros disperse employment across many small governments

Centralized metros concentrate employment in a few larger governments



Local Government Centralization Index: 1/3

AKY (2024): create a family of ***concentration*** statistics from industry market shares

I create a family of ***centralization*** statistics from local gov employment shares

Construct within-MSA local gov. employment shares

- s_{jmt}: share of employment in government j of MSA m during survey-year t

For each MSA, vary q to extract a family of centralization statistics

$$\lambda(q; s_{mt}) = \left(\sum_{j=1}^{|s_{mt}|} s_{jmt}^{q} \right)^{\frac{1}{1-q}}$$

Every q is a valid centralization measure, common measures are special cases

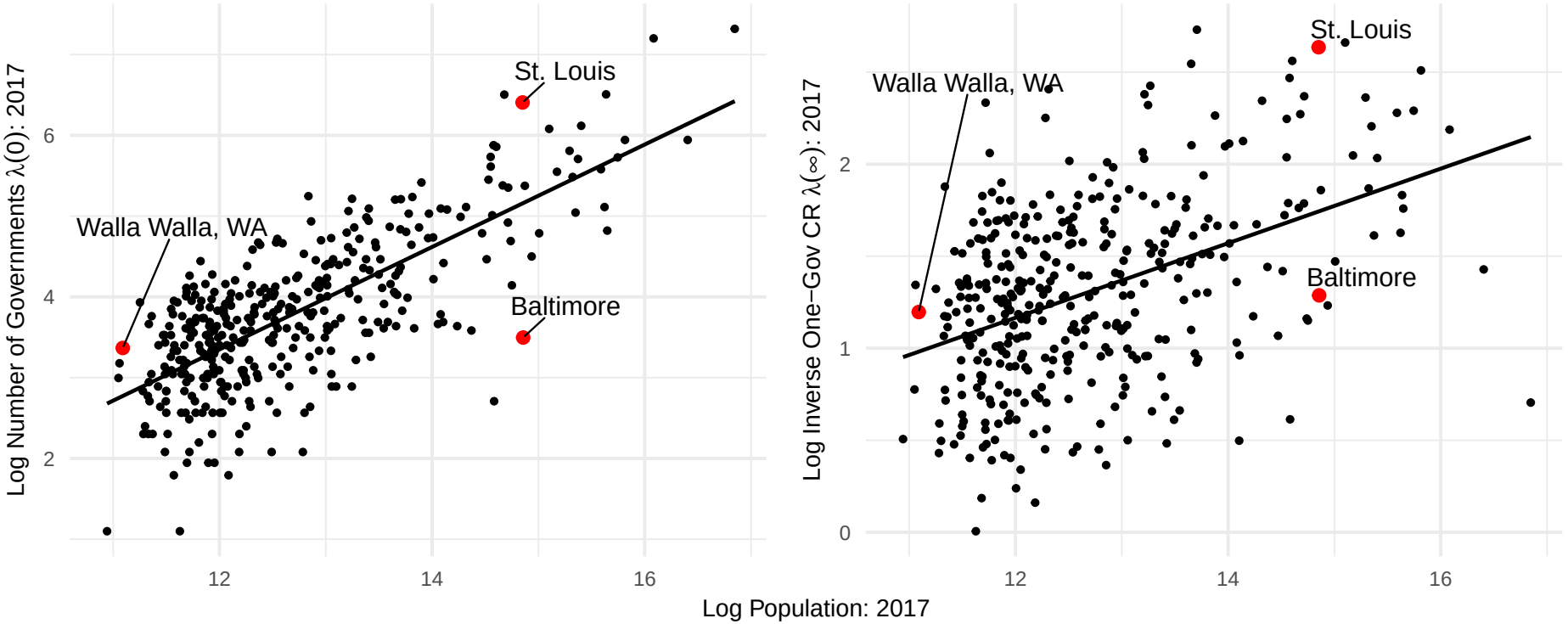
- $\lambda(0; s)$ - counts local govs
- $\lambda(2; s)$ - inverse HHI
- $\lambda(\infty; s)$ - inverse one-gov concentration ratio

Each q can be interpreted as an "effective number of governments"

Local Government Centralization Index: 2/3

Interpretation of centralization statistics depends on scale

- 100 local govs may be decentralized or centralized depending on MSA population



Because of their similar population, we can compare St. Louis and Baltimore

But we cannot directly compare Baltimore to Walla Walla, WA

Local Government Centralization Index: 3/3

For each centralization statistic q, across MSA and survey years, I estimate

$$\log \lambda(q; s_{mt}) = \alpha + \beta_{qP} \log P_{mt} + \beta_{qL} \log L_m + \epsilon_{qmt}$$

Rearrange and center

$$\widehat{\lambda(q; s_{mt})} = \log \frac{\lambda(q; s_{mt})}{P_{mt}^{\beta_{qP}} L_m^{\beta_{qL}}} = \log \frac{\text{Effective \# of Govs.}}{\text{Predicted \# of Govs.}}$$

Aggregate across statistics to construct the **centralization index**

$$C_{mt} = -\sum_{q=1}^{50} w_q \cdot \widehat{\lambda(q; s_{mt})}$$

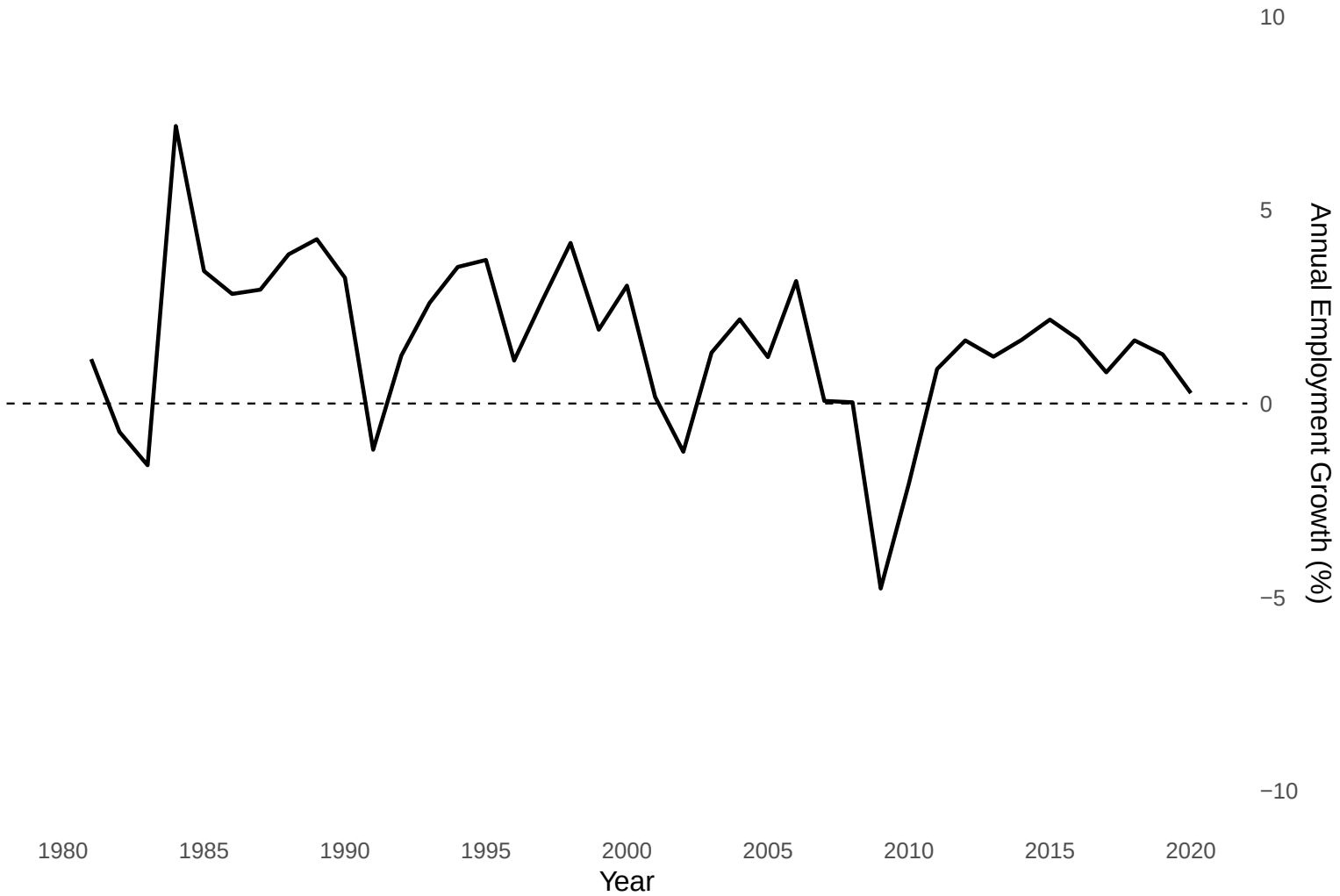
I choose weights using PCA and use the standardized first principal component

- Extracts common component across statistics that I label as centralization
- Explains over 80% of within-year variation, 77% when pooling years

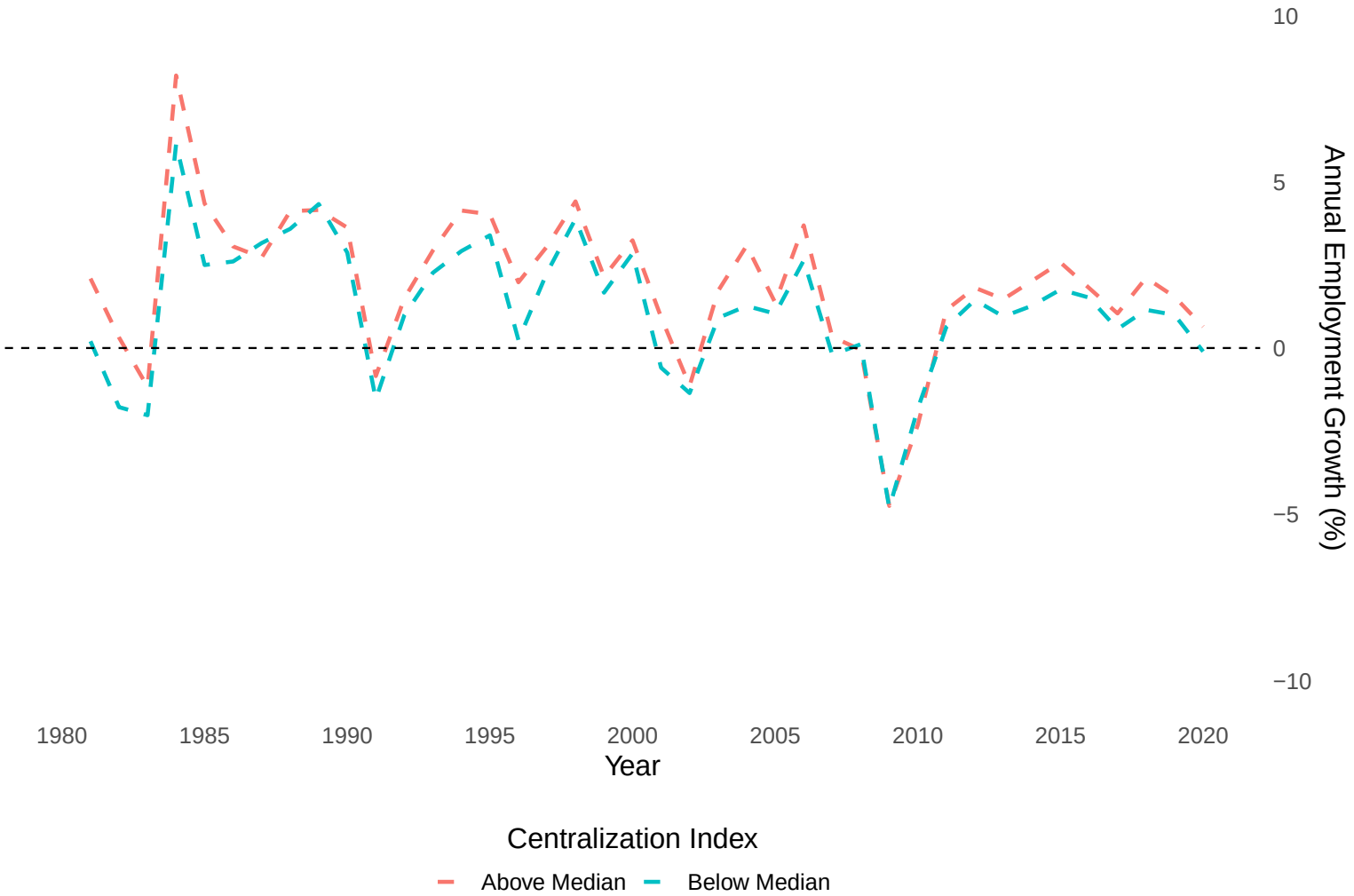
Roadmap

1. Setting and Measuring Centralization
2. Effect of Centralization on Growth
   - Explore the effect graphically
   - Endogeneity and the Rural Free Delivery Instrument
   - IV Estimates
3. Mechanisms
4. Recap and Conclusion

Annual Employment Growth



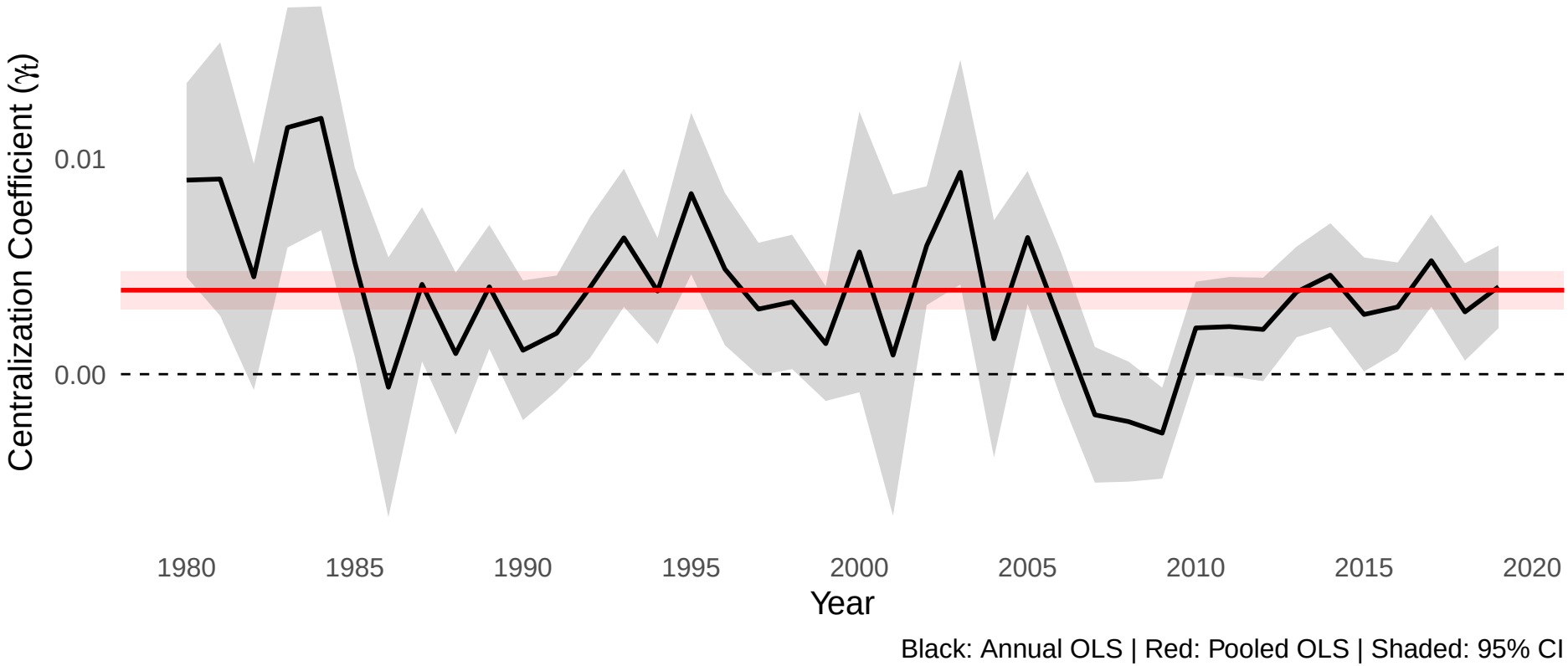
Annual Employment Growth: Centralized vs. Decentralized



Centralized metros grow *slightly* more than decentralized metros in *most* periods

Annual Effect of Centralization on Employment Growth

$$\log \frac{\text{Emp}_{m,t+1}}{\text{Emp}_{m,t}} = \alpha_t + \beta_t \log \text{Emp}_{m,t} + \gamma_t C_m + \epsilon_{m,t+1}$$



Black: Annual OLS | Red: Pooled OLS | Shaded: 95% CI

A std. dev. increase in centralization predicts .3% higher annual growth

Cumulative Employment Growth: Centralized vs. Decentralized



Small but persistent effects accumulate into large differences in growth across time

Cumulative Growth Specification

Estimate cumulative, rather than annual, effect of centralization on growth

Let $Y_{m,t}$ be either employment or population in MSA m during year t

$$\log \frac{Y_{m,2020}}{Y_{m,\text{Base}}} = \alpha + \beta Y_{m,\text{Base}} + \gamma C_m + \delta G_m + \psi A_m + \lambda_m + + \xi_m + u_m$$

Coefficient of Interest - γ: cumulative effect of centralization on growth

Omitted Determinant of Growth - ξ_m: potentially correlated with centralization

Geographic Controls - G_m: land and surface water area, natural amenities index

Metropolitan Age - A_m: number of years between first post office and 1902

Fixed Effects - λ_m: type of largest gov, port, Rust Belt indicator, Census Divisions

Endogeneity between Centralization and Growth

OLS is biased if centralization correlates with an omitted determinant of growth

Defining endogeneity between centralization and growth can be difficult

Many potential omitted-variables are **post-treatment**, excluded from specification

- Crime likely reduces growth, but centralization may affect efficiency of policing
- Including crime controls for a potential path that centralization affects growth
- More examples: Human capital through schooling; infrastructure through public investment; and housing prices through land-use regulation

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Remaining Concerns:

Information Loss: 1-D index abstracts from potentially important heterogeneity

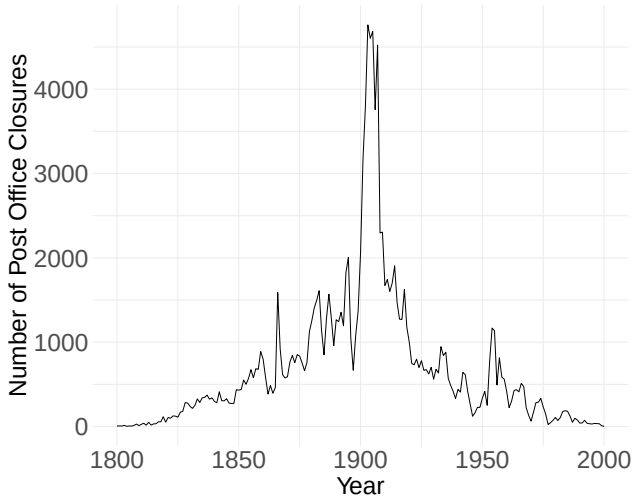
- Vertical fragmentation, employment specialization, and administrative rules

Omitted Institutions: local government is only a subset of all active institutions

- Civil/business societies, HOAs, non-profits, state/federal programs
- Develop jointly with/in response to local government, difficult to separate empirically

IV Empirical Strategy: First Stage

Instrument centralization with the log number of post office closures between 1902–1910



	Centralization Index				
	2017	2007	1997	1987	Pooled
	(1)	(2)	(3)	(4)	(5)
RFD: Number of Post Office Closures	-0.304^{***}	-0.308^{***}	-0.292^{***}	-0.291^{***}	-0.300^{***}
	(0.050)	(0.051)	(0.053)	(0.053)	(0.025)
F-statistic	33.1	32.64	25.95	25.01	120.38
Observations	378	378	378	378	1,512
R^2	0.612	0.600	0.570	0.567	0.583

*p<0.1; **p<0.05; ***p<0.01

First-Stage Robustness:

▶ Population Size ▶ MSA Age ▶ Geography ▶ Linearity

Rural Free Delivery

US Postal Department fully implements *Rural Free Delivery* in 1902

- Prior to implementation, rural residents collected mail at local post offices
- After implementation, free delivery to every mailbox, large wave of closures
- *Rural* post office closures, extension of *Free City Delivery* implemented in 1863

Number of closures proxies for the number of 19th-century rural settlement nodes

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Number of closures proxies for the number of 19th-century rural settlement nodes

Interpretation: increases decentralization through municipal annexation process

- Burns (1994): local gov. structure emerges from annexation/defensive incorporation
- More post office closures $\iff$ More rural settlement nodes
- More rural settlement nodes $\Rightarrow$ More potential annexation conflicts
- More potential annexation conflicts $\Rightarrow$ More defensive incorporation
- More defensive incorporation $\Rightarrow$ Greater decentralization

▸ Potential Threats ▸ Offensive Incorporation Example

Understanding the Tables

Show 8 IV estimates of the effect of centralization on growth: γ

- Base Years: 2007, 1997, 1987, 1977
- Panel A: Private Employment Growth, Panel B: Population Growth
- Other covariates have been suppressed in the table
- All use the pooled centralization index

Centralization indices and growth outcomes have been standardized

"A std. dev. increase in centralization caused a γ std. dev. change in growth between the base year and 2020"

Standard errors are clustered at the state level

- MSAs are assigned to the state hosting the largest government

Show 3 auxiliary statistics

1. Kleibergen–Paap rk Wald F-statistic: weak-IV robust F-statistic
2. Anderson/Rubin p-value: weak-IV robust hypothesis test of $\gamma = 0$
3. OLS estimate: γ estimated with the same specification, but not 2SLS

Local Government Centralization Increased Growth

	Cumulative Growth from Base Year to 2020			
	Base: 2007	Base: 1997	Base: 1987	Base: 1977
	(1)	(2)	(3)	(4)
Panel A: Employment Growth				
Centralization Index	0.538***	0.658***	0.382**	0.298*
	(0.184)	(0.187)	(0.169)	(0.177)
KP rk Wald F-statistic	32.73	31.37	30.89	31.05
Anderson–Rubin p-value	0.0141	0.0017	0.0576	0.1334
Centralization OLS Estimate	0.13*	0.21***	0.22***	0.23***
Observations	378	378	378	378
Panel B: Population Growth				
Centralization Index	0.338*	0.449*	0.428*	0.439*
	(0.174)	(0.232)	(0.242)	(0.241)
KP rk Wald F-statistic	29.31	28.31	28.4	28.28
Anderson–Rubin p-value	0.105	0.0354	0.0431	0.0278
Centralization OLS Estimate	0.16**	0.18***	0.2***	0.23***
Observations	378	378	378	378

*p<0.1; **p<0.05; ***p<0.01

Between 1977 and 2020...

Decentralized St. Louis grew 14%

Centralized Baltimore grew 29%

Roadmap

1. Setting and Measuring Centralization
2. Effect of Centralization on Growth
3. Mechanisms
   - Economies of Scale or Externalities?
   - Externalities and Policy Competition
   - Who is more likely to host a data center?
4. Recap and Conclusion

Mechanisms

*What mechanism can explain the **positive** effect of centralization on growth?*

Oates' Decentralization Theorem (1972):

- Decentralization is more efficient absent **externalities** or **economies of size**

Remaining empirical exercises distinguish between two competing mechanisms

Did more centralized metros grow faster by internalizing externalities?

Or did more centralized metros grow faster because of economies of size?

Technical Efficiency Through Economies of Size?

An intuitive explanation is that centralization makes metros more *technically efficient*

- Provide the same public good bundle at a lower cost
- Expand public good production at a constant cost

Growth stems from cost-savings passed onto residents and firms

Narrow economies of size mechanism predicts centralized metros use fewer inputs

- Hire fewer local government employees
- Collect less in taxes

Does this explanation match the data?

Centralized Local Governments Hire More Workers

$$\log \text{Local Gov Employment}_{m,t} = \alpha + \beta \log P_{m,t} + \gamma C_{m,t} + \delta G_m + \psi A_m + \lambda_m + \xi_{mt} + u_{m,t}$$

	Local Government Employment				
	2017	2007	1997	1987	Pooled
	(1)	(2)	(3)	(4)	(5)
Centralization Index: 2017	0.094**				
	(0.047)				
Centralization Index: 2007		0.101**			
		(0.045)			
Centralization Index: 1997			0.136**		
			(0.061)		
Centralization Index: 1987				0.125**	
				(0.050)	
Centralization Index: Pooled					0.110**
					(0.047)
KP rk Wald F-statistic	31.44	31	24.65	23.76	118.63
Anderson–Rubin p-value	0.0144	0.0053	5e-04	7e-04	0
Centralization OLS Estimate	-0.0081	-0.0068	0.0022	0.0053	-0.0021
Observations	378	378	378	378	1,512

*p<0.1; **p<0.05; ***p<0.01

Centralized Local Governments Collect More Tax Revenue

$$\log \text{Revenue}_{m,t} = \alpha + \beta \log P_{m,t} + \gamma C_{m,t} + \phi \text{Mean Wage}_{mt} + \delta G_m + \psi A_m + \lambda_m + \xi_{mt} + u_{m,t}$$

Panel A: Total Revenue

	Dependent variable:				
	2017	2007	1997	1987	Pooled
	(1)	(2)	(3)	(4)	(5)
Centralization Index: 2017	0.197***				
	(0.050)				
Centralization Index: 2007		0.237***			
		(0.066)			
Centralization Index: 1997			0.200***		
			(0.059)		
Centralization Index: 1987				0.166***	
				(0.061)	
Centralization Index: Pooled					0.180***
					(0.050)
KP rk Wald F-statistic	30.32	30.14	24.22	25.76	119.91
Anderson–Rubin p-value	1e-04	0	1e-04	0.0023	0
Centralization OLS Estimate	0.017	0.016	0.024*	0.013	0.016**
Observations	378	378	378	378	1,512

*p<0.1; **p<0.05; ***p<0.01

Panel B: Tax Revenue

	Tax Revenue				
	2017	2007	1997	1987	Pooled
	(1)	(2)	(3)	(4)	(5)
Centralization Index: 2017	0.167**				
	(0.067)				
Centralization Index: 2007		0.220***			
		(0.083)			
Centralization Index: 1997			0.163**		
			(0.076)		
Centralization Index: 1987				0.157**	
				(0.071)	
Centralization Index: Pooled					0.160***
					(0.061)
KP rk Wald F-statistic	30.32	30.14	24.22	25.76	119.91
Anderson–Rubin p-value	0.0023	0	0.0035	0.0074	0
Centralization OLS Estimate	0.021	0.054***	0.03*	0.025	0.03***
Observations	378	378	378	378	1,512

*p<0.1; **p<0.05; ***p<0.01

Economies of Size Mechanism is Unlikely

I find that more centralized MSAs...

- hire more local government workers
- collect more tax revenue

This pattern is difficult to explain through technical efficiency alone

- Narrow economies of size mechanism reduces required inputs

Economies of size can still rationalize the data, but requires a strong *rebound effect*

- Technical efficiency lowers per-unit costs of public goods
- Lower per-unit price induces an expansion in demand for public goods
- Requires demand to be highly elastic, literature estimates highly inelastic demand

Centralization's positive effect on growth is unlikely to stem from economies of size

Externalities and Policy Competition

Policy competition: local governments choose policy *strategically*

- Tax rates, regulation, expenditures, subsidies
- Policy choices respond to the choices of neighboring governments

Canonical example: **tax competition**

- Governments choose tax rates to compete for a mobile tax base

Individual governments do not internalize their *fiscal externality*

- Attracting tax base partly comes at neighbors' expense
- Raising tax rate diverts tax base to their neighbor

Centralized metros better internalize fiscal externalities, leading to

- Higher tax rates $\Rightarrow$ collect more tax revenue
- Greater input use $\Rightarrow$ hire more local government workers

Tax competition matches empirical findings.
But do we have direct evidence that externalities play an important role?

Data Centers as a Mobile Tax Base

Data centers are a close empirical analog to mobile tax base in tax competition models

- New construction is highly mobile and highly tax sensitive

Firms constructing data centers can choose among many potential metro areas

Analogy: data centers are ***sellers*** choosing among many potential auctions

Decentralized metros resemble auctions with many bidders

- In standard settings, more bidders improve outcomes for the seller
- Firms have the incentive to disproportionately locate in decentralized metros

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Additional push from potential spillover externalities

- Suppose every gov in an MSA would prefer not to have a data center
- Benefits are local: host jurisdiction collects tax revenue
- Costs are metropolitan: electricity prices (Alvarez et al. 2026)
- Similar to a prisoner's dilemma: mutual restraint becomes harder with more players

Centralized Metros are Less Likely to Host Data Centers

$$\text{Data Center}_m = \alpha + \beta \log P_{m,2017} + \gamma C_{m,2017} + \delta G_m + \psi A_m + \lambda_m + \xi_m + u_m$$
$$\text{Data Center}_m \in \{0, 1\}$$

	Dependent variable:		
	Data Center in MSA		
	(1)	(2)	(3)
Centralization Index: 2017	-0.197^{**}	-0.259^{**}	-0.246^{**}
	(0.092)	(0.114)	(0.106)
Private Employment Growth: 1997–2017		0.386^{**}	0.363^{**}
		(0.171)	(0.160)
Virginia Fixed Effect			0.239^{**}
			(0.096)
KP rk Wald F-statistic	31.44	26.19	26.89
Anderson–Rubin p-value	0.0351	0.015	0.0185
Centralization OLS Estimate	0.037	0.031	0.029
Observations	378	378	378

*p<0.1; **p<0.05; ***p<0.01

Effect of centralization flips for data centers

Highly mobile and tax sensitive, exactly the margin most sensitive to tax competition

Recap of Results

What was the effect of local gov. centralization on metropolitan growth?

I find that centralization **increases** both population and employment growth

- Driven by small annual effects that compound

*What mechanisms can explain the **positive** effect of centralization on growth?*

I find that more centralized MSAs...

- hire more local government workers
- collect more tax revenue
- are less likely to host data centers

Rules out a narrow economies of size mechanism

Suggests coordination failures are salient enough to affect firm decision-making

Conclusion

Measured variation in local government centralization across MSAs

Instrumented centralization with post office closures following Rural Free Delivery in 1902

Found that greater centralization caused higher metropolitan growth

One potential interpretation:

- Local gov. presents a case where externalities are highly salient
- Centralization allows metros to better internalize externalities
- Centralized metros therefore can overcome the under-provision of public goods
- Increased public good provision attracts growth

Thank You!

Questions?

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Part I

Appendix

Within-MSA Centralization Persistence

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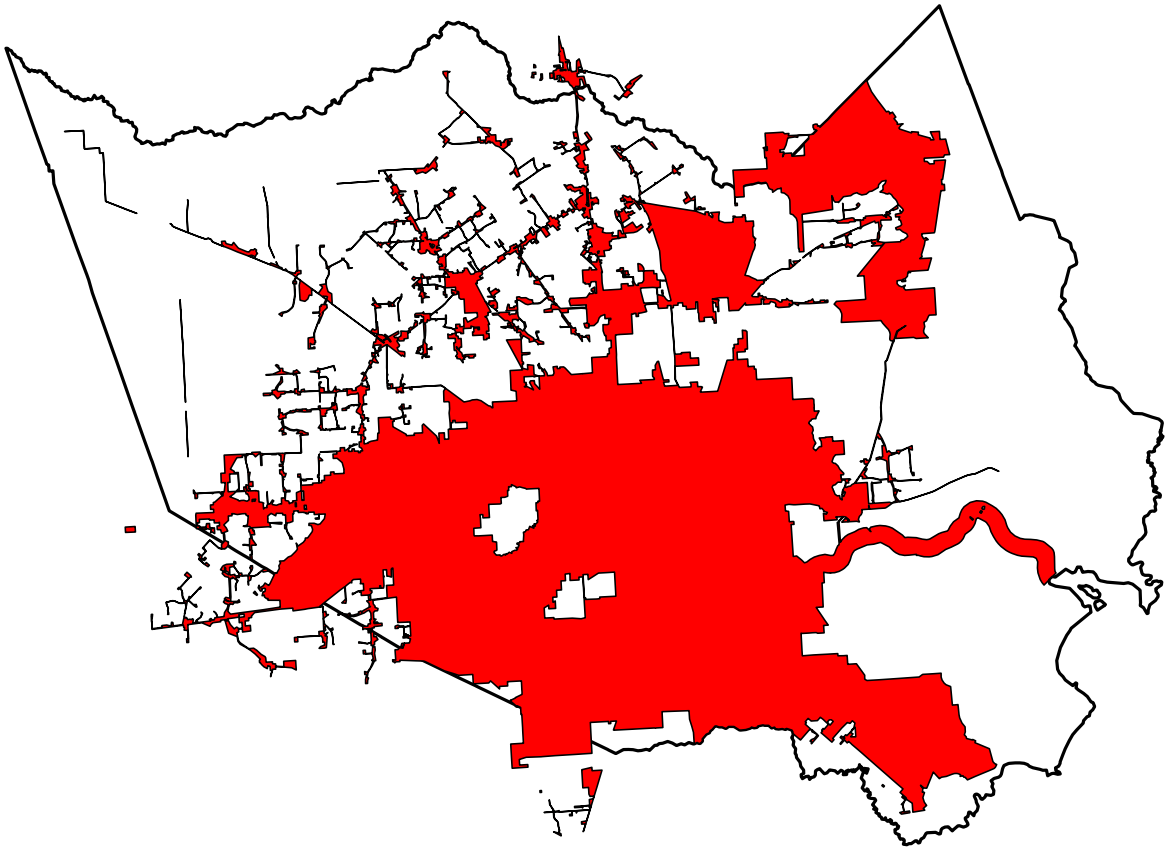
	Dependent variable:		
	Centralization Index: 2017		
	(1)	(2)	(3)
Centralization Index: 2007	0.988***		
	(0.008)		
Centralization Index: 1997		0.969***	
		(0.013)	
Centralization Index: 1987			0.948***
			(0.016)
Observations	378	378	378
R^2	0.977	0.938	0.898

*p<0.1; **p<0.05; ***p<0.01

Offensive Incorporation: Houston

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Houston Municipal Boundaries and Harris County



First-Stage Robustness: Population

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	Centralization Index			
	2017	2007	1997	1987
	(1)	(2)	(3)	(4)
RFD: Number of Closures × 1st Population Quintile	−0.356***	−0.341***	−0.319***	−0.346***
	(0.060)	(0.060)	(0.063)	(0.064)
RFD: Number of Closures × 2nd Population Quintile	−0.330***	−0.330***	−0.348***	−0.331***
	(0.057)	(0.059)	(0.062)	(0.062)
RFD: Number of Closures × 3rd Population Quintile	−0.294***	−0.316***	−0.286***	−0.291***
	(0.057)	(0.057)	(0.059)	(0.059)
RFD: Number of Closures × 4th Population Quintile	−0.264***	−0.269***	−0.247***	−0.212***
	(0.053)	(0.055)	(0.057)	(0.056)
RFD: Number of Closures × 5th Population Quintile	−0.186***	−0.209***	−0.179***	−0.177***
	(0.053)	(0.054)	(0.056)	(0.055)
Observations	378	378	378	378
R^2	0.602	0.592	0.563	0.562

*p<0.1; **p<0.05; ***p<0.01

First-Stage Robustness: Age

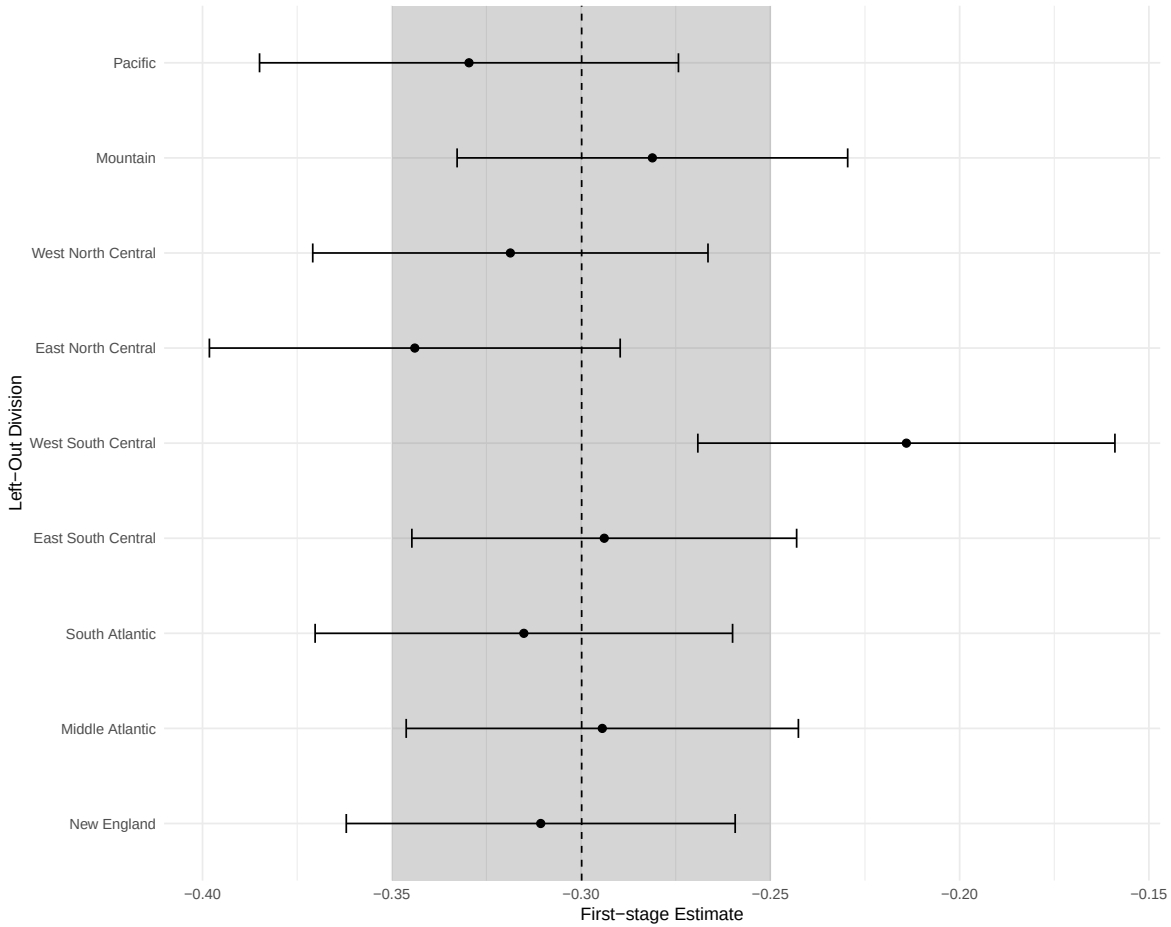
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	Centralization Index			
	2017	2007	1997	1987
	(1)	(2)	(3)	(4)
RFD: Number of Closures × 1st Age Quintile	−0.283***	−0.282***	−0.272***	−0.290***
	(0.065)	(0.067)	(0.069)	(0.069)
RFD: Number of Closures × 2nd Age Quintile	−0.321***	−0.320***	−0.317***	−0.320***
	(0.057)	(0.058)	(0.060)	(0.061)
RFD: Number of Closures × 3rd Age Quintile	−0.328***	−0.325***	−0.316***	−0.307***
	(0.054)	(0.055)	(0.057)	(0.057)
RFD: Number of Closures × 4th Age Quintile	−0.282***	−0.284***	−0.263***	−0.257***
	(0.051)	(0.052)	(0.054)	(0.054)
RFD: Number of Closures × 5th Age Quintile	−0.251***	−0.271***	−0.241***	−0.247***
	(0.051)	(0.052)	(0.055)	(0.055)
Observations	378	378	378	378
R^2	0.616	0.602	0.574	0.570

*p<0.1; **p<0.05; ***p<0.01

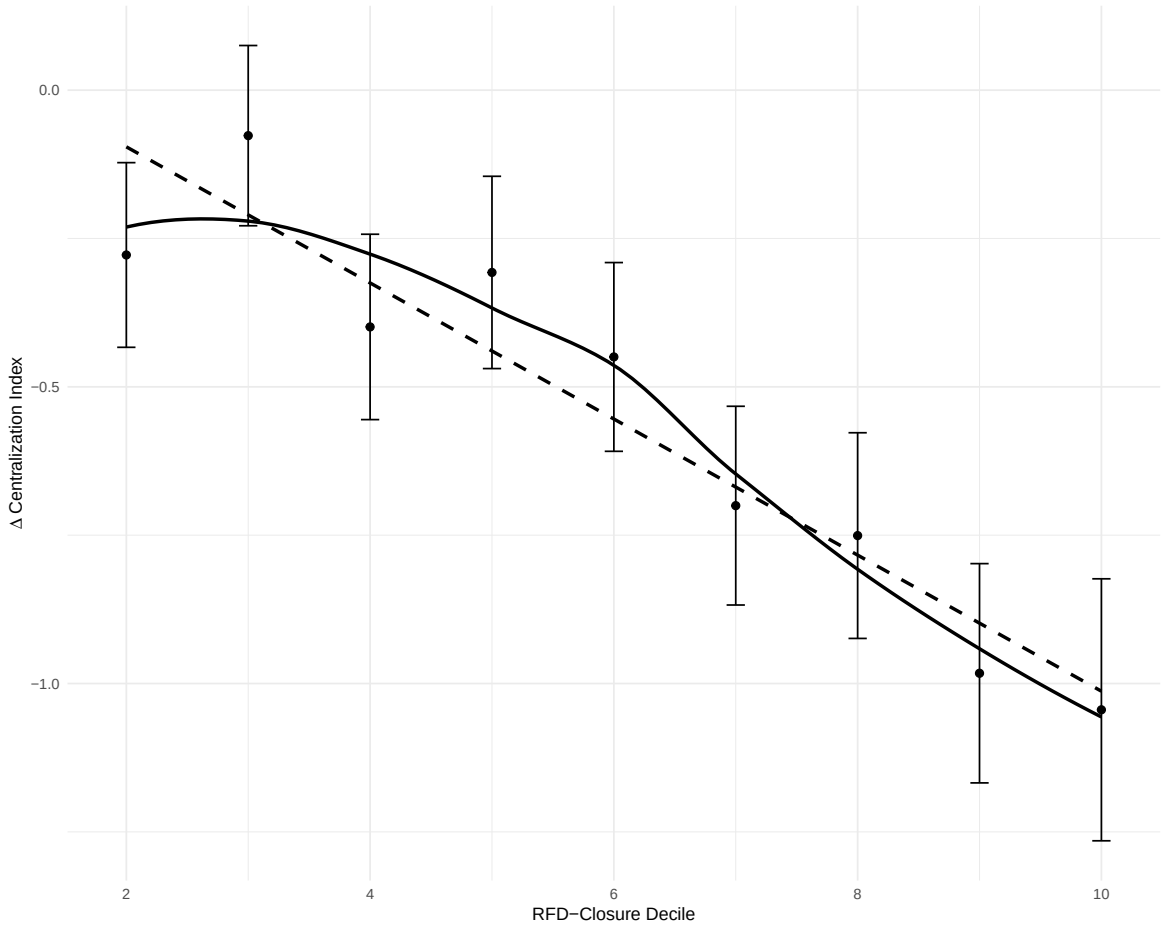
First-Stage Robustness: Geography

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First-Stage Robustness: Linearity

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Data Sources

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Centralization Index/Gov. Employment: Annual Survey of Public Employment & Payroll

Population: National Cancer Institute SEER (1977, 1987, 1997, 2007, 2017)

Private Employment: Business Dynamics Survey (same years)

Post Office Closure Instrument: Blevins and Helbock (2021)

Local Gov. Revenue: Census of Governments

Personal Income: Bureau of Economic Analysis

Data Center Locations: US Department of Energy IM3 Open Source Data Center Atlas (Mongrid et al, 2025)

Potential Threats

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Persistent Anti-Growth Preferences

- The preferences that cause more 19th century rural settlement nodes persist
- Those preferences then translate into modern anti-growth preferences (NIMBY)
- IV estimates the effect of preferences, not the effect of centralization

Decentralization is a technology to express anti-growth preferences

Persistent Polycentric Economic Organization

- Spatially dispersed metro economy; opposite of monocentric metro models
- Polycentric 19th century organization persists into a polycentric modern organization
- IV estimates the effect of polycentricity, not the effect of centralization

Local government boundaries preserve/slow reallocation of economic activity