

Reclaiming Local Control: School Finance Reforms and Housing Supply Restrictions

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AREUEA & AEA - Land Use Regulations

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**Analysis and conclusions do not represent views of FRB research staff or the Board of Governors.*

Supply restrictions have first order impacts on spatial economics:


- ▶ **House prices and affordability** (Glaeser & Gyourko (2003, 2018); Gyourko & Krimmel (2021))
- ▶ **Segregation and economic mobility** (Rothwell & Massey (2009); Trounstein (2020))
- ▶ **Declining aggregate productivity** (Hsieh & Moretti (2019); Duranton & Puga (2019))

Housing Supply Restrictions: **Clear Consequences**, Unclear Causes

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How did we get here?

- ▶ **Rising since 1970s** (Fischel (2015); Ganong & Shoag (2017); Gyourko & Molloy (2015)) 
- ▶ Explicit growth controls; not just zoning/land use laws
 - Anti-density down-zoning, Floor-Area-Ratio or height limits
 - Housing permit/population limits, urban growth boundaries

Causes/motivations of restricting new housing are not well identified

Why?

- ▶ Dearth of natural experiments
- ▶ Lack of regulation data – especially longitudinal

- ▶ Proposed mechanism:
 - Lose fiscal control over local public goods → prevent new housing development
 - Lose funding → restrict access

This Paper: Localities restrict housing to **safeguard local public goods**

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 - Lose funding → restrict access
- ▶ Test mechanism: California's 1973 school funding equalization
 - Exogenous **shock to local control** over public finance
 - **New data** on school district funding *merged* with municipal land use restrictions
 - Districts benefiting most from *local* control, enact land use restrictions after losing it.
 - New evidence confirming **persistent exclusionary effects**

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 - Districts benefiting most from *local* control, enact land use restrictions after losing it.
 - New evidence confirming **persistent exclusionary effects**
- ▶ Key themes:
 - Land use, fiscal policy, and public services are interconnected
 - Land use policy changes cast a long shadow

Local public goods: how “public” are they?

Canonical example: public schools

- ▶ “Club goods” - excludable, can be non-rival.
- ▶ Traditionally, locally funded.
- ▶ Local autonomy over property taxation allows jurisdictions to influence:
 - 1 Public good (e.g. school) quality - via local revenue
 - 2 ‘Price’ of admission - via tax burden

*This produces a range of **qualities** and **prices** in a metro area*

Intuition: Losing fiscal control exacerbates exclusionary motives

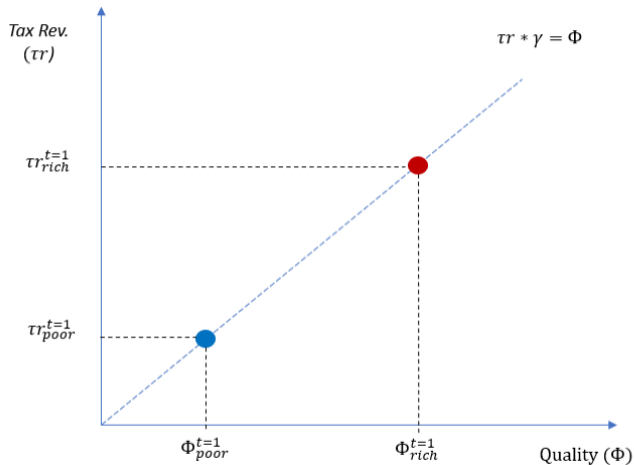
- ▶ Loss of local autonomy exacerbates market failure concerns associated with LPG provision (Ellickson, 1971; Hamilton, 1975)
 - Free riders, congestion externalities, peer effects
- ▶ Why? Localities can no longer influence:
 - 1 Public good quality via additional revenue
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- ▶ Why? Localities can no longer influence:
 - 1 Public good quality via additional revenue
 - 2 Local price of entry (tax burden) facing the market
- ▶ Jurisdictions will restrict new home development
 - No fiscal benefit, only congestion cost
 - Lose control price instruments → reclaim control using quantity instruments

Model In Pictures: Local vs. Centralized Financing

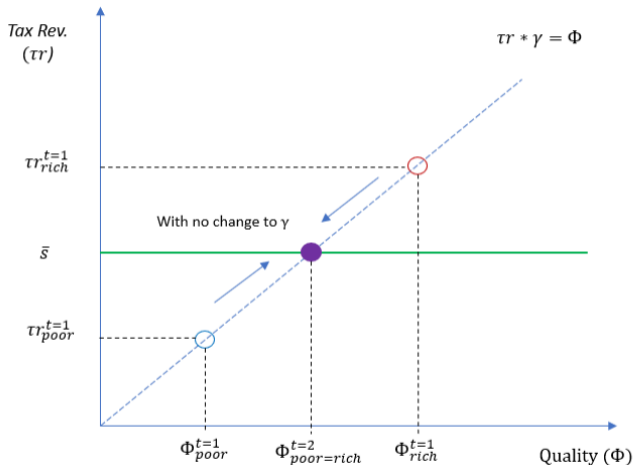
- ▶ 1 Higher income \rightarrow higher taxes \rightarrow better schools
- ▶ Diagonal dotted line - - - (Per-pupil Tax Expenditure, School Quality) set for given population density



Congestibility assumption:
for fixed per capita funding,
quality declines as pop. rises
(Wildasin, 1987)

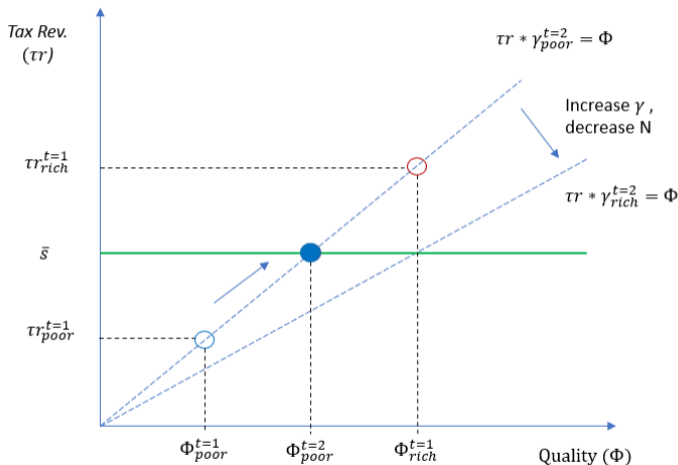
Model In Pictures: Local vs. Centralized Financing

- ▶ 2 State equalizes per-pupil spending at (\bar{s})
- ▶ *If nothing changes:* quality converges.



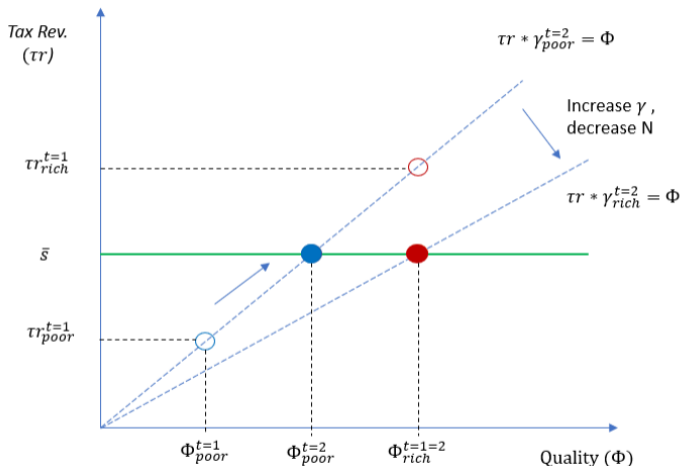
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- ▶ *If nothing changes:* quality converges.
- ▶ Facing drop in quality, rich increase land use restrictions, decrease density in long-run
- ▶ Reducing density combats congestion; maintains pre-reform level of quality Φ_{rich}



Testing the mechanism empirically

- ▶ Natural experiment: school finance equalization in California (1973 *Serrano* reforms)
 - New hand-collected school finance data, merged with panel of supply restrictions
 - Goal of reform: solve funding disparities using limits at the top, redistribution at bottom
 - Exogenous shock:
timing of court-ordered reforms and cross-sectional variation in areas affected most-least by new school finance schedule
 - Identifying variation: High-spending districts (pre-reform) became funding constrained.

▶ Identification

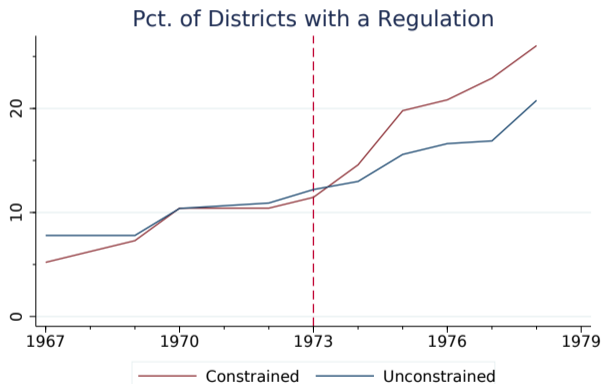
Natural Experiment: California School Finance Equalization (1973)

Local control to centralized funding

Estimation: Difference-in-Differences

- ▶ Compare *funding constrained* vs. *funding unconstrained* districts
- ▶ *Constrained*: would have spent *more* absent policy change.

▶ Regulation Maps Before vs. After



First Red Line : 1973 School Finance Reform
Data from 392 California Municipalities Incorporated By 1973

Estimation: Differential Impact of Reform on Constrained Districts

$$y_{imct} = \beta \text{Constrained}_i \times \text{Post}_t + \text{Controls}_i + \alpha_i + \lambda_t + \delta_c + \epsilon_{imct}$$

- ▶ y = Supply regulation (any regulation) (γ)
- ▶ Indexing: School district i ; Municipality m ; County c ; Time t
- ▶ **Constrained** $_i$: above 75th percentile base revenue in 1972, by district type. (where \bar{s} binds)
- ▶ **Post** $_t$: After 1973 Reform; Main sample period: 1967-1978.
- ▶ Controls:
Assessed property value per pupil, past housing units (1960), district enrollment, median income, pct. black, pct. hispanic, municipality lat-long

▶ Data

Summary of Findings

In short-run (5 years), constrained districts:

- ▶ **Were 66% (5.8 ppt) more likely to adopt a housing supply restriction.** [▶ D-i-D](#)
[▶ Event Study](#)
- ▶ Built 1% fewer homes per year [▶ Housing Stock](#)
- ▶ Saw differential house price increases of 7%
- ▶ Saw minority population drop by 17% (3.4 ppt) [▶ Prices and Race](#)

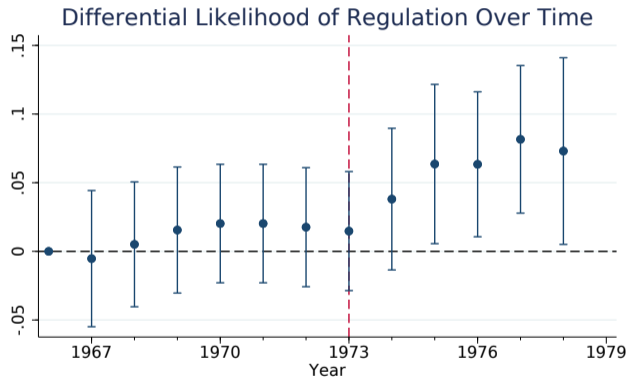
Robustness and heterogeneity : [▶ here](#)

- ▶ Not a simple story of protecting property wealth [▶ Placebo](#)
- ▶ Results driven by adoption of new anti-density zoning laws [▶ Density Restrictions](#)

In longer-run (>15 years):

- ▶ Constrained districts adopt additional restrictions
- ▶ Trends in prices and demographics persist, further widen [▶ Long-run](#)

Event Study: Adopting a housing supply restriction



Year-interacted coefficients from D-i-D
FE: District, Year, County, District Type
Bars are 95% confidence intervals
SEs clustered at county-year

Interpretation:

Pre-period sample avg: 8.8 ppt

- ▶ Post-treated mean: + 5.8 ppt
 - Implied increase: 66% more likely
- ▶ 1978 point estimate: 7.3 ppt
 - Implied increase: 83% more likely

▶ back

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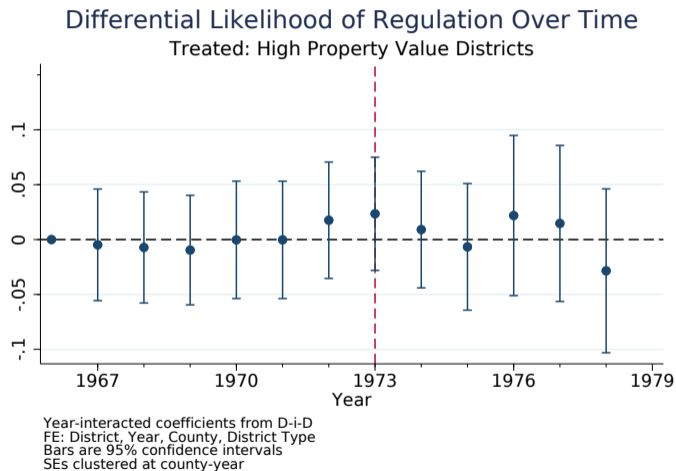
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Placebo Test: Assessed Property Value Per-Pupil



[▶ Back to main](#)

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Price and Sorting Effects Persist in the Long Run through 1990

	(1)	(2)	(3)
	(ln)House Value	Pct. Black	Pct. Hispanic
Post X Constrained	0.112*** (0.032)	-0.004 (0.003)	-0.038*** (0.011)
Observations	1660	1666	1666
R^2	0.948	0.913	0.922
Mean DV, 1970	147,000	0.02	0.15
Years	1970-1990	1970-1990	1970-1990

Standard errors in parentheses

District and Year FE, standard errors clustered at County-Year level.

Sample includes only unified and elementary districts

* $p < .10$, ** $p < .05$, *** $p < .01$

Key Finding:

Losing **fiscal autonomy** over **local public goods** causes an increase in **housing supply restrictions**

- Change to local public finance → endogenous land use response

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General Lesson:

When one public finance **instrument is removed**, agents **adjust along another**.

- Overlooked in fiscal federalism/(de)centralization debates
- Critically important if “new” instrument has distortionary effects

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Losing **fiscal autonomy** over **local public goods** causes an increase in **housing supply restrictions**

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Caveats:

Neither sole cause of supply restrictions, nor sole response to school finance reform.

Changes to fiscal policy & flexibility affect the supply side of housing market, not just demand

- ▶ **Key:** durability of housing & urban form

Unintended consequences of equity policy

- ▶ Cost-benefit analysis requires look at potential spillover effects

On the need for zoning reform:

- ▶ What carrots and sticks should states/fed gov't employ to spur local development?

Newsom passed two controversial housing bills, here's what that means for local development

Clara Harter - 3 weeks ago - development , featured , News , Newsom , sacramento , SB10 , SB9

Thank you!

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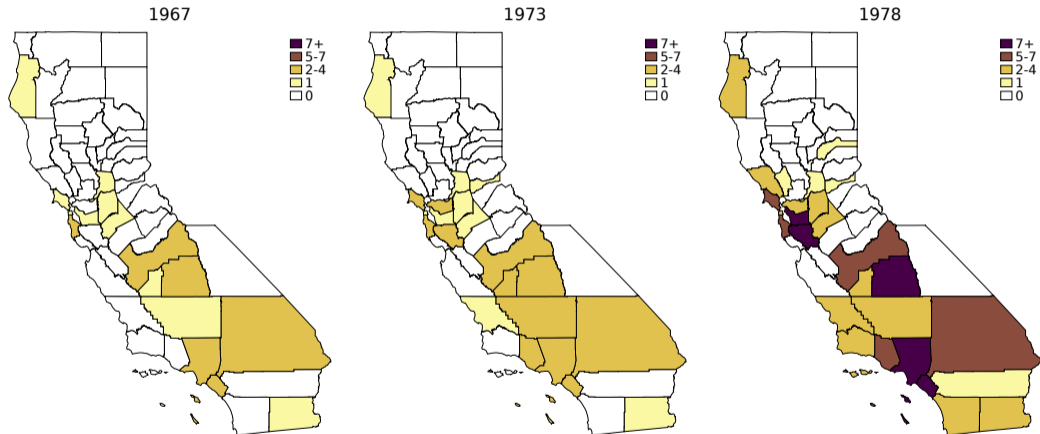
Financial and housing data for 844 school districts

- ▶ Newly digitized fiscal data from **CA Controller's Office**
 - Property tax rates, assessed property values
- ▶ Hand-collected school finance equalization data from **CA Dept. of Education**
 - Statutory revenue limits, scheduled increases
- ▶ Panel data on **municipal housing supply restrictions** (via Jackson, 2016)
 - Year of adoption, 18 restrictions, 411 cities, 1966-1992

→ *Created school district-municipality crosswalk of 472 district-city pairs*
- ▶ School district **house prices, new home construction, racial composition** (Decennial US Census, 1970-1990)

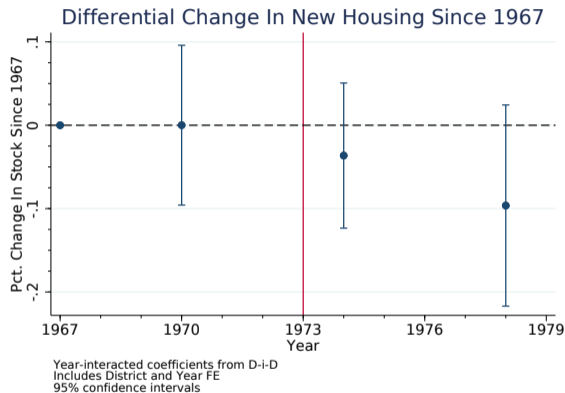
▶ [Back](#)

Cities with land use regulations, by county over time



▶ Back

Event Study: New Home Construction



Between 1970 and 1978, constrained districts built 1.2% fewer homes per year
 ≈ 140 (45) at mean (median)

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Extensions: Prices and Sorting

	(1)	(2)	(3)
	(ln)House Value	Pct. Black	Pct. Hispanic
Post X Constrained	0.068*** (0.021)	-0.005 (0.010)	-0.029*** (0.003)
Observations	1114	1118	1118
R^2	0.978	0.932	0.943
Mean DV, 1970	147,000	0.02	0.15
Years	1970-1980	1970-1980	1970-1980

Standard errors in parentheses

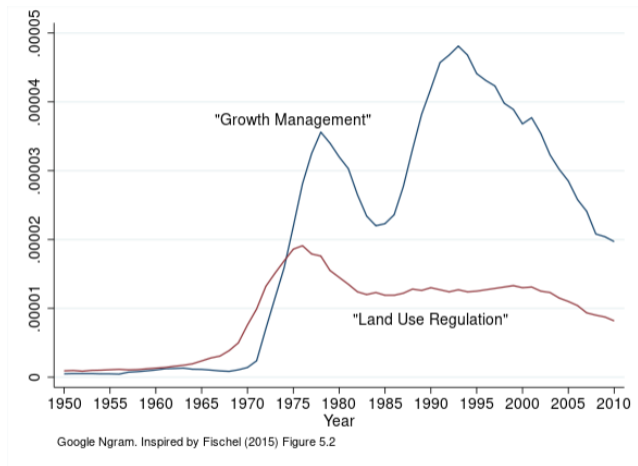
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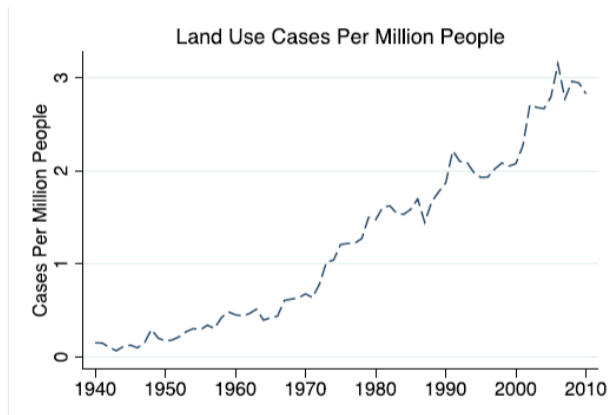
Note: 3-4 ppt = 17% effect size
Effects Persist in the Long Run ▶ 1970-1990 Results

Proxy: Google Ngram



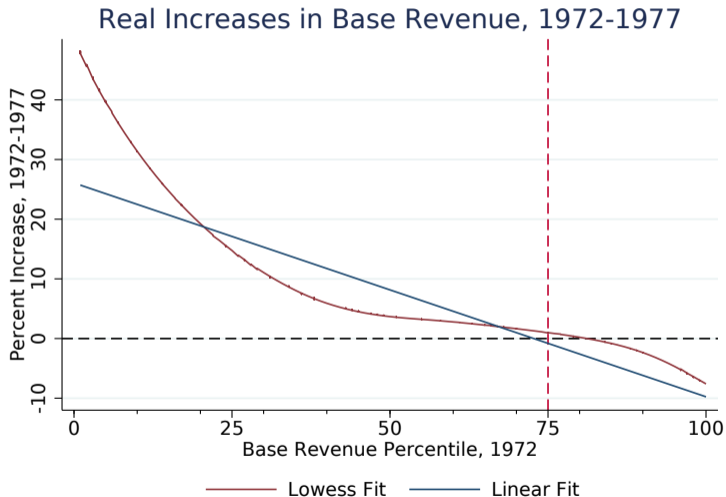
Measure by Fischel (2015) [▶ Back](#)

Proxy: Land Use Court Cases



Measure by Ganong & Shoag, 2017 [▶ Back](#)

Zero Growth Cutpoints



▶ Back

Triple Difference: Above Median Pct. College Educated

	(1) Any Reg.	(2) Any Reg.	(3) Any Reg.	(4) Any Reg.
High College X Constrained X Post	0.098** (0.039)	0.098** (0.047)	0.098*** (0.022)	0.098*** (0.022)
College X Post	0.041* (0.024)	0.041** (0.018)	0.041*** (0.012)	0.041*** (0.012)
College X Constrained	0.075*** (0.018)	0.119*** (0.028)		
High College	0.032** (0.014)	0.014 (0.015)		
Post X Constrained	-0.036 (0.027)	-0.036 (0.036)	-0.036** (0.016)	-0.036** (0.016)
Post-Reform	0.058*** (0.020)	0.058*** (0.011)	0.058*** (0.009)	
Constrained District	-0.021 (0.016)	-0.131*** (0.027)		
Observations	5447	5447	5447	5447
R ²	0.109	0.259	0.696	0.701
Mean DV, 1973	0.11	0.11	0.11	0.11
District Controls	Yes	Yes	Yes	Yes
FE	District Type	County	District	District, Year

Standard errors in parentheses

All specifications include district controls, city coordinates controls, district type FE

Standard Errors Clustered at County-Year level.

Sample includes only unified and elementary districts

* $p < .10$, ** $p < .05$, *** $p < .01$

▶ Back

Triple Difference: Above Median Pct. White

	(1)	(2)	(3)	(4)
	Any Reg.	Any Reg.	Any Reg.	Any Reg.
High White X Constrained X Post	0.067 (0.050)	0.067 (0.049)	0.067*** (0.025)	0.067*** (0.024)
High White X Post	0.028 (0.025)	0.028* (0.016)	0.028** (0.012)	0.028** (0.012)
High White X Constrained	0.008 (0.023)	0.088*** (0.024)		
High White Share	0.067*** (0.014)	0.089*** (0.013)		
Post X Constrained	0.003 (0.036)	0.003 (0.034)	0.003 (0.016)	0.003 (0.015)
Post-Reform	0.062** (0.025)	0.062*** (0.013)	0.062*** (0.011)	
Constrained District	0.036* (0.018)	-0.099*** (0.020)		
Observations	5447	5447	5447	5447
R^2	0.107	0.270	0.695	0.700
Mean DV, 1973	0.11	0.11	0.11	0.11
District Controls	Yes	Yes	Yes	Yes
FE	District Type	County	District	District, Year

Standard errors in parentheses

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Standard Errors Clustered at County-Year level.

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▶ Back

Excluding SF, LA, SD Metros

	(1)	(2)	(3)	(4)
	Any Reg	Any Reg	Any Reg	Any Reg
Post X Constrained	0.047 (0.041)	0.047 (0.046)	0.047* (0.028)	0.047* (0.026)
Post-Reform	0.088*** (0.025)	0.088*** (0.015)	0.088*** (0.014)	
Constrained District	0.012 (0.017)	-0.129*** (0.025)		
Observations	3237	3237	3237	3237
R^2	0.133	0.311	0.749	0.756
Mean DV, 1973	0.14	0.14	0.14	0.14
District Controls	Yes	Yes	Yes	Yes
FE	District Type	County	District	District, Year

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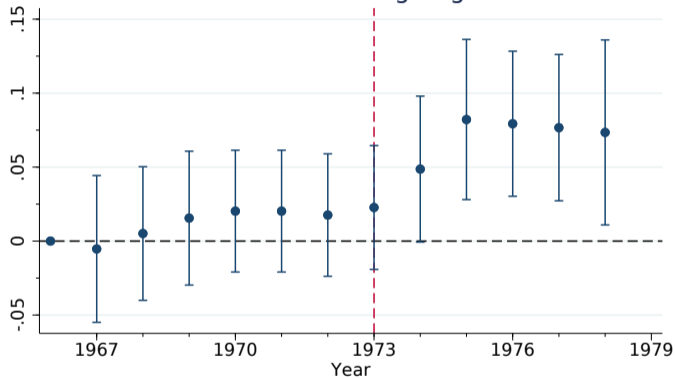
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▶ Back

Results for explicit anti-density laws

Differential Likelihood of Zoning Regulation Over Time

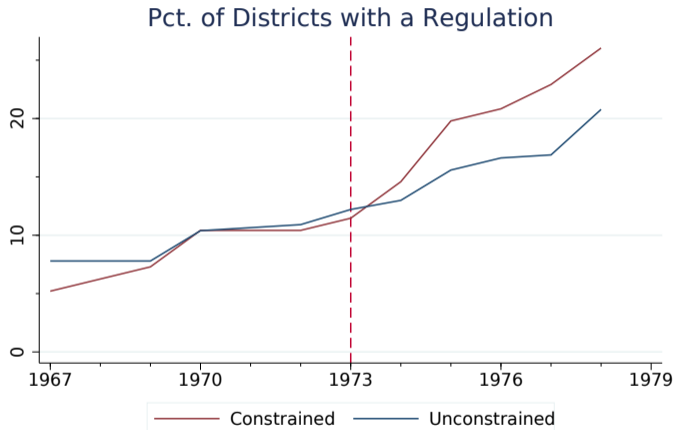


Year-interacted coefficients from D-i-D
FE: District, Year, County, District Type
Bars are 95% confidence intervals
SEs clustered at county-year

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Note: Includes residential down-zonings, FAR limits, open space requirements

No Evidence of Differential Pre-Trend



First Red Line : 1973 School Finance Reform
Data from 392 California Municipalities Incorporated By 1973

Constrained districts more likely to adopt a supply regulation after reform

	(1) Any Reg.	(2) Any Reg.	(3) Any Reg.
Post X Constrained	0.058*** (0.014)	0.058*** (0.015)	0.058** (0.025)
Post-Reform		0.074*** (0.010)	0.074*** (0.019)
Constrained District			0.039*** (0.012)
Observations	5447	5447	5447
R^2	0.699	0.693	0.098
Mean DV, 1973	0.11	0.11	0.11
District Controls	Yes	Yes	Yes
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Standard errors in parentheses

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Standard Errors Clustered at County-Year level.

Sample includes only unified and elementary districts

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Sample period: 1966-1978;
Reform in 1973

- ▶ Likelihood of any supply restriction differentially increases 5.8 ppt
- ▶ Post period associated with 7.4 ppt increase overall

▶ back

Price and Sorting Effects Persist in the Long Run

	(1) (ln)House Value	(2) Pct. Black	(3) Pct. Hispanic
Post X Constrained	0.112*** (0.032)	-0.004 (0.003)	-0.038*** (0.011)
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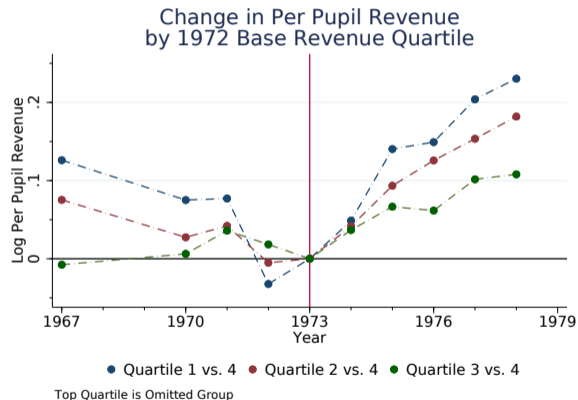
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Result: Per Pupil Revenue Increased Faster at the Bottom



Relative to top quartile
(constrained districts)

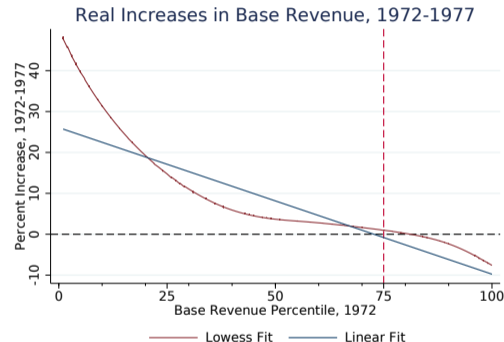
- ▶ Bottom quartile revenue increased 23%
- ▶ Second quartile: 18%
- ▶ Third quartile: 11%

▶ Back

$$PerPupilRevenue_{it} = PreReformQuartile_i \times Year_t + SchDistrict_i + Year_t + \epsilon_{it}$$

Identifying Variation: Which districts were constrained by equalization?

- ▶ Combine pre-reform fiscal data with post-reform school funding schedule
- ▶ Zero real revenue growth cut point \approx 75th percentile
- ▶ Impact of reform changes direction:
 - Real revenue increases below
 - Real revenue decreases above
- ▶ **Due to exogenous per-pupil funding schedule, not endogenous response**



Heterogeneity and Robustness

Robust to alternative mechanisms:

- ▶ Not a story of just protecting property wealth [▶ Placebo](#)
- ▶ Results not driven by high-priced coastal metros [▶ Excluding SF, LA, SD](#)

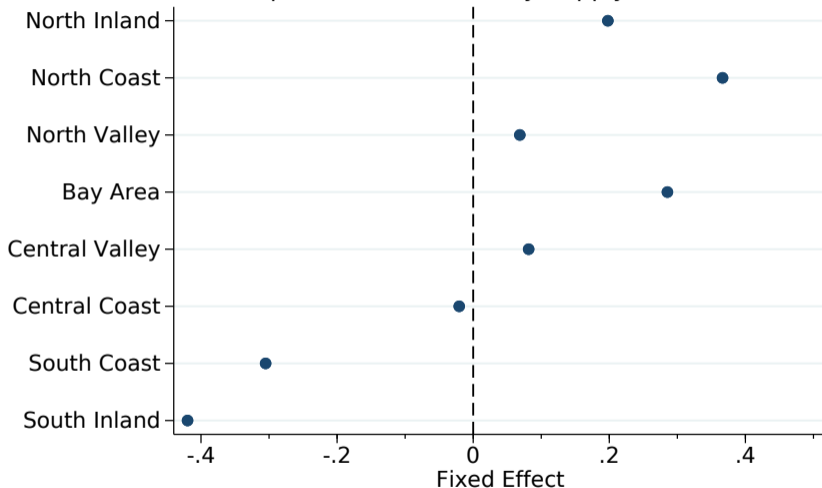
Results amplified by peer/racial effects:

- ▶ Pct. College Educated Triple Difference [▶ College](#)
- ▶ Pct. White Triple Difference [▶ White](#)

[▶ back](#)

Estimated Region Fixed Effects

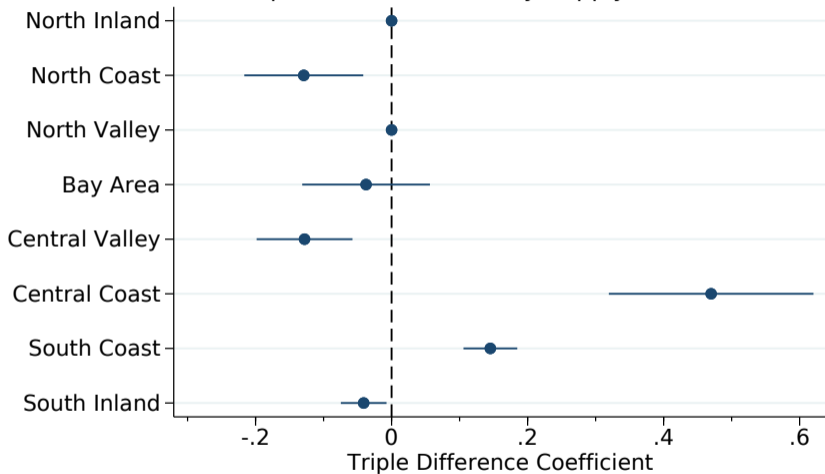
Dependent Variable: Any Supply Restriction



From Baseline Specification

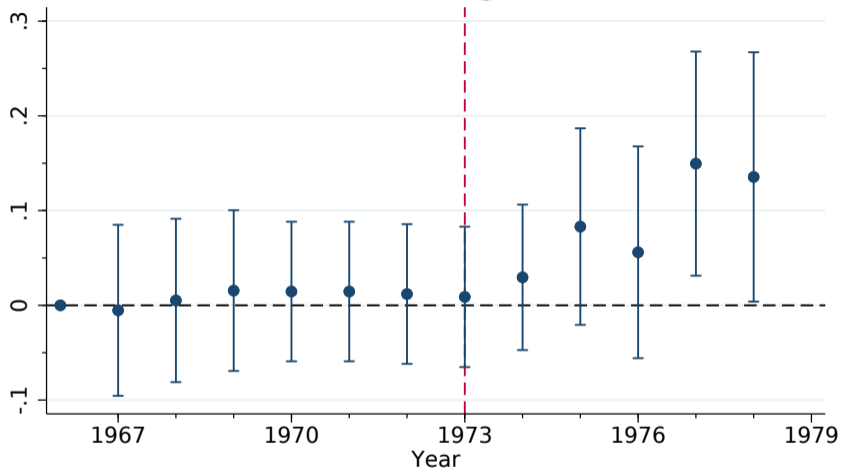
Differential Treatment Effects by Region

Dependent Variable: Any Supply Restriction



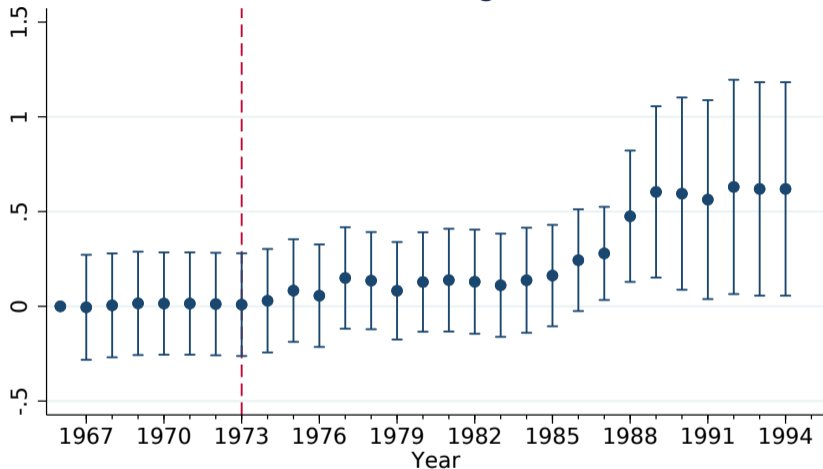
From Triple Difference Regression Interacting Post X Treat X Region
Omitted Region is North Inland

Differential Number of Regulations Over Time



Year-interacted coefficients from D-i-D
FE: District, Year, County, District Type
Dashed lines represent 95% confidence intervals
SEs clustered at county-year

Differential Number of Regulations Over Time



Year-interacted coefficients from D-i-D
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