The Far-reaching Impact of Land Inequality: Evidence from U.S. Counties

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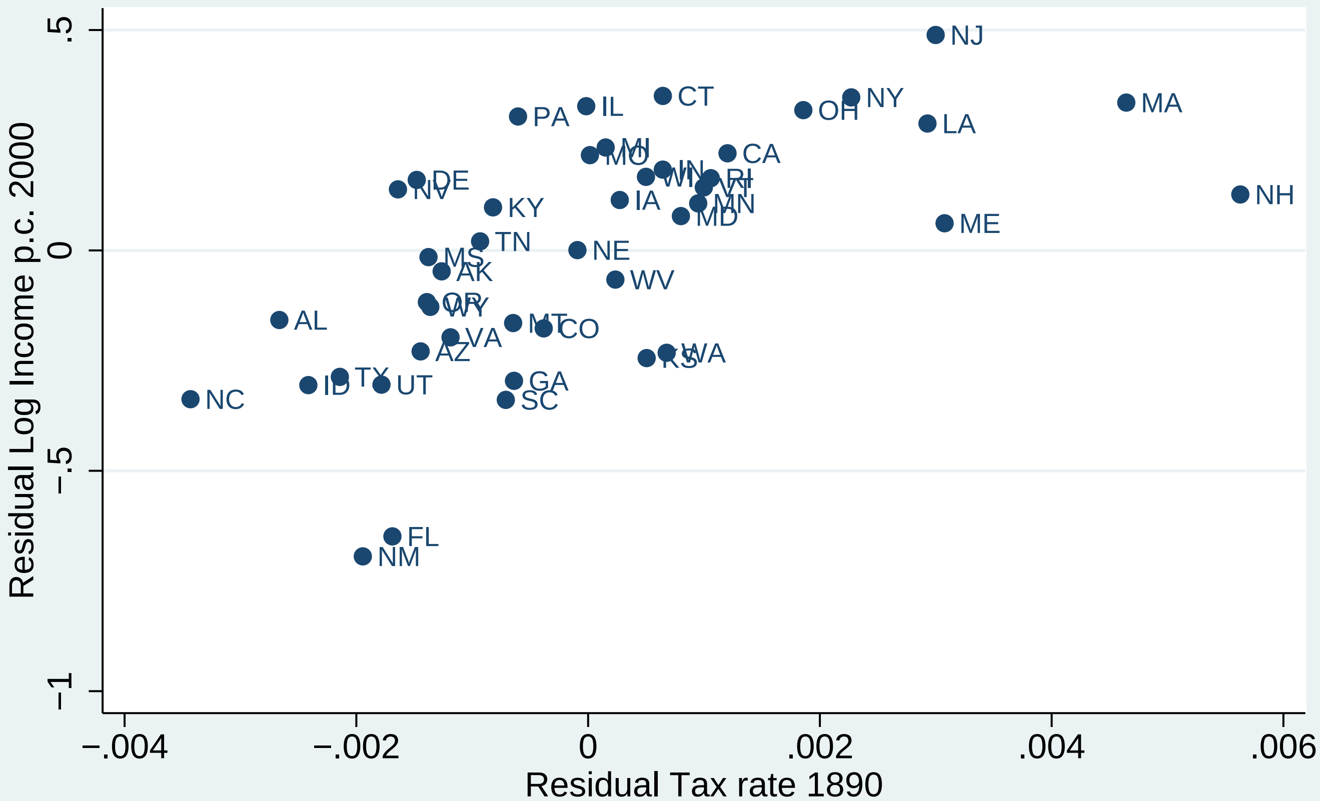
Public Goods

U.S. industrialization from 1860–1930

- Coincides with massive public goods expansion
  - Schools (universal secondary)
  - Roads
  - Urban services (sewer, power)
- From heavily agricultural to mainly industrial economy
- Correlation of places with high public spending and future growth within the U.S.

Taxation and Future Income Per Capita



Note: Plot shows the residual relationship between log income per capita in 2000 and the effective property tax rate on wealth in 1890, controlling for log wealth per capita in 1890. Income per capita data is from Baier et al, and property tax and wealth data are author's calculations from the U.S. Census report of 1895.

Property Taxation

Public finances in 1890 depended on property taxation

- 92% of local revenues
- 72% of state revenues

But revenues not uniform across counties

- \$0.08 per person in Georgia
- \$5.00 per person in Iowa, Kansas, Wisconsin

Not only a wealth issue

- 0.2% tax rate in South
- 1.5% tax rate in Midwest

Explaining Variation

Property tax is a wealth tax:

- Farm land was 60% of wealth in 1890
- Distribution of farm land (and wealth?) relevant for taxation

Theoretically, what do we expect?

- Alesina and Rodrik (1994) - inequality $\Rightarrow$ higher taxes
- Galor et al (2009) - inequality $\Rightarrow$ lower (education) taxes

Is there a relationship of land distribution and public goods funding? If so, what direction does it go?

Wealth and Tax Data

Census report on *Wealth, Debt, and Taxation (1895)* provides county-level data:

- Total property tax revenues collected in a county
- Property tax revenues explicitly collected for schooling
- Total assessed value of all property (real and personal)
- Imputed “true” value of real property

Inequality Data

Agricultural Census of 1890 provides:

- Size distribution of farms (10-19 acres, 20-49 acres, etc..)
- Operational distribution
- Count of males aged 21 or more
- Count of population in urban areas (> 2500)

Several issues in using this data

- Size, not value (Soltow, 1975: not a large difference)
- Ownership $\neq$ operational (Soltow, 1975: not a large difference)
- Adjust farm size Gini by farm/male ratio
- Lack of data on non-farm wealth - look only at rural counties

Summary Statistics

Across regions:

	Region: New England	Mid Atl.	East N. Cent.	West N. Cent.	South Atl.	East S. Cent.	West S. Cent.
Local Sch. Tax p.c.	1.78	1.53	2.07	2.83	0.39	0.30	0.45
R.E. Val p.c. ($th)	0.53	0.59	0.62	0.63	0.24	0.22	0.18
Assd. Val p.c. ($th)	0.57	0.41	0.35	0.30	0.18	0.18	0.15
Farm Gini (G)	0.45	0.45	0.41	0.26	0.52	0.49	0.51
Adj. Gini (G^A)	0.86	0.87	0.79	0.62	0.77	0.73	0.75
Observations	67	148	427	547	473	341	121

Specifications

Baseline regressions are

$$(T/L)_{ij} = \alpha + \beta G_{ij} + \gamma \ln W_{ij} + \delta X_{ij} + w_j + \epsilon_{ij} \tag{1}$$

where

- T/L_{ij} is tax revenues per capita
- G_{ij} is Gini coefficient
- W_{ij} is wealth (assessed and/or true values)
- X_{ij} are controls (% child, % urban, % black, total pop.)

Instruments

Omitted variables, measurement error, reverse causality are problems for inequality:

- Geographic instruments
- GEOECOLOGY database (Olson et al, 2003)
- Rainfall, temperature, growing period, latitude
- First stage is generally strong
- IV's excludable? Sargan test, inclusion of X_{ij}

Results

	Dep. variable is local school tax revenues per capita:					
	(1)	(2)	(3)	(4)	(5)	(6)
	All Counties	Rural Only	All Counties	Rural Only	All Counties	Rural Only
Farm Gini (G)	-9.607***	-9.222***				
	(3.170)	(3.328)				
Adj. Gini (G^A)			-7.822***	-7.048***	-7.306***	-6.603***
			(2.208)	(2.429)	(2.009)	(2.180)

Implications

Strong negative result

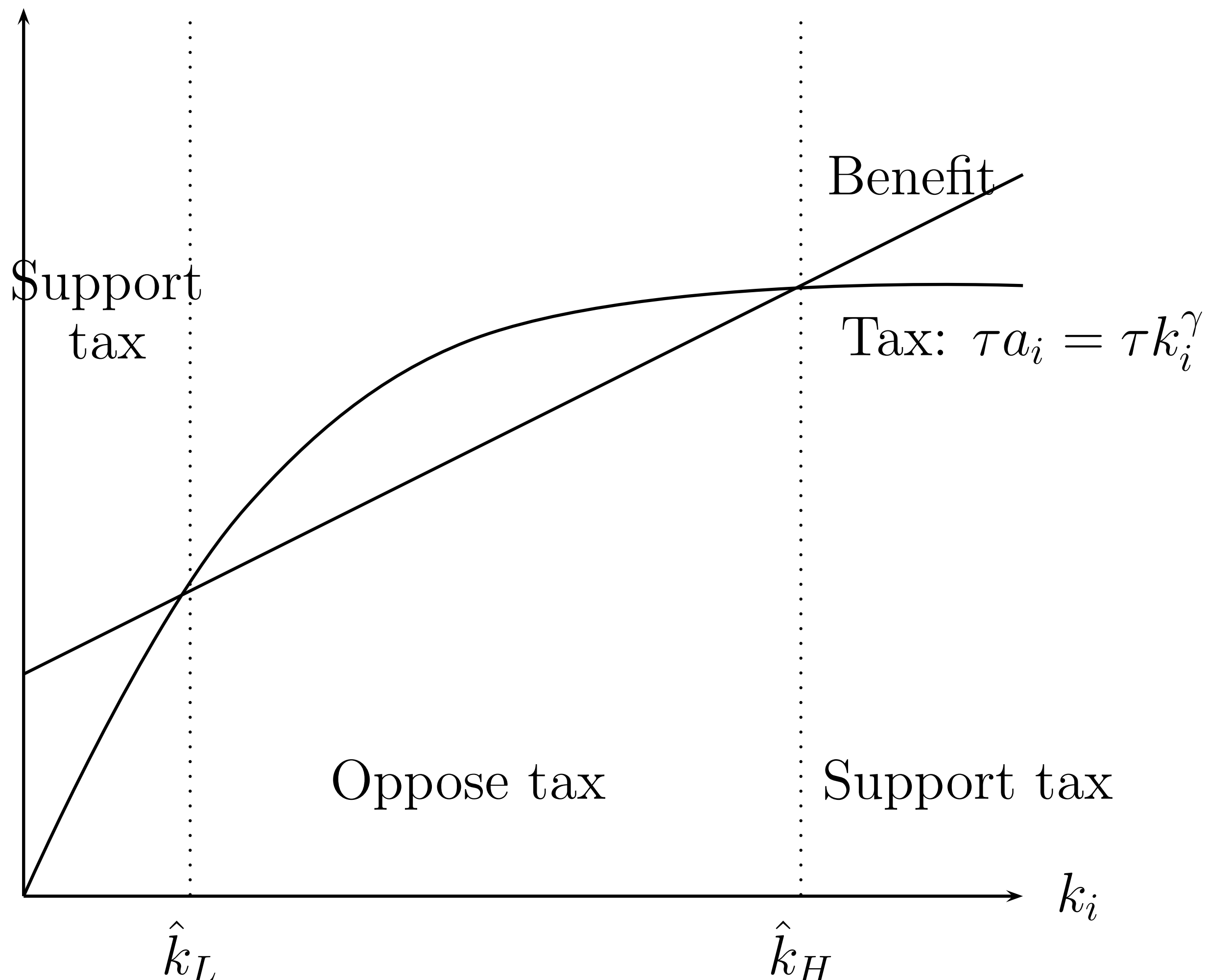
- Mean school revenues per capita: \$1.46
- Increase Gini from 25th-75th percentile (0.16): -\$1.16 in revenues
- Negative sign $\Rightarrow$ median voter theory wrong?
- Establishes relationship of land inequality to poor long-run outcomes?

Assessment Process

Before making conclusions:

- Recognize nature of assessment process
- Assessment rates declining with wealth (Leland, 1928; Seligman, 1895; Fisher, 1996)
- Constant tax rate on assessed property value
- Effective tax rate on property declines with wealth

Median Voters



Results

	Dep. variable is local school tax revenues per capita:					
	(3)	(4)	(5)	(6)	(7)	(8)
	Adj. Gini in:					
	Bottom 10%	Bottom 25%	Bottom 50%	Top 50%	Top 25%	Top 10%
Adj. Gini	-1.189	-9.344***	-9.568***	1.992	2.416	7.002***
	(9.171)	(3.485)	(2.489)	(2.138)	(2.217)	(2.657)
OLS Est.						
Adj. Gini	0.406	-2.485**	-3.429**	1.804**	2.314***	5.047***
	(1.567)	(1.135)	(1.278)	(0.873)	(0.822)	(1.766)

Conclusion

Land distribution in a developing economy:

- Influences public goods provision given a wealth tax
- In particular, education spending is responsive
- Size of effect is very large
- Sign of effect depends on level of inequality
  - For low inequality, increase in inequality lowers revenues
  - For high inequality, increase in inequality raises revenues
- Structure of assessment/tax system matters
- Tax system is endogenous - does distribution affect this?