

Convergence and Divergence: The Link between Spatial Labor Market Disparities and Educational Attainment

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Education and Educational Institutions in Spatial Markets

Today's Objectives:

1. *Descriptive*: How has the geographic inequality in education changed over time?
2. *Causal*: How do labor market shocks impact educational outcomes?
 - Labor market shifts affect demand for education
 - Local labor market outcomes affect state and local resources to pay for educational services



Theoretical ambiguity motivates empirical work

Big empirical takeaways

- Overall, convergence at the high school level has been substantial in recent decades but this has not produced convergence in college degree completion
- Adverse local labor market shocks lead to:
 - Increased secondary school participation; young people stay in school longer
 - Growth in college enrollment, particularly for women
 - Little change in college degree attainment
 - Declines in local elementary-secondary expenditures
 - Declines in state support for higher education

Research Preliminaries

Question of unit of analysis

Education markets and labor markets are not identical

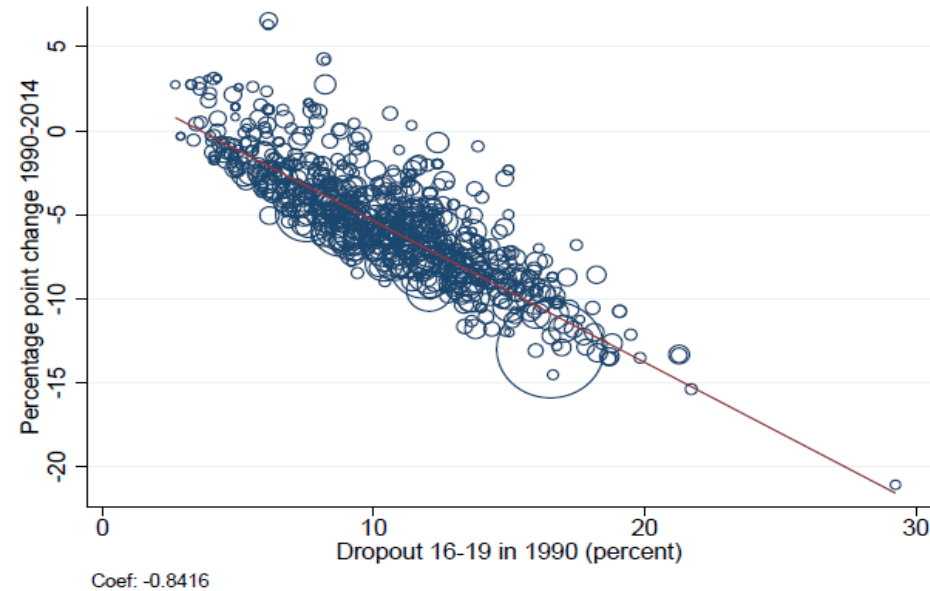
- Labor market – “Commuting zone”
- School districts (K-12)
- States

Describing Convergence & Divergence

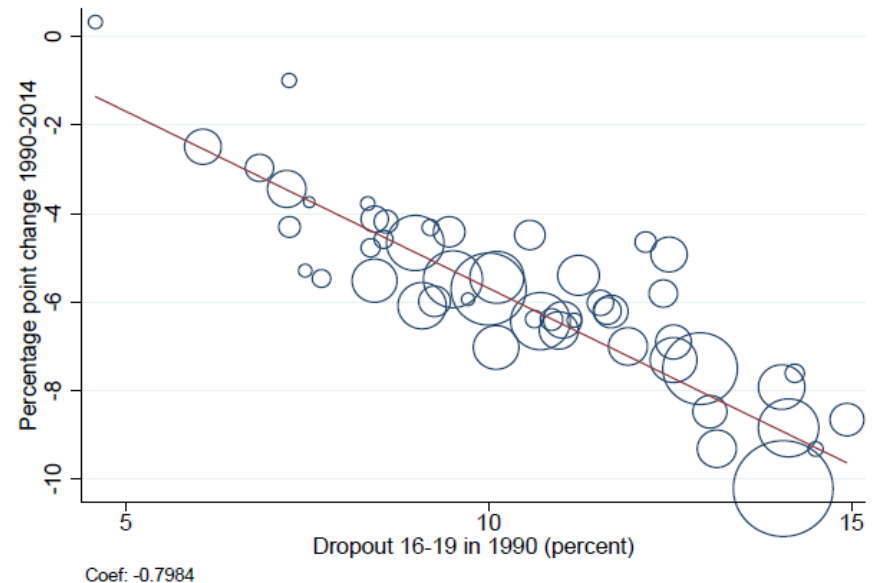
- Data
 - ACS/Census
 - Common Core
 - IPEDS
- Measures
 - School persistence, Drop out
 - High school degree
 - College enrollment
 - College degree
 - School and college resources

High School Dropouts, Ages 16-19

Commuting Zone

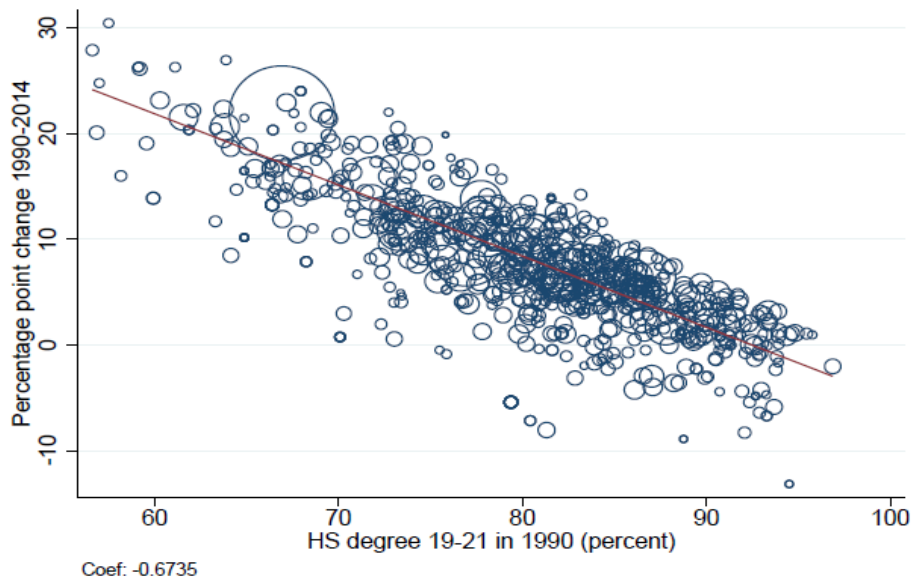


State

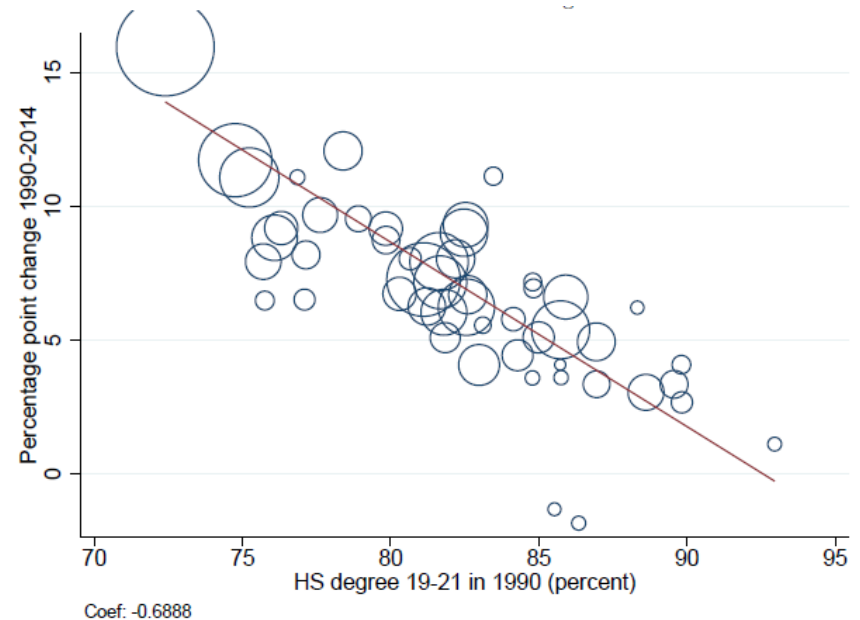


High School Degree Receipt, Ages 19-21

Commuting Zone

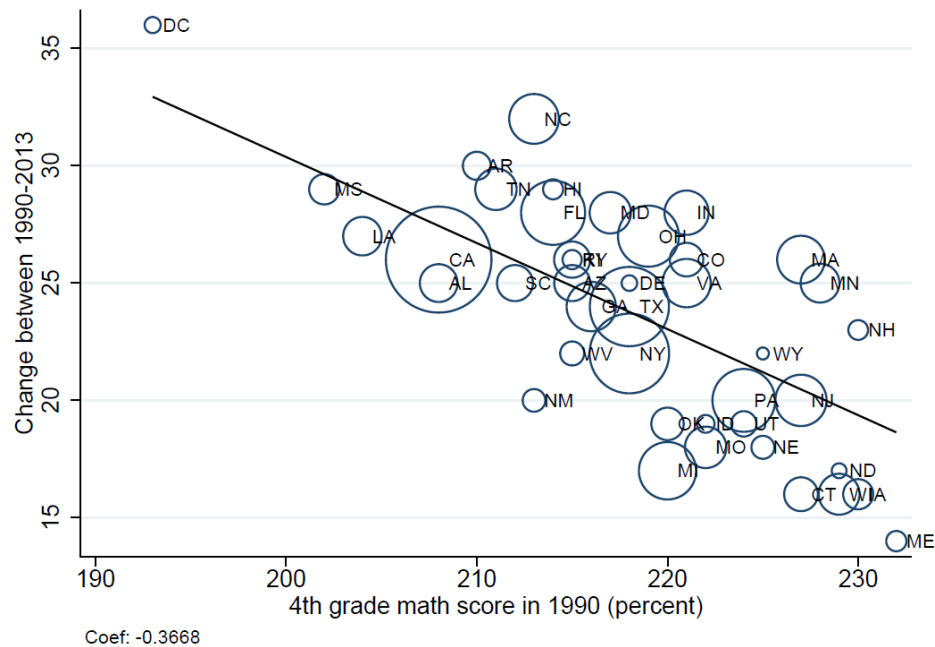


State

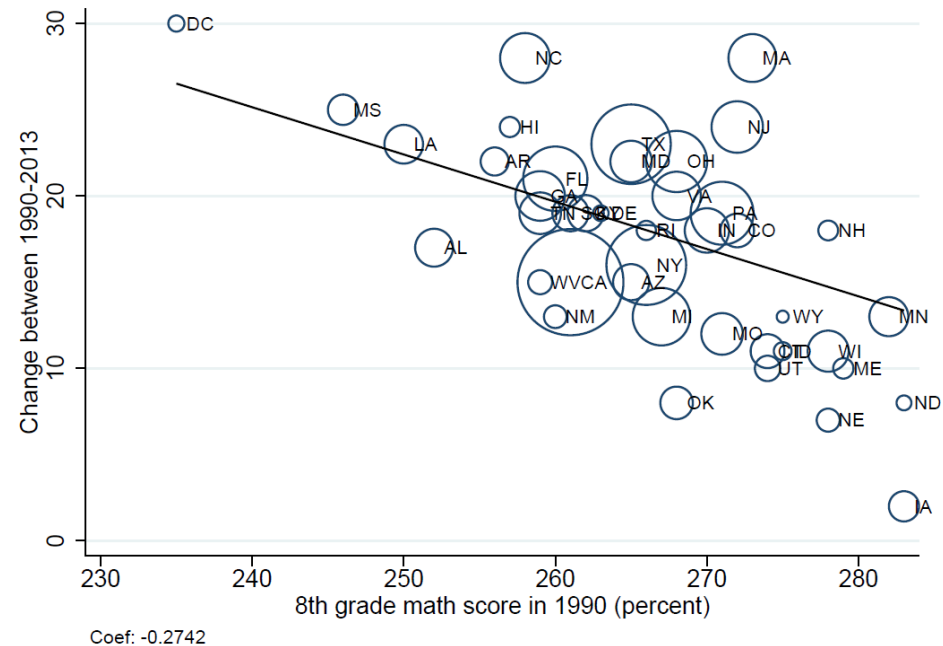


NAEP Test Scores

4th grade

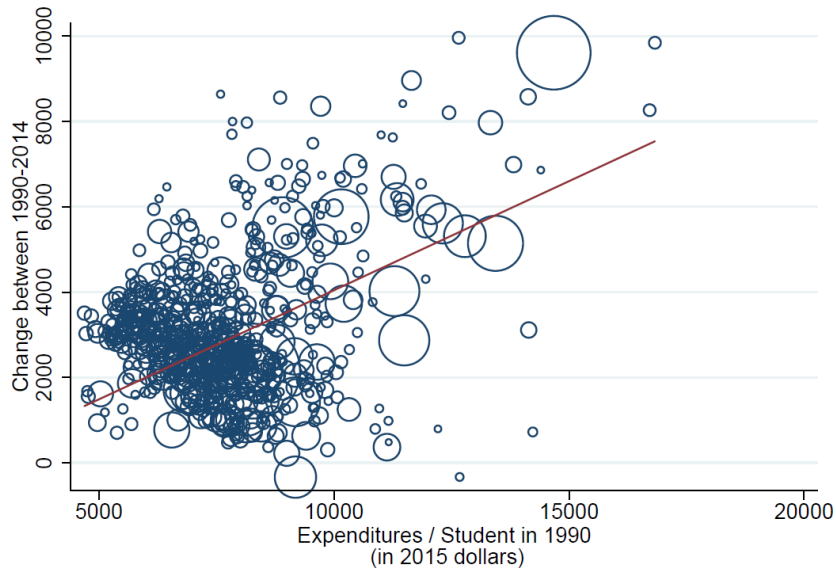


8th grade



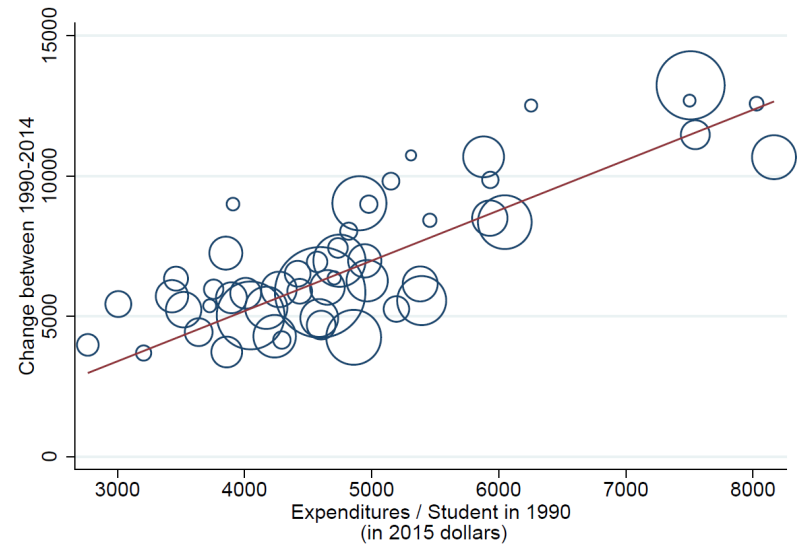
Expenditures Per Student, K-12

Commuting Zone



Coef: 0.5114

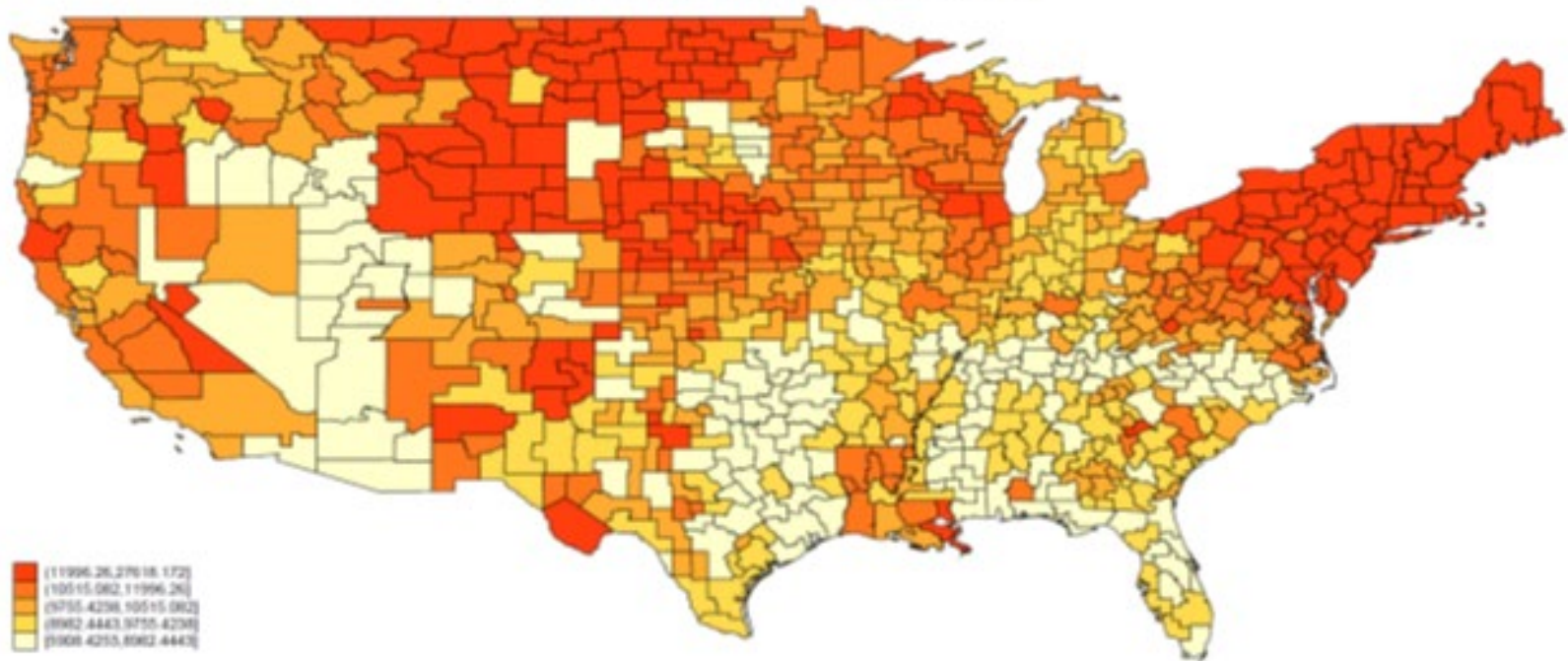
State



Coef: 1.7922

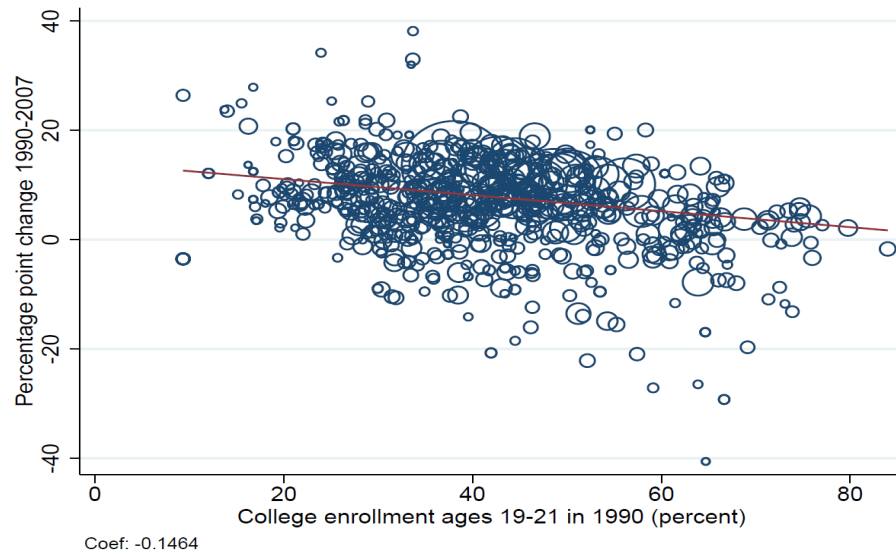
Geography of K-12 Expenditures per Student

Expenditure per student in 2014

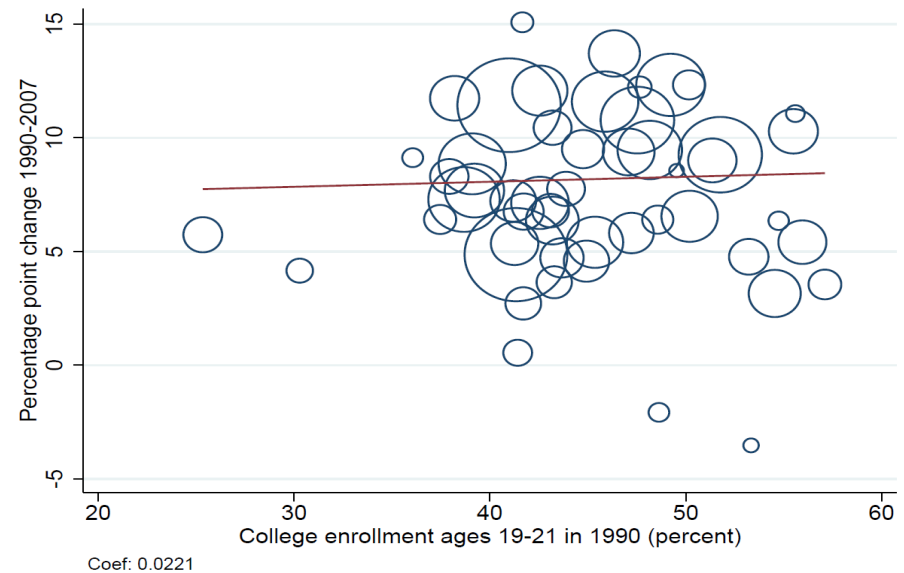


College Enrollment, 1990-2007

Commuting Zone

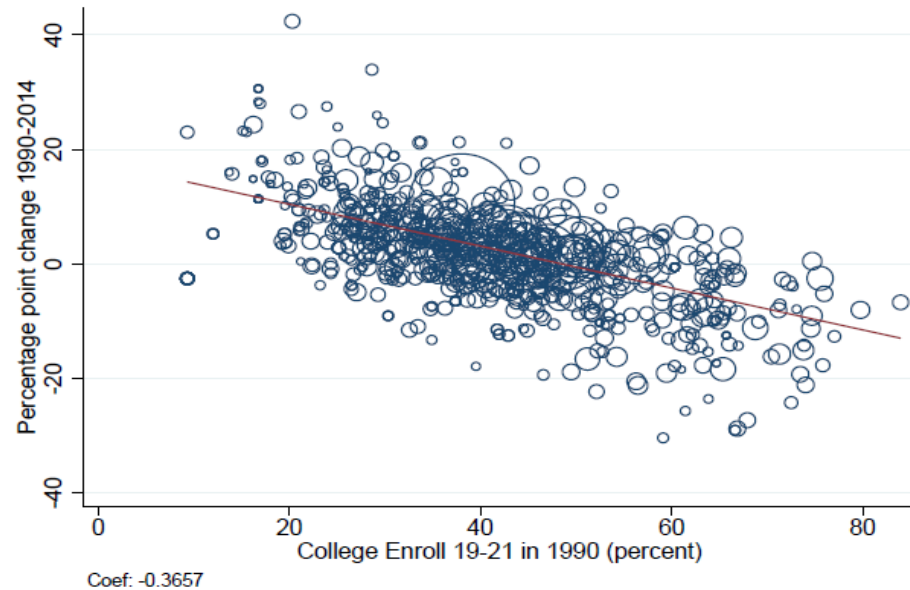


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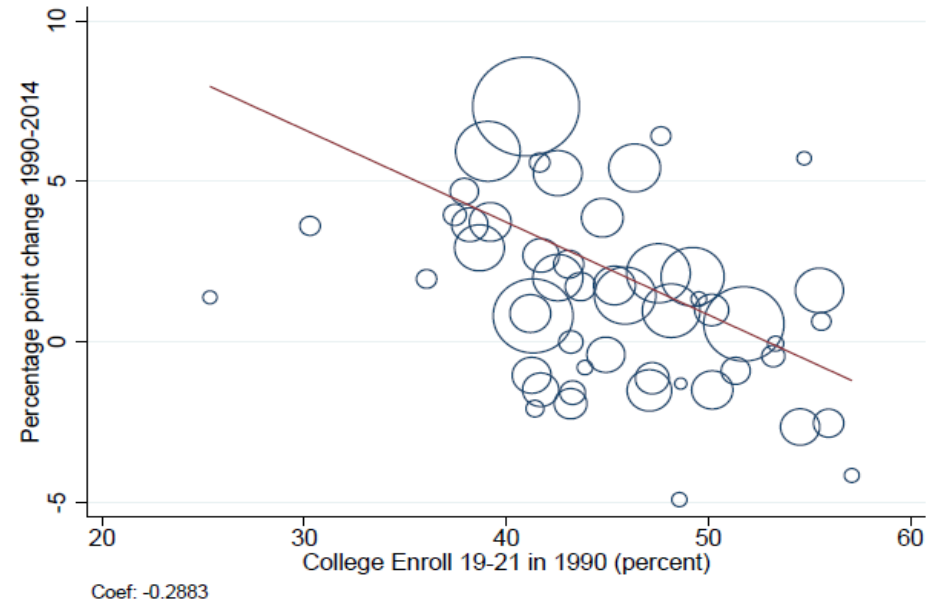


College Enrollment, 1990-2014

Commuting Zone

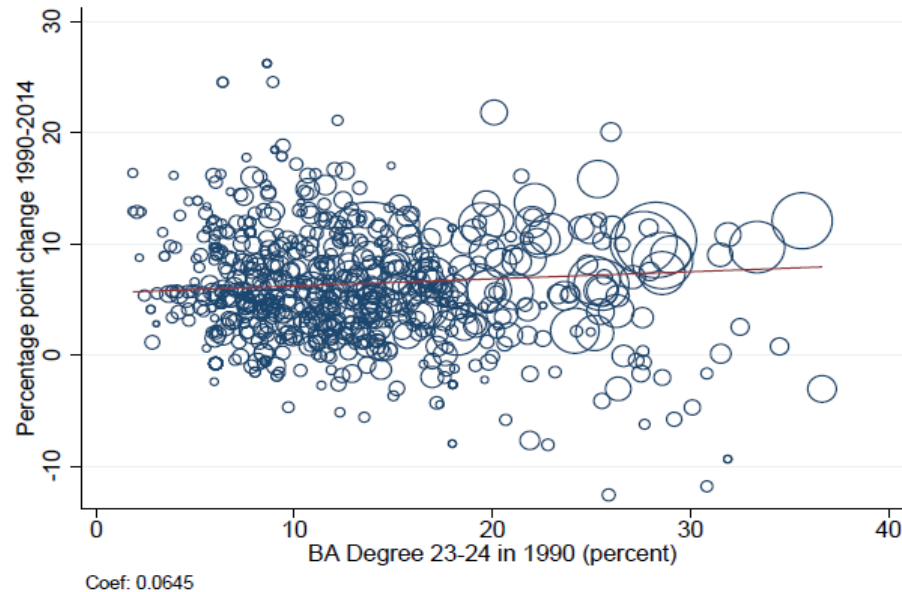


State

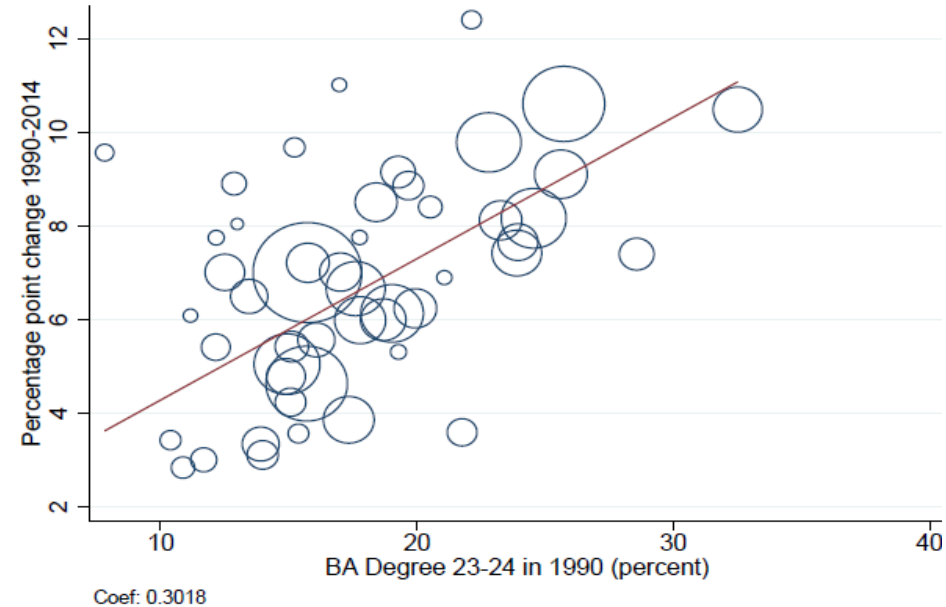


BA Degree Attainment, Ages 23-24

Commuting Zone

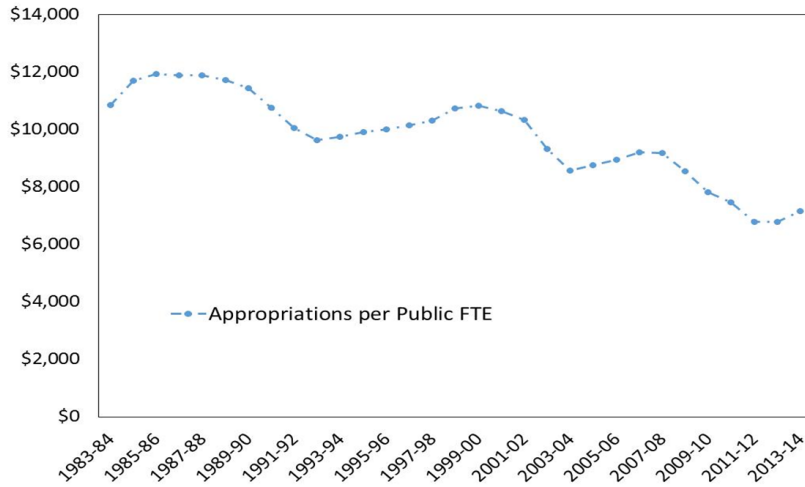


State

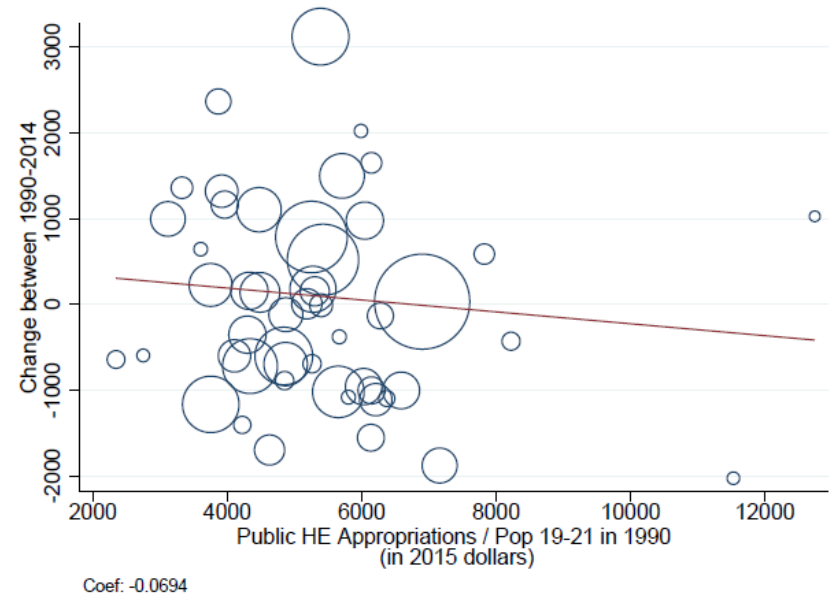


State Higher Education Funding

Aggregate Per Student Trend

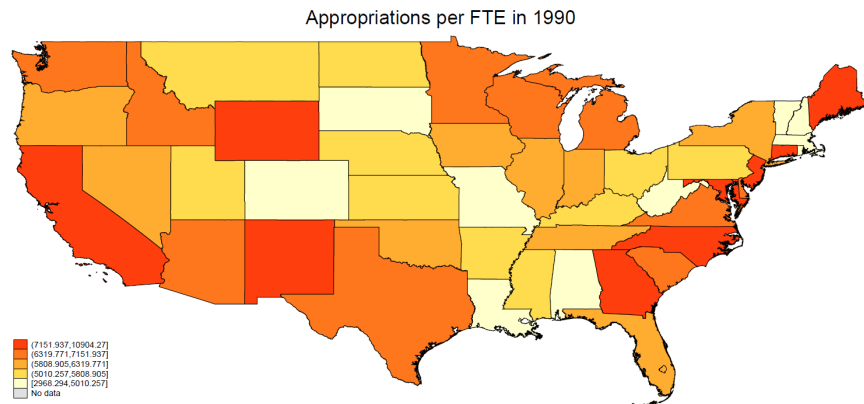


Variation among States

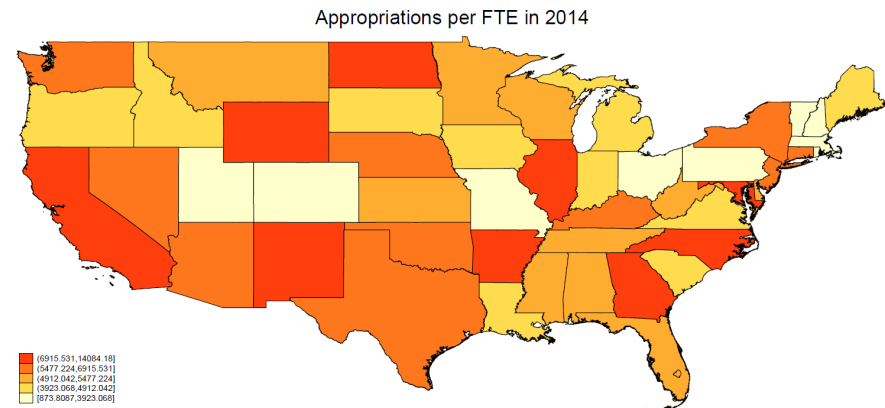


Winners and Losers in State HE Funding

1990



2014



Research Context

Question of *this analysis*: Educational outcomes for youth at the time of local labor market disruptions

Related questions:

- Educational participation of displaced workers and un(under)employed
- Educational participation of kids of unemployed / displaced

Primary Specification

$$\Delta E_{it} = \gamma_t + \beta_1 \Delta IPW_{uit} + X'_{it} \beta_2 + e_{it}$$

ΔE_{it} Change in education measure for CZ i

ΔIPW_{uit} Import exposure measure based on Autor, Dorn & Hanson (2013)

X_{it} Start of period measures including local demographics and baseline manufacturing shares

Estimation and Identification

Chinese import penetration measure is constructed to reflect the change in U.S. imports of Chinese goods per worker in a local area

$$\Delta IPW_{uit} = \sum_j \frac{L_{ijt}}{L_{ujt}} \frac{\Delta M_{ucjt}}{L_{it}}$$

where L represents start of period employment and ΔM is the overall change in the value of U.S. imports from China, with i indicating commuting zone, j indicating industry, and t indicating time period.

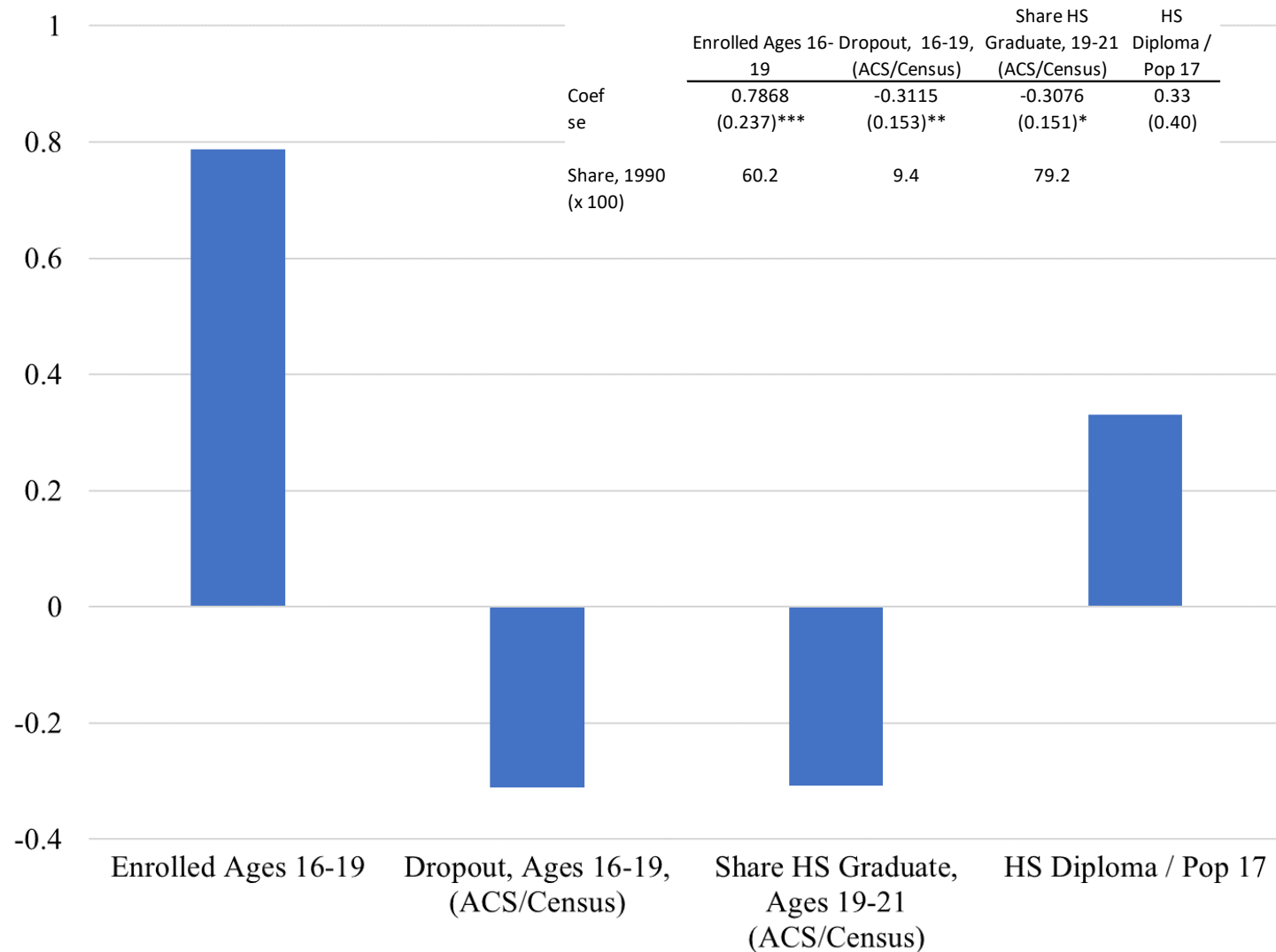
Following Autor, Dorn and Hanson (2013), instrument the imports measure with a measure based on lagged employment shares and the change in the value of imports to other high-income countries

Effect of Local Change in Import Exposure on School Enrollment Ages 16-19

Dependent Variable: Share Enrolled in School Ages 16-19, (x100)

VARIABLES	(1)	(2)	(3)	(4)
(Δ imports from China to US)/worker	0.3874 (0.101)***	0.7868 (0.237)***		0.7482 (0.243)***
State (Δ imports fr Ch to US)/worker			1.1004 (0.445)**	
State-j (Δ imports fr Ch to US)/worker				0.2882 (0.436)
Observations	1,444	1,444	1,444	1,440
R-squared	0.577	0.593	0.604	0.588
Full Set of Locality Covariates	N	Y	Y	Y

Secondary Education Coefficients



Complexity of HS Attainment Results

Why?

- Achievement barriers
 - Staying in school easier than graduation
- Outmigration
 - Pop (19-20/16-17) declines 1.4% per \$1k exposure
- Military enlistment
 - 1 pp increase in mass layoffs → 2.8% ↑ enlistments

K-12 Expenditures per Student

Dependent Variable: K-12 Expenditures per Student

VARIABLES	(1)	(2)	(3)	(4)
(Δ imports from China to US)/worker	-137.8398 (92.250)	-299.6259 (115.583)***		-316.0822 (125.658)**
State (Δ imports fr Ch to US)/worker			-653.1794 (251.224)***	
State-j (Δ imports fr Ch to US)/worker				-78.2226 (225.684)
Observations	1,444	1,444	1,444	1,440
R-squared	0.111	0.358	0.409	0.367
Full Set of Locality Covariates	No	Yes	Yes	Yes

Effect of Local Change in Import Exposure on College Enrollment

	College Enroll, 19-21	College Enroll, 22-23	College Enroll, 19-21	
			Men	Women
(Δ imports from China to US)/worker	0.5414 (0.249)**	0.8949 (0.353)**	0.1619 (0.2610)	0.9375 (0.322)**
Observations	1,444	1,444	1,444	626
R-squared	0.556	0.194	0.593	0.077
Full Set of Locality Covariates	Y	Y	Y	Y

Effect of Local Change in Import Exposure on BA Degree Attainment, CZ Level

	BA Degree		
	23-24	25-26	25-29
(Δ imports from China to US)/worker	0.2225 (0.171)	-0.0588 (0.224)	-0.0922 (0.180)
Observations	1,444	1,444	1,444
R-squared	0.226	0.287	0.398
Full Set of Locality Covariates	Y	Y	Y

Post-Secondary Attainment & Resources

State-Level Effects

	ACS/Census	IPEDS	State Funding Measures	
	Ages, 25-29	Ln BA	Ln Appropri.	Ln App per FTE
Δ imports from China to US)/worker	-0.0186 (0.019)	-0.0258 (0.015)*	-0.1527 (0.060)**	-0.1260 (0.056)**
Observations	96	96	96	96
R-squared	0.781	0.657	0.345	0.263
Census division dummies	Yes	Yes	Yes	Yes

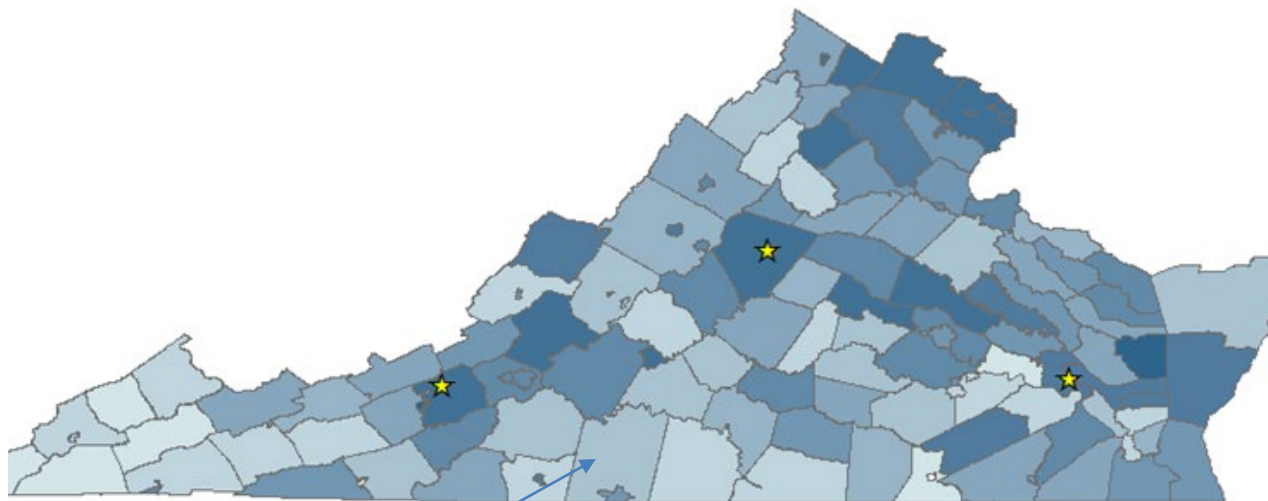
Regressions include full covariates at state level.

Why Limited Degree Receipt?

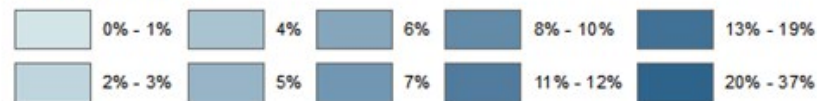
1. Preparation / achievement
 - Potential declines in college preparation
2. Declining resources to public universities
3. College choice
 - Limited access to highest graduation rate institutions

College Choice Conjecture

Enrollment in UVA, VT, or W&M



Enrollment Rate



Districts most affected by trade shocks least likely to send students to most resource-intensive colleges

Takeaways

- 1) High school attainment
 - Overall convergence and increased attainment among trade impacted *despite falling* school resources
- 2) College enrollment
 - Notable effects, particularly for women
- 3) College degree effects: None
- 4) Resource effects for schools and colleges

Unanswered questions

- K-12: Achievement effects
- Post-secondary choices
 - College choice: 2-year, 4-year and measures of institutional quality
 - Who leaves the CZ and the state?
 - Military enlistment
 - Differences by gender

Bigger Picture and Public Policy

- Stubborn challenge: Gains in college participation do not regularly lead to gains in degree attainment
 - Why? Weak academic preparation, poorly informed college choice, limited institutional resources
- Costs from trade: Accrue to communities and public institutions not just job losers; education can only be a lever of mobility with broadly accommodating resource policies