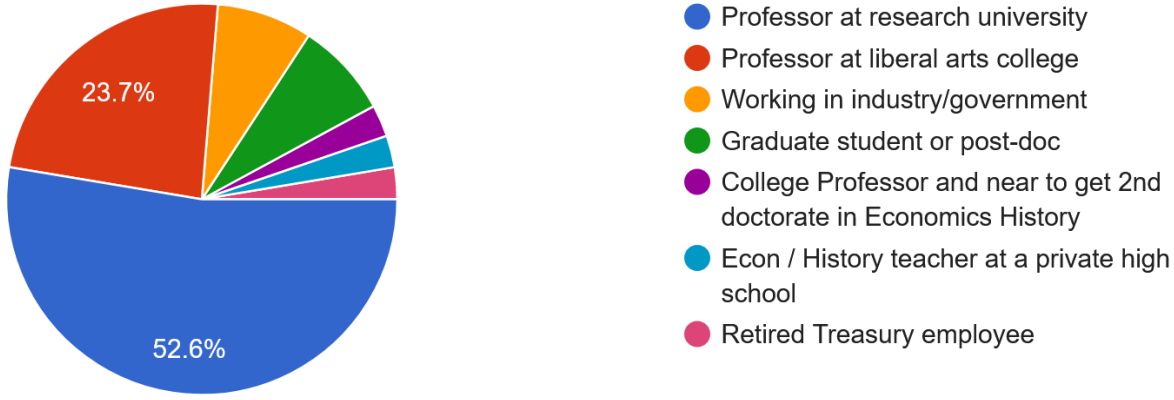
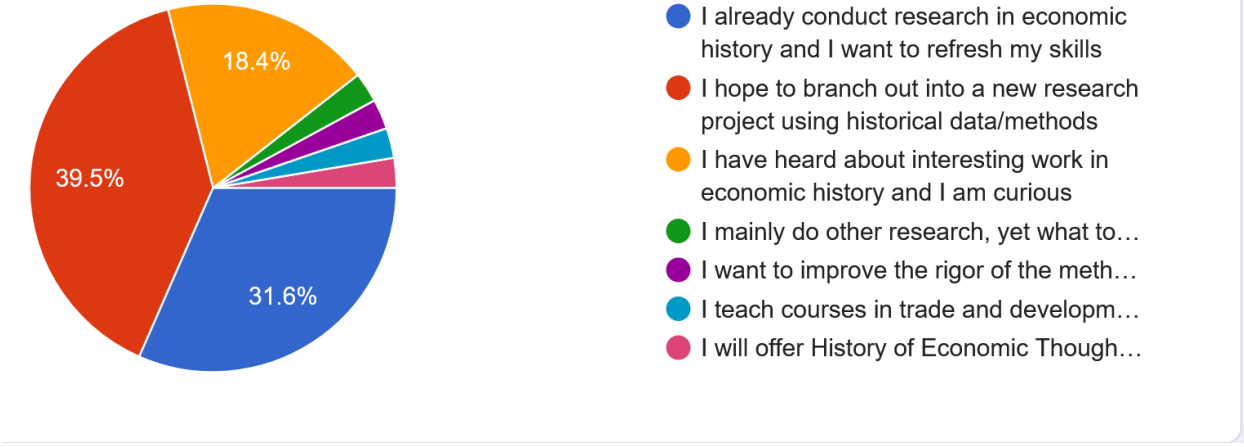
2022 AEA Continuing Education
Quantitative Approaches in Economic History

- Welcome!
- Instructors: Ran Abramitzky (Stanford) and Leah Boustan (Princeton)

"Which best describes your current role/position?"



"Which best describes why you signed up for course?"



Course's goals and organization

1. Discuss exciting new research in economic history
   - Emphasis on how past helps us understand the present
2. Introduce new historical datasets and recent quantitative methods

- Topics, not a comprehensive survey course
  - Why economic history, education and technology, racial disparity, immigration, urbanization, segregation, social programs, intergenerational mobility
- Focus (mostly): US, very recent research

- Please ask questions: virtual raise hand; we will answer questions as we go (time permitting) or leave time at end of each lecture

Lecture 1: Why economic history

Economic history as a small open economy

- Fewer people live there…
- But those of us who choose to live there love it dearly: we feel its intellectual excitement, its challenges, and its sense of community…
- Not a close field where participants mostly talk to one another…
- Stands at a busy intersection of economics, history and other social science…

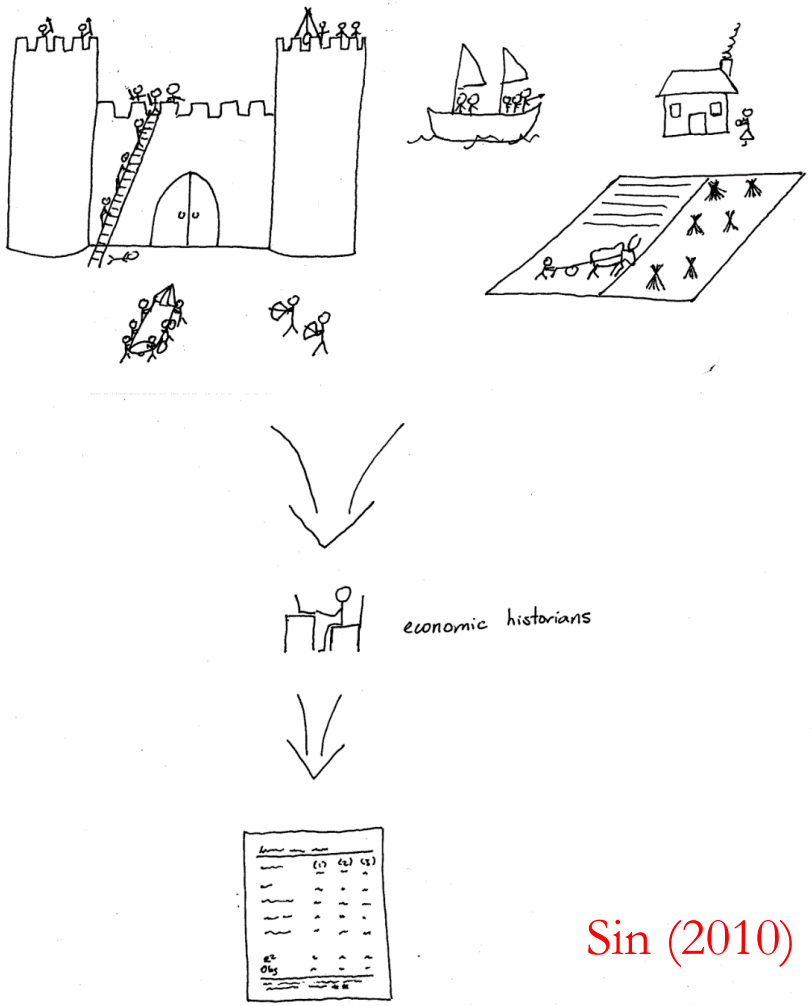
Economic historians care about understanding past societies for their own sake

- Everywhere people lived is interesting, even when no immediate practical use or policy implications

- Historical and institutional knowledge help form hypotheses, guide research strategy and data collection, and interpret quantitative findings

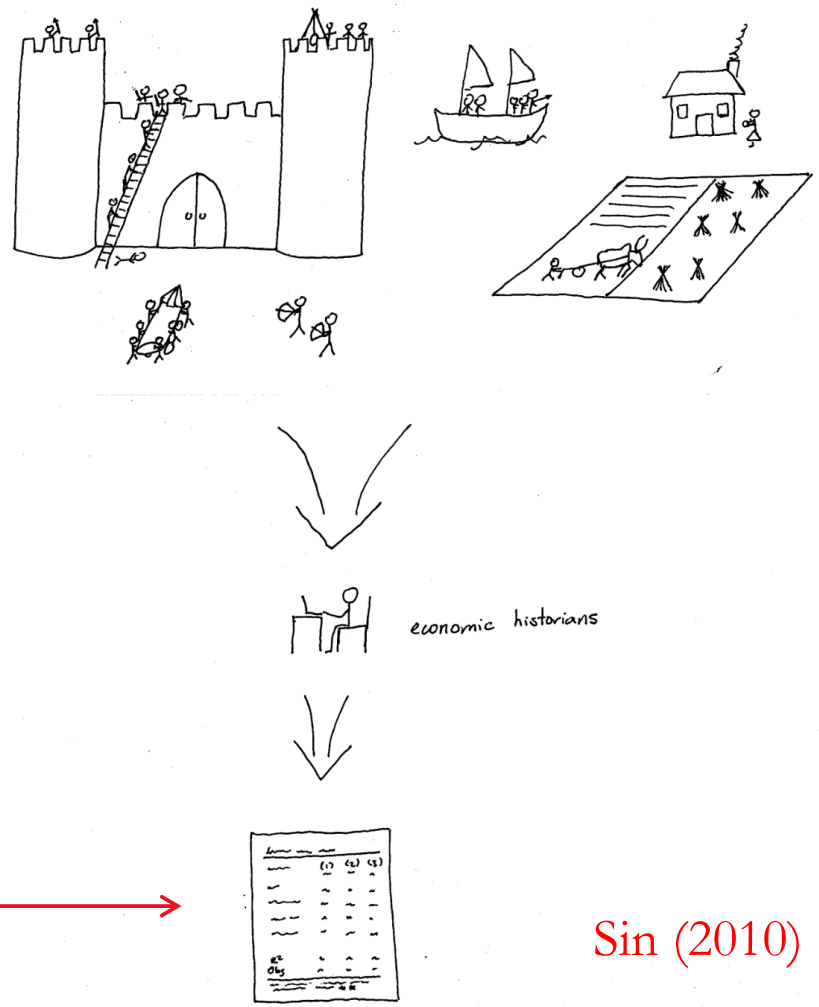
Mokyr (OUP 2005), Abramitzky (JEH 2015)

Economic historians according to my students



Sin (2010)

Economic historians according to my students



Not statistically significant ☺

Sin (2010)

Understanding the past is crucial to understand the present

Economic history "can offer the economist a sense of the variety and flexibility of social arrangements and thus, in particular, a shot at understanding a little better the interaction of economic behavior and other social institutions."

Robert Solow (1985)

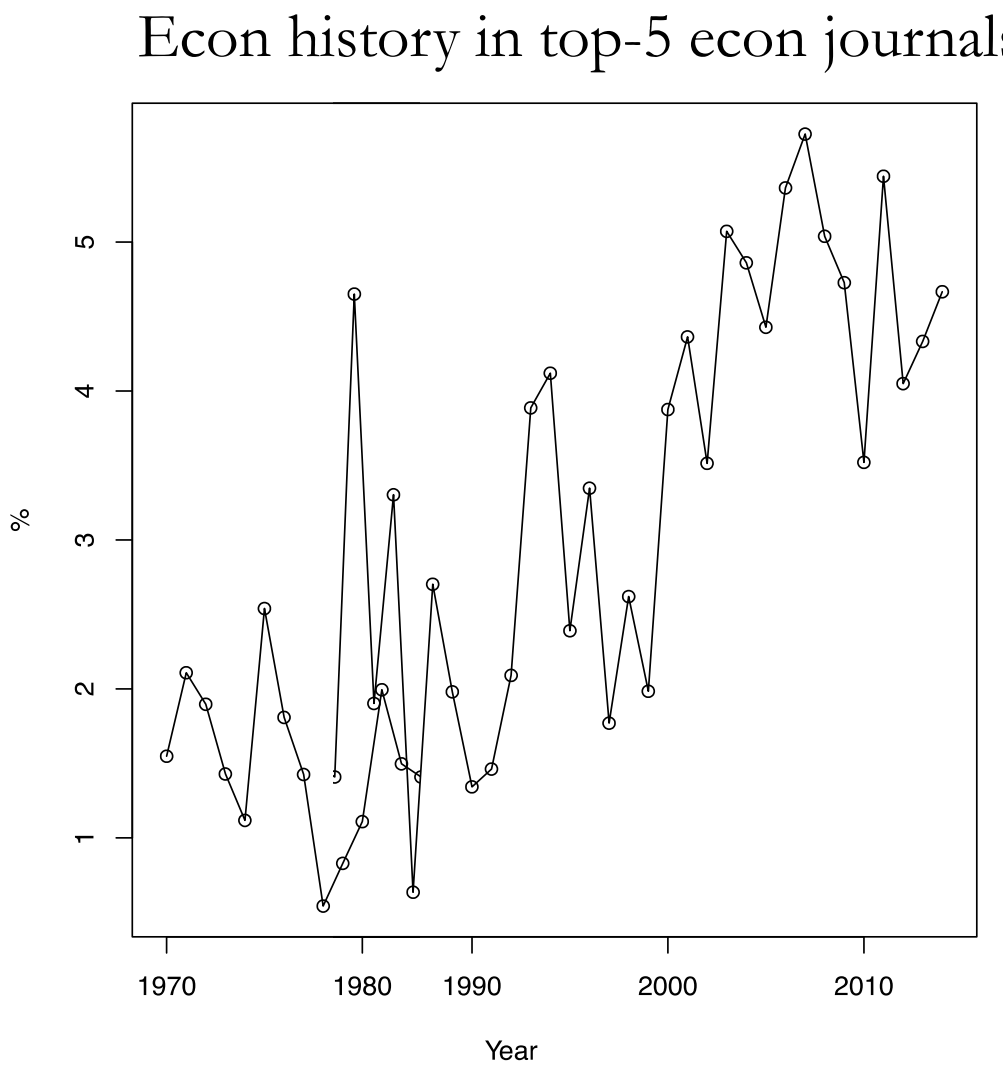
"It will always be true that practical understanding of the present will require knowledge of the past"

Kenneth Arrow (1985)

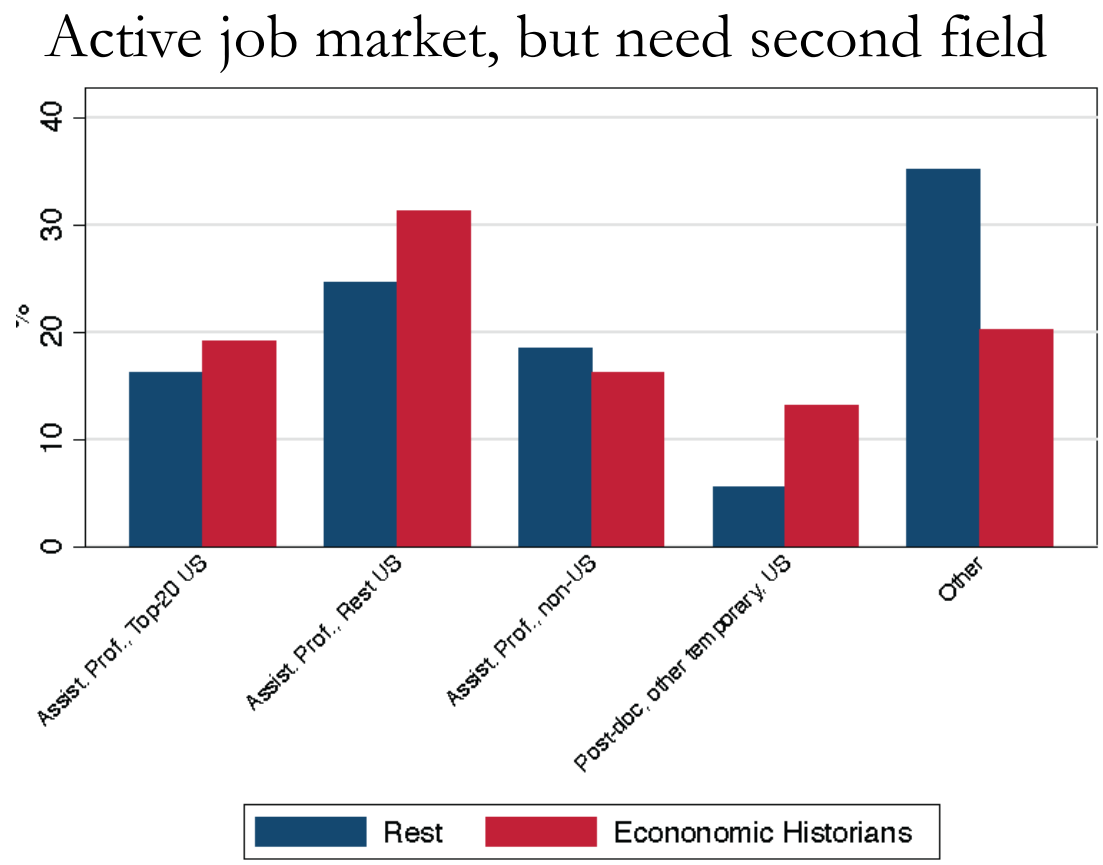
"Have a very healthy respect for the study of economic history, because that's the raw material out of which any of your conjectures or testings will come.

Paul Samuelson (2009)

Economics and the modern economic historian (Abramitzky 2015)



Economics and the modern economic historian (Abramitzky 2015)



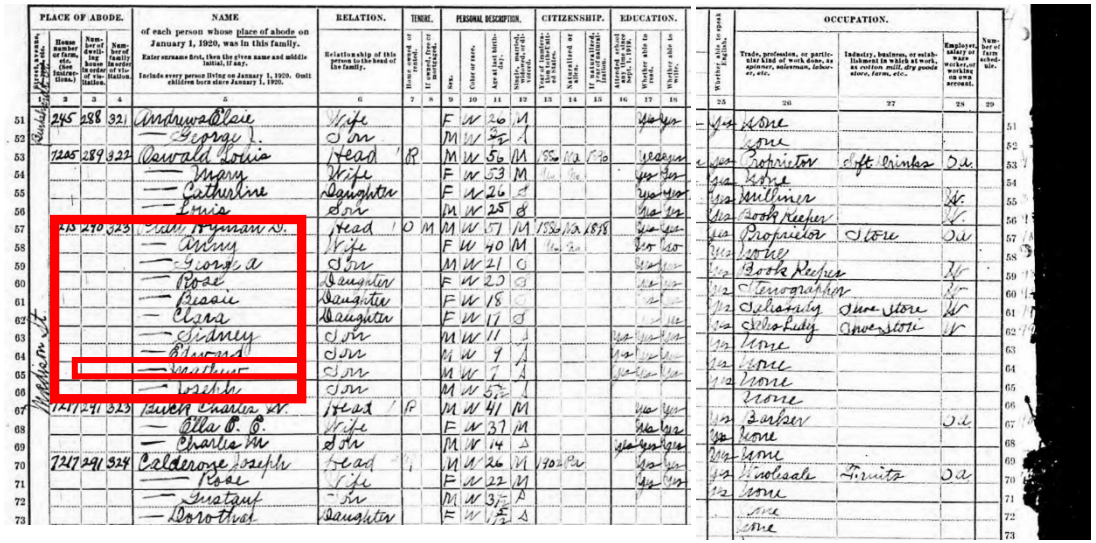
In US, econ history is more economics than history (Margo 2017, Lamoreaux 2015, Cionni et al 2021)

Economic history allows answer important economic questions

1. The past is a big source of data
2. “Natural experiments” in history
3. History to test economic theory
4. History to answer the “big questions”
5. History to help understand present and improve economic policy

1. The past is a big source of data

- Caveat: data not available online
- But data collection itself is a contribution
- Sometimes historical data is better (confidentiality is less of an issue)



Leah's grandfather in the 1920 census

1. The past is a big source of data

- Caveat: data not available online
- But data collection itself is a contribution
- Sometimes historical data is better (confidentiality is less of an issue)

The future: convert text/books into data

2. "Natural experiments" in history

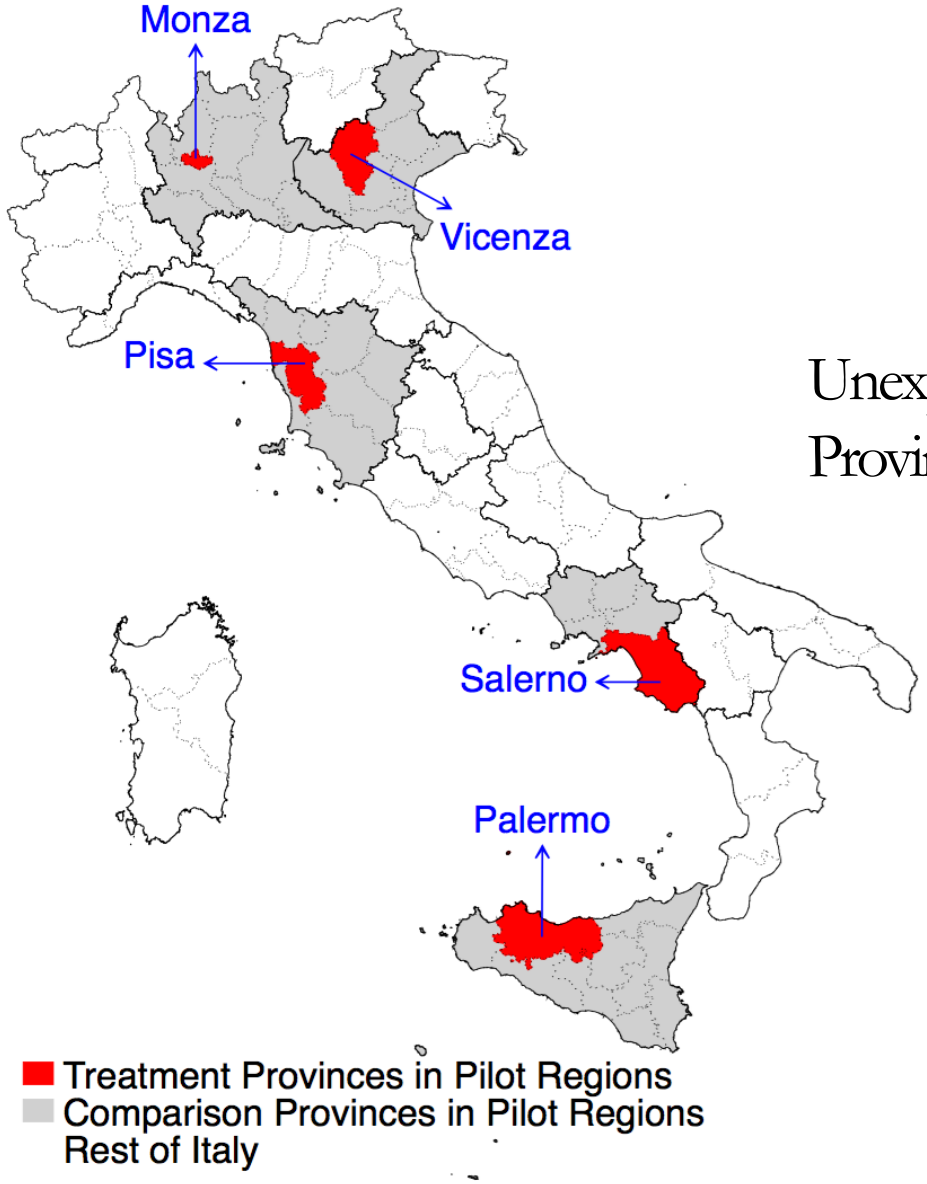
The long-term effects of management on productivity

- The challenge: management is endogenous (Bloom et al., 2013 is RCT of short run effects)
- Evidence from the US Technical Assistance and Productivity Program
  - During the 1950s, as part of the Marshall Plan, US sponsored training trips for European managers to learn modern management practices at US firms
  - Teams of 15-20 managers spent 8-12 weeks in 5/6 US firms

"In the US, we learned to manage firms the way they did and we brought back those practices to our firms" (Francesco Sartori, 1956)

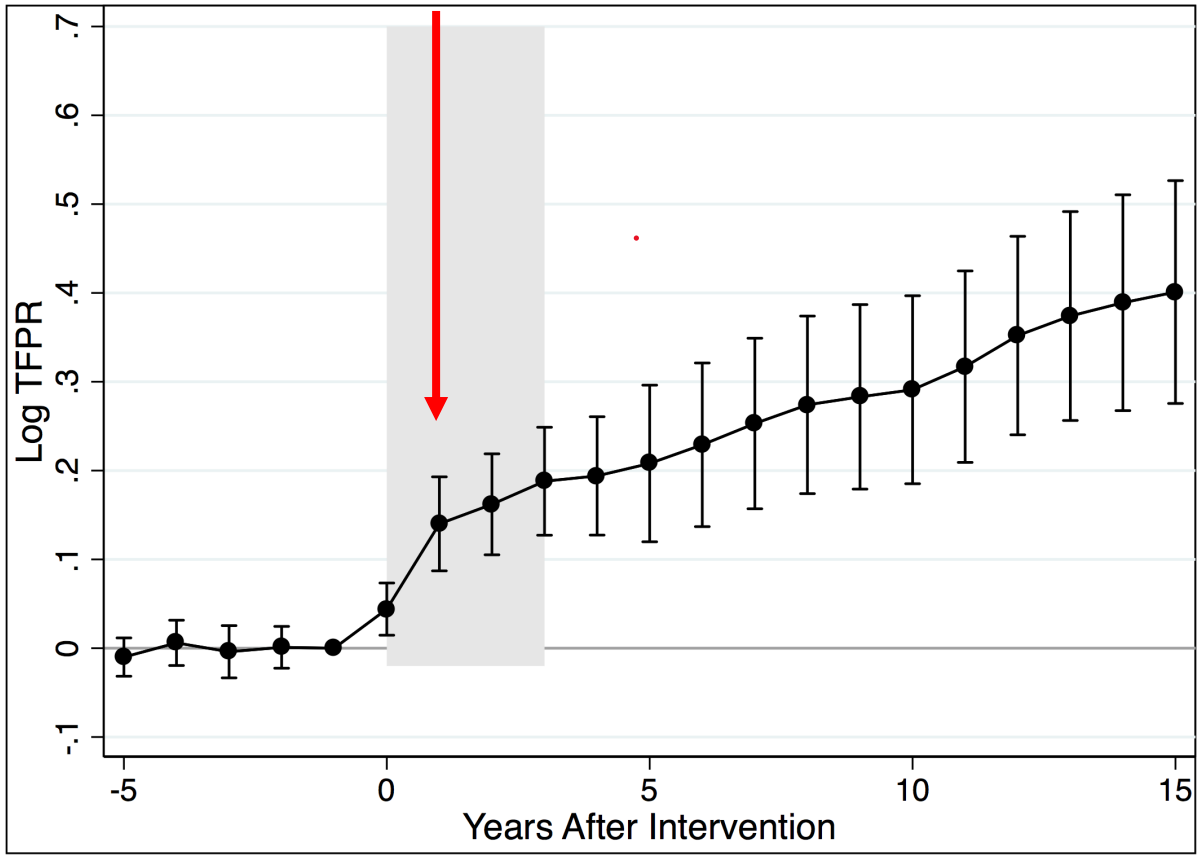
Giorcelli Michela, "The Long-Term Effects of Management and Technology Transfers" *AER* 2019

Small/medium sized manufacturing firms in 5 pilot regions



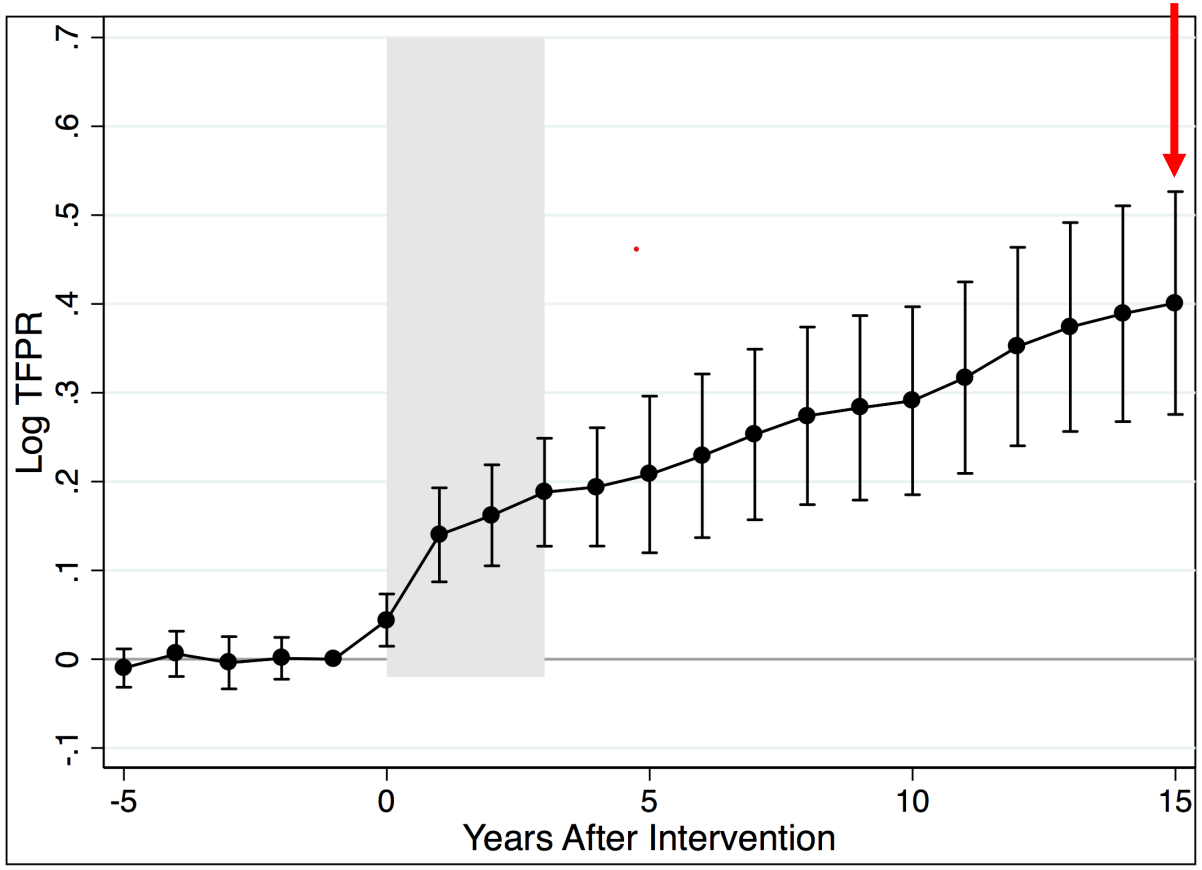
Unexpected Budget Cut: 5 Treated Provinces

15.0% Increase in TFPR
after 1 Year



Notes. The dependent variables are logged TFPR, estimated with the Ackerberg et al. (2006) method. Standard errors are block-bootstrapped with 200 replications.

49.3% Increase in TFPR after 15 Year



Notes. The dependent variables are logged TFPR, estimated with the Ackerberg et al. (2006) method. Standard errors are block-bootstrapped with 200 replications.

3. History to test economic theory

how responsive is investment in education to changes in the return to schooling?

- Theory of optimal human capital investment (Becker 1967, Ben-Porath 1967)
  - We invest in schooling because we expect a return
  - The higher the return, the higher the optimal investment

- Challenging to empirically test responsiveness of schooling to return:
  1. Variation across individuals in rate of return to education is rarely observed
  2. Sharp changes in the rate of return to education rarely occur

- We address this challenge by using an unusual episode of a sharp change in returns to education

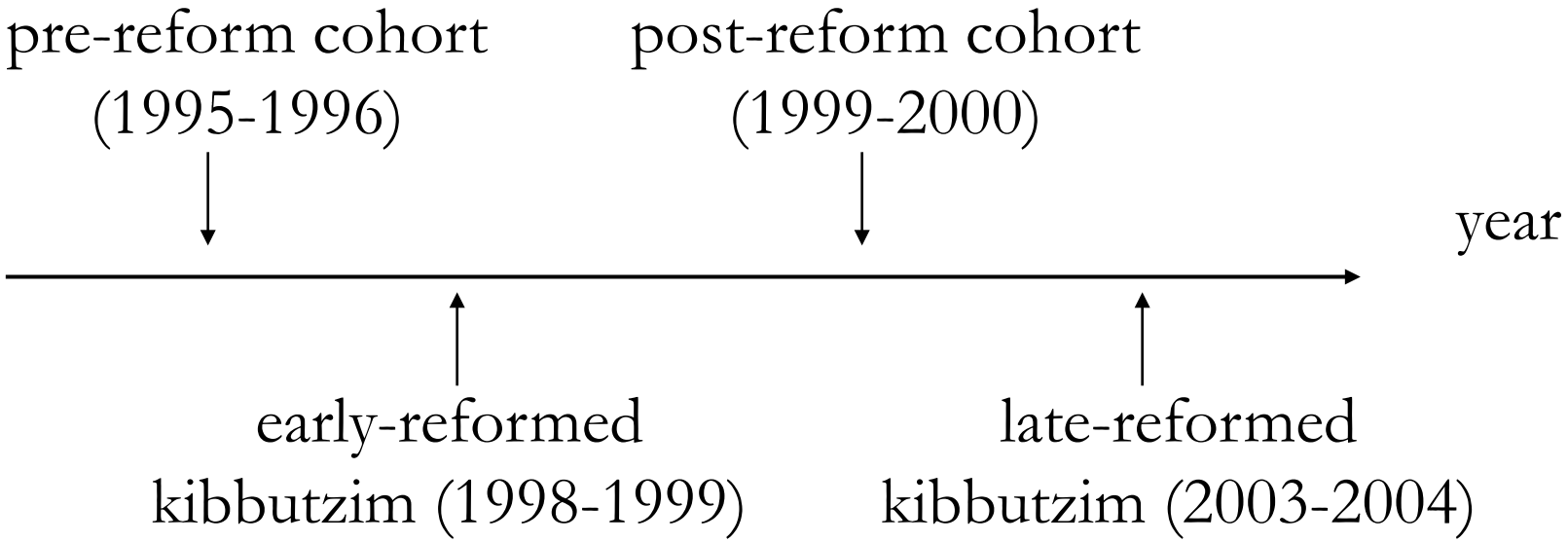
- Setting: Israeli kibbutzim, after decades of wages being independent of individuals' human capital, wages were set to reflect the market rate

Abramitzky and Lavy, "How Responsive is Investment in Schooling to Changes in Redistribution Policies and in Returns?" (Econometrica 2014) and Abramitzky, Lavy and Segev (WP 2021)

3. History to test economic theory

how responsive is investment in education to changes in the return to schooling?

- We test the extent to which this sharp increase in return to schooling induced:
  - high school students to invest more in education
  - young adult to select a major with higher returns



3. History to test economic theory

how responsive is investment in education to changes in the return to schooling?

High school

	High School Completion	Mean Matriculation Score	Matriculation Certification	University Qualified Matriculation
Controlled Difference-in-Differences	0.033 (0.015)	3.546 (1.604)	0.049 (0.035)	0.060 (0.035)
Pre-treatment mean	95%	70.6	55%	51%

University

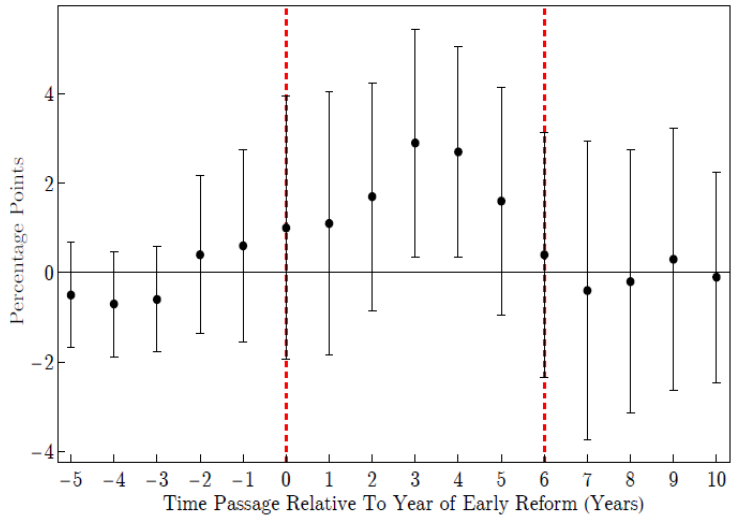
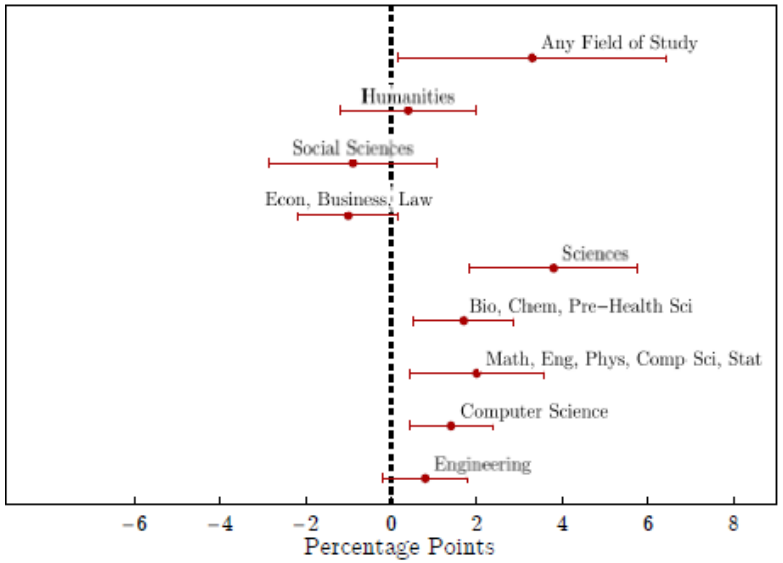


Figure 5: Treatment-Control Differences in Proportion Receiving BA Degree, By Years Since Reform

(c) Treatment Effect



Labor market

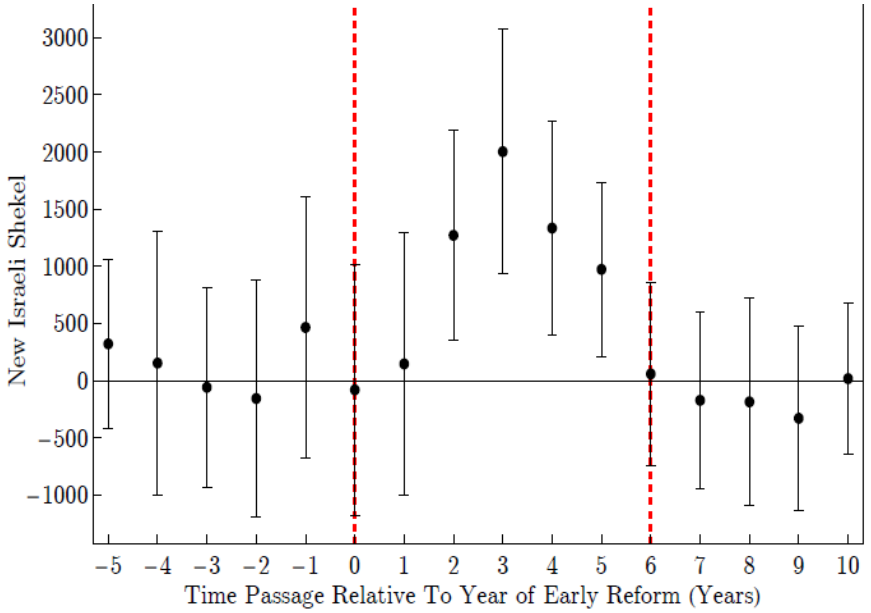
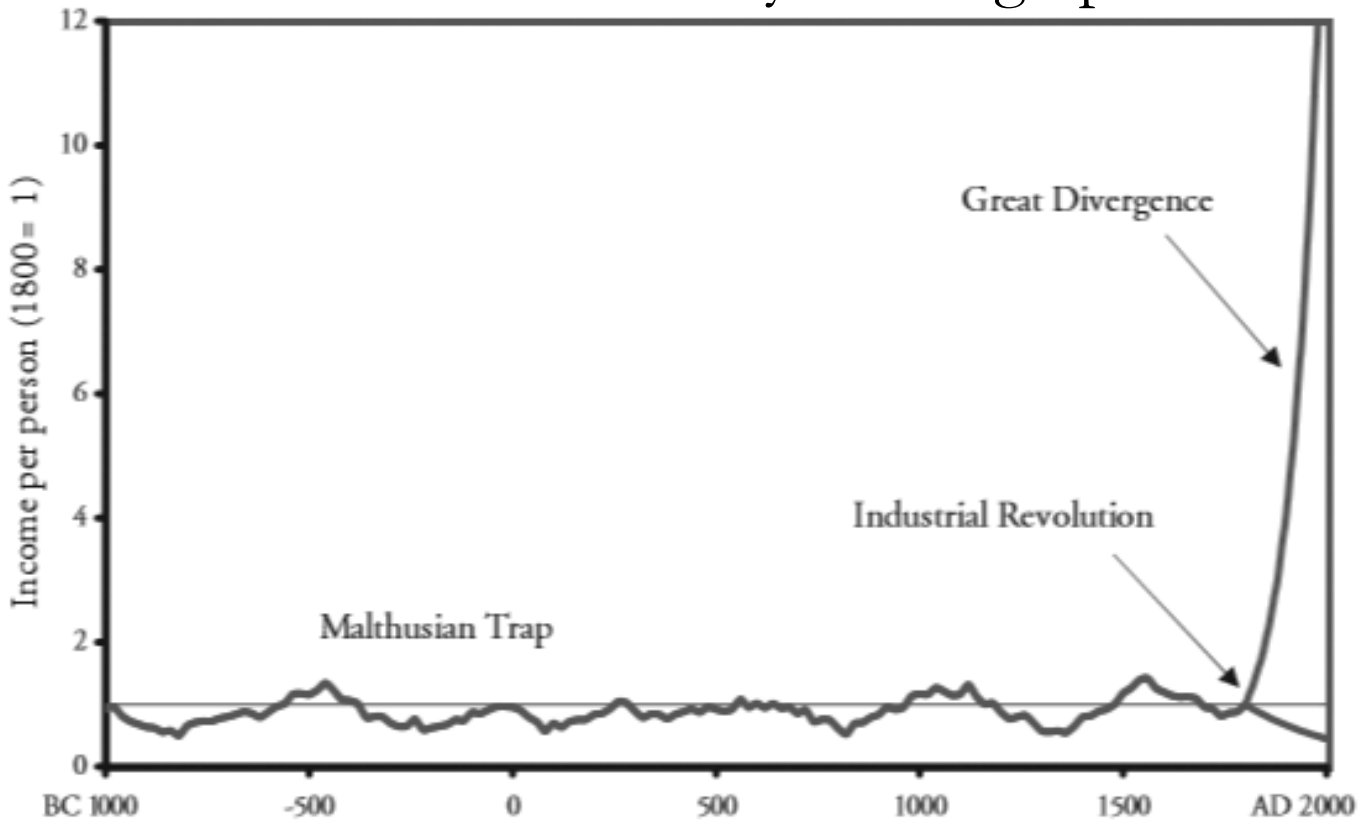


Figure 6: Treatment-Control Wage Differences at 2014, By Years Since Reform

4. History to answer the big questions

World economic history in one graph



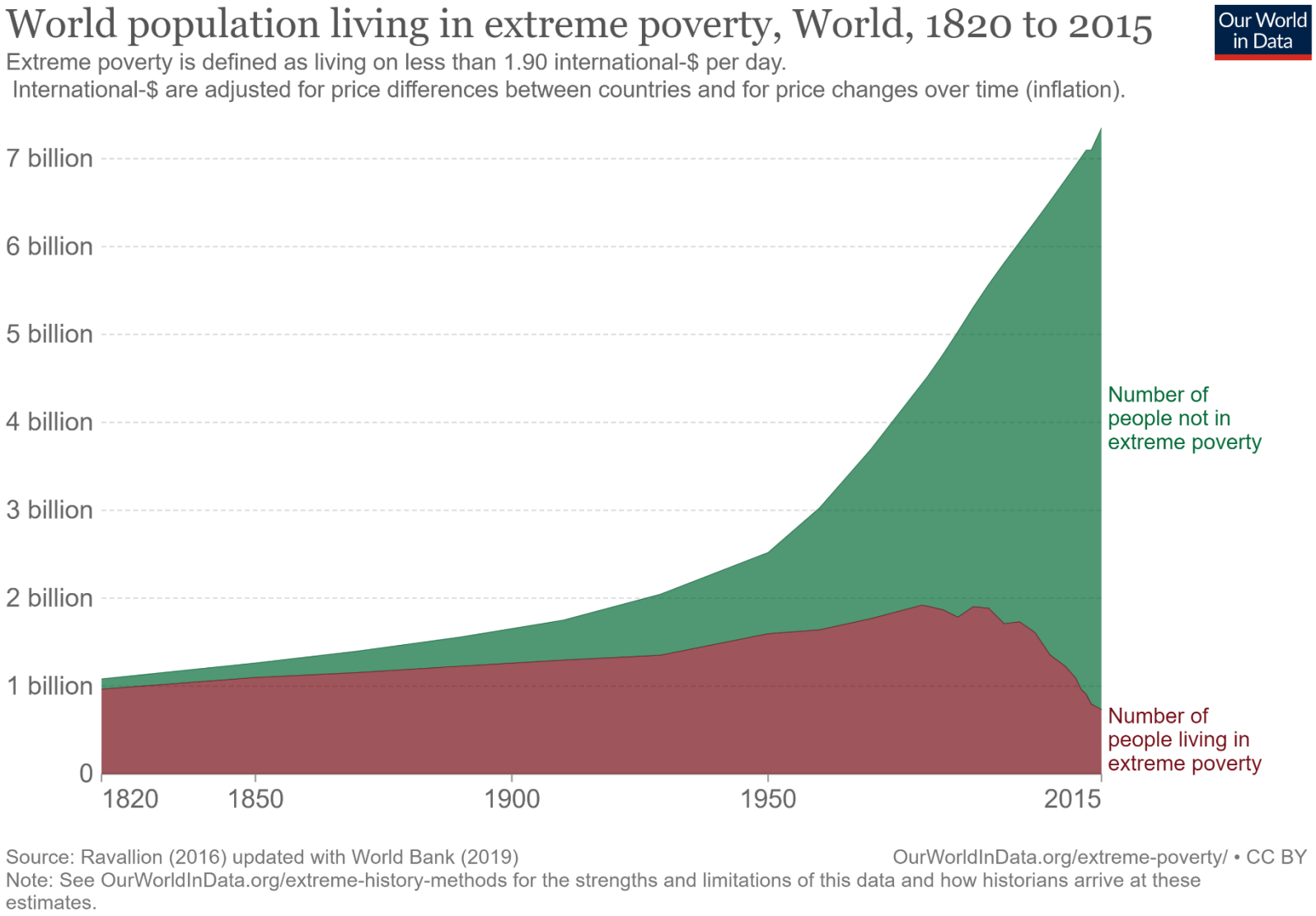
Clark 2007

World before 1800

- Average person in 1800 wasn't better off than stone age ancestor:
- Income per person (food, clothing, heat, light, housing) shows no trend
- No increase in life expectancy (30-35 years!)
- No increase in stature (a measure of quality of diet and of children's exposure to diseases)
- Hunters-gatherers were more egalitarian
  - Large inequalities in agrarian economies around 1800
- Riches were few and dominated the masses
- "Malthusian trap": Short-term technological progress lost through population growth; income per-capita remained at subsistence level

Post 1800

- In some countries, income per-capita has undergone sustained growth
- Richest economies are now 20-50 times richer than in 1800
- Industrial Revolution reduced income inequalities *within* societies
  - Within richest countries: unskilled benefited more
- But increased income inequality *between* societies
  - Poorest countries (mainly in sub-Saharan Africa, e.g. Tanzania, Malawi) are not richer than in 1800
  - Poorest countries still trapped in Malthusian era
- Process called "great divergence": gap in income ~50:1



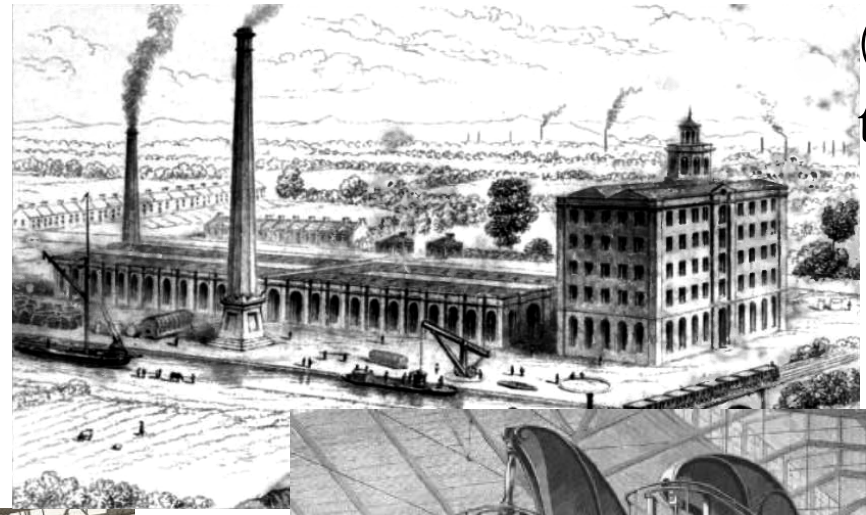
- https://ourworldindata.org/world-poverty/

The escape from Malthusian trap

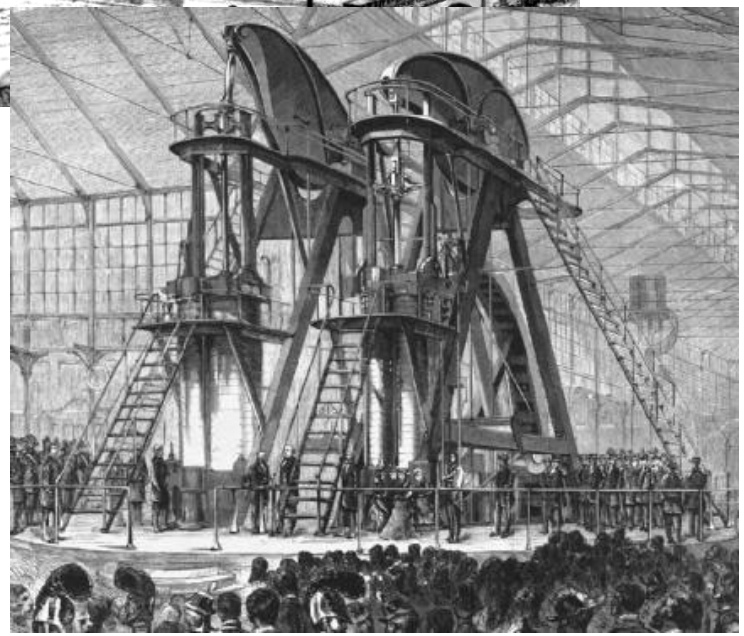
Two main events between 1760-1900:

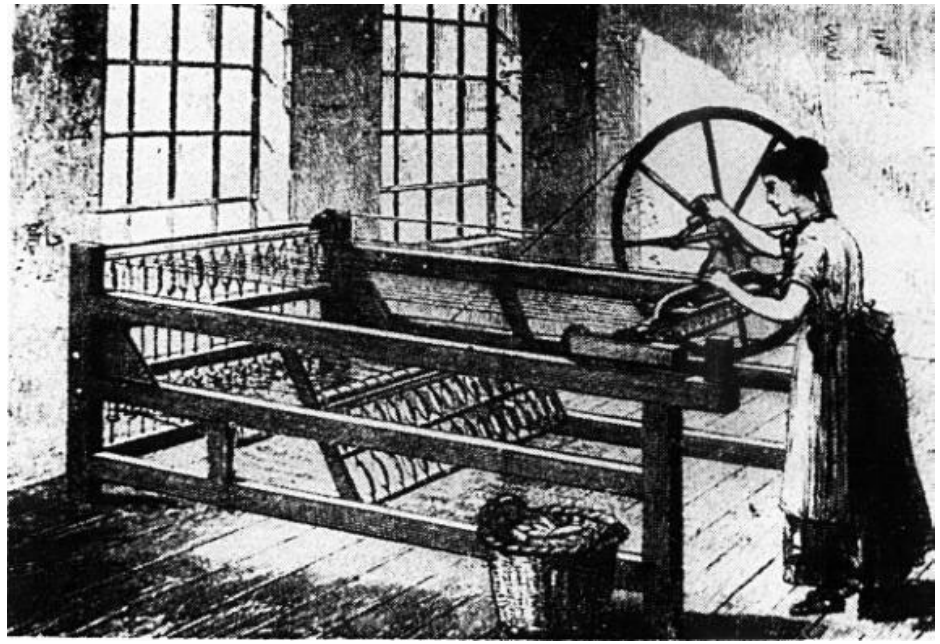
1. **The Industrial Revolution**: dramatic technological advance driven by advances in knowledge that brought for the first time sustained economic growth
2. **The Demographic Transition**: decline in fertility, which allowed the technological advance of the IR to translate into dramatic rise in income per capita

The industrial revolution: many macro and micro inventions (Mokyr)



Invention of steam power (fueled by coal): powered the factories and railroads



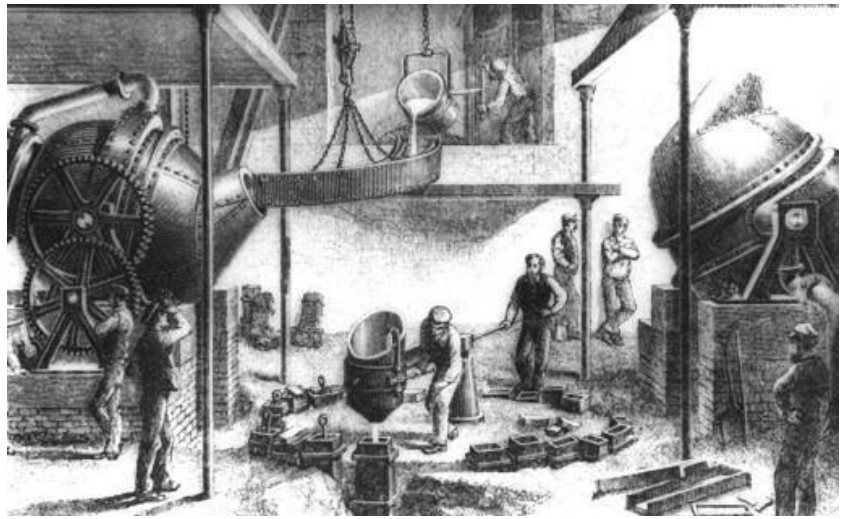


Spinning Jenny
(invented in 1764)

Invention of mechanical spinning – substitute by machine the fine movements of human fingers

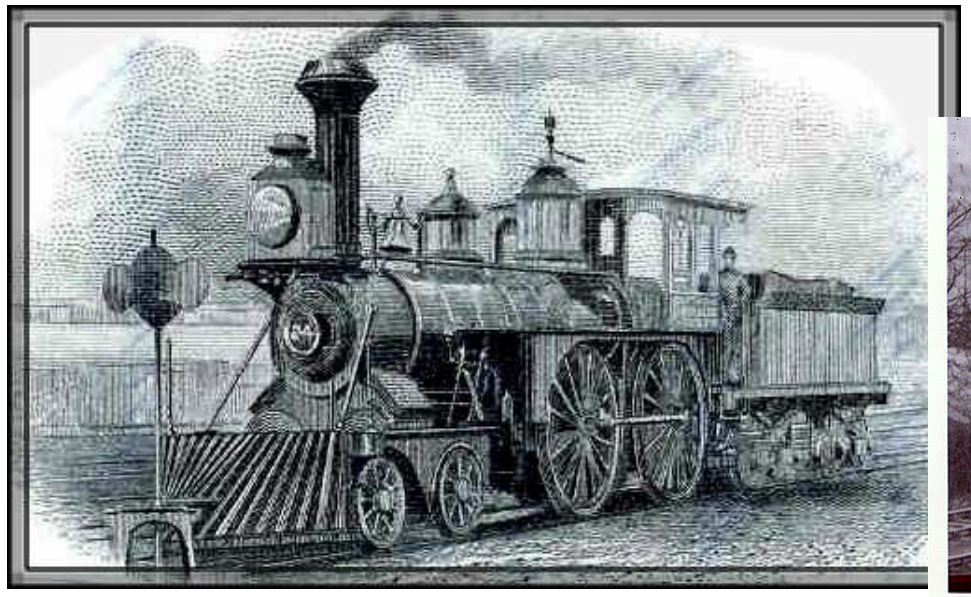
Rise of factory system / spinning mills (and massive child labor)

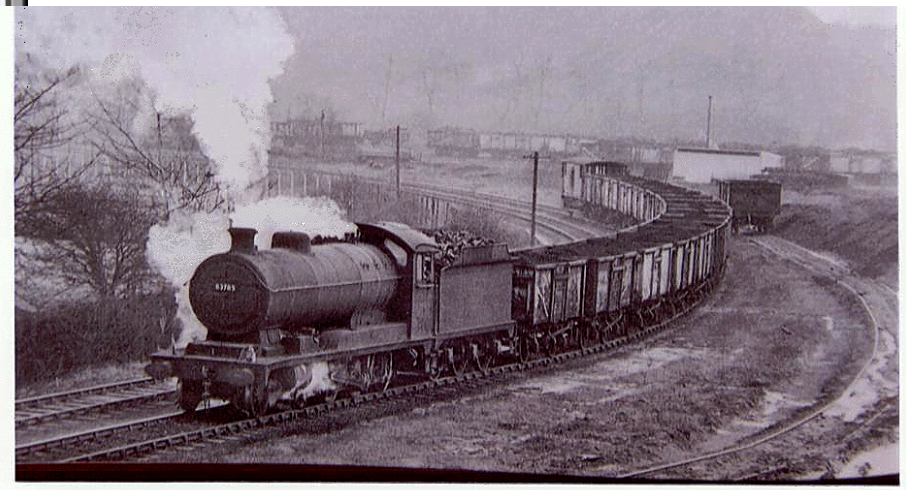
Created big cotton industry in England, and led to emergence of cotton economy (and persistence of slavery in US)



Development of iron-making techniques

Introduction of canals, expansion of railways, increased trade

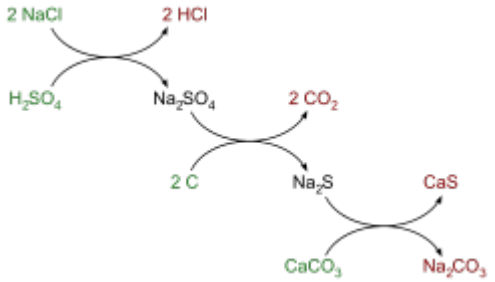




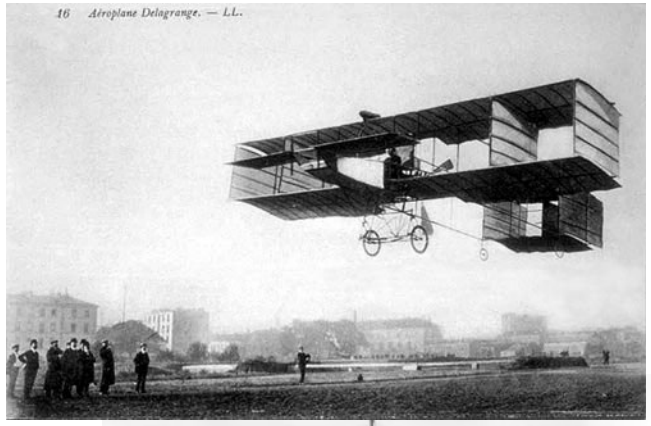
- Smallpox vaccination process (1798 by Edward Jenner) – radical idea to insert non-human substance into human body

Dr Edward Jenner performing his first vaccination on James Phipps, a boy of age 8. May 14th, 1796. Painting by Ernest Board (early 20th century)

- The Leblanc soda-making process (1787) and bleaching powder (1798) that laid the foundation for a chemical industry

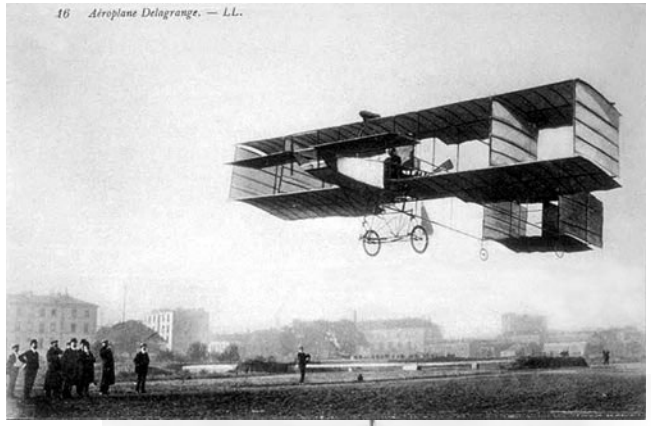


- And many more…



Second industrial revolution
- 1870-1914: advances in chemical, electrical and steel industries.

Key inventions: steam-driven steel ship; airplanes; mass production of consumers good; mechanical refrigeration; telephones



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The demographic transition

- **Before 1800**: short life, young population, many births
- **After 1800** (Europe, later for others): mortality declined then fertility declined (from around 1890); longer life, older population

Global Population Trends Over the Transition: Estimates, Guesstimates and Forecasts, 1700–2100

	Life Expectancy (Years at Birth)	*Total Fertility Rate (Births per Woman)*	*Pop Size (Billions)*	*Pop Growth Rate (%/Year)*	*Pop < 15 (% of Total Pop)*	*Pop > 65 (% of Total Pop)*
1700	27	6.0	.68	0.50	36	4
1800	27	6.0	.98	0.51	36	4
1900	30	5.2	1.65	0.56	35	4
1950	47	5.0	2.52	1.80	34	5
2000	65	2.7	6.07	1.22	30	7
2050	74	2.0	8.92	0.33	20	16
2100	81	2.0	9.46	0.04	18	21

Source: Population numbers and growth rates for 1700 are taken from Biraben (1980) and for 1800 from United Nations (1999). The figures for TFR and $e(0)$ are best guesses by the author, consistent with the population growth rate based on Coale-Demeny (1983) Model South Female stable populations with an average age of childbearing of 31 and should not be treated as data. The figures on age distribution are likewise based on these model stable populations. Data for 1900 are from Chamie (2001), for 1950–2050 from United Nations (2003) and for 2100 from United Nations (2000).

Ronald Lee (JEP 2003)

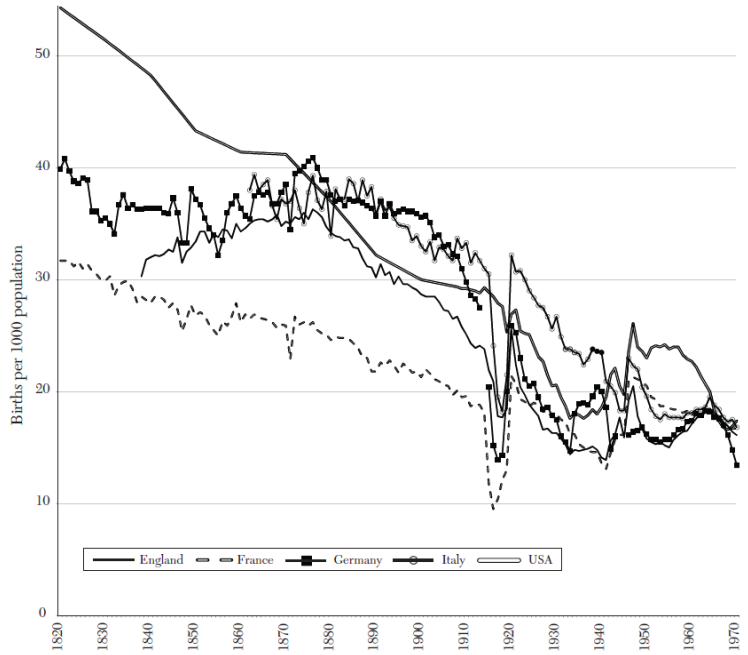


Figure 1. Crude Birth Rates, Selected Countries, 1820–1970

Note: For the United States, values before 1909 are linear interpolations between decennial census years.
Source: Crude birth rates as reported in Mitchell (1980).

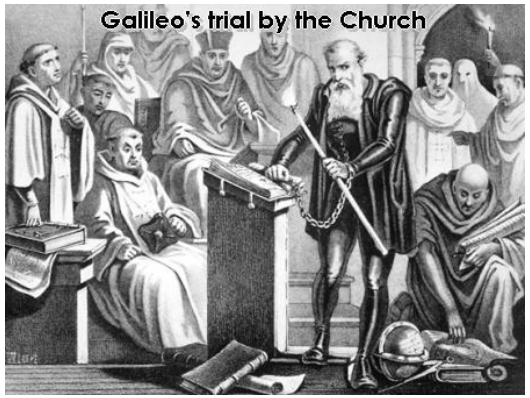
Timothy Guinanne (JEL 2011)

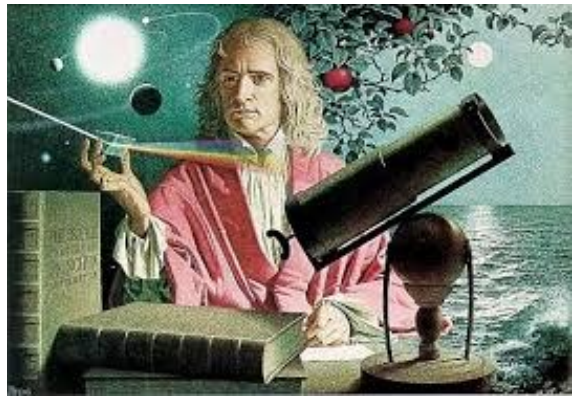
The “big questions” in economic history

- Why did Malthusian trap persist for so long?
- Why did the Industrial Revolution and the sustained economic growth that followed:
    1. occur in 18th century and not some other time?
    2. happen in Europe/England and not elsewhere?
- Why didn’t industrialization make the whole world rich?, i.e. what caused “great divergence”?
- Why are some countries rich and others poor?
- Mokyr, McCloskey, David, Clark, North, Weingast, Allen, Engerman, Sokoloff, Haber, Galor, Moav, Pascali, Diamond

The "Industrial Enlightenment" story

- Why did IR happen in the 18th century and why in Europe? Why was growth sustained?
- Answer: because of the European industrial enlightenment of the 18th century people sought to understand nature and manipulate it for their economic purposes
- Notably: scientific revolution of the 17th century





Mokyr (2002, 2009, 2016)

The "Industrial Enlightenment" story

- Emphasizes the role of propositional knowledge (e.g. science) and prescriptive knowledge (e.g. engineering)
- Talks about "useful knowledge", for example technology
- Pre-IR: most advances were in prescriptive knowledge, so eventually runs into diminishing returns
  - Social divide between those who knew things ("savants") and those who made things ("fabricants")
- Post-IR: increase in both, and positive feedback between them, producing a virtuous cycle and sustained growth
  - Communication between savants and fabricants

Mokyr (2002, 2009, 2016)

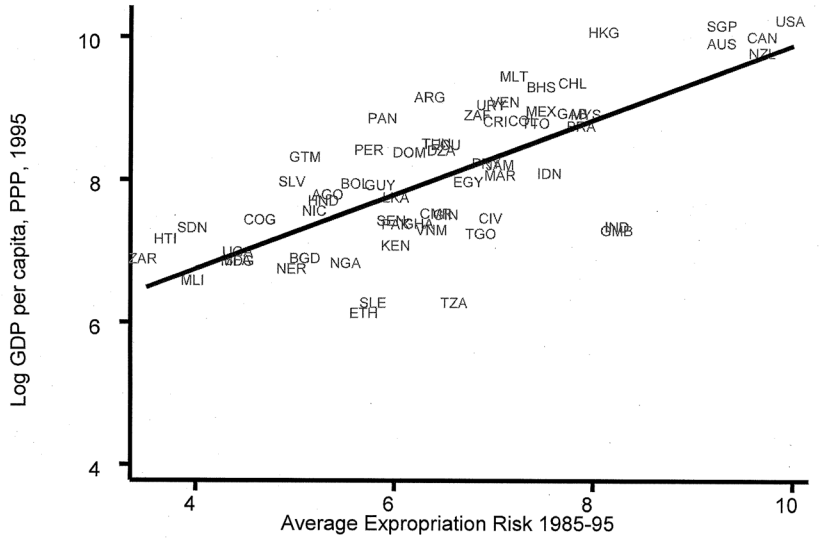
Why are some countries rich and others are poor?

- Big question
- Impossible to nail, but econ history is open to suggestive evidence on big questions
- Economic historian have long felt institutions are important for development
- Challenge: institutions are endogenous
  - Solution #1: deep qualitative historical research, on more trackable versions of big question (e.g. North and Weingast, Mokyr, Engerman & Sokoloff)
  - Solution #2: quantitative, applying modern econometric techniques for causal inferences

Acemoglu, Johnson and Robinson's influential insight

- Applying modern econometrics to study effect of institutions on development
  - Insight: use causal econometric methods to study long term persistence of institutions
- Among the most cited papers of the last 20 years
  - Huge influence on economic history research (new subfield of persistence)
  - Research received criticism on validity of instrument, but key contribution is this insight
- Inspired tons of research that focused on more specific settings and combined quantitative techniques with deep historical research

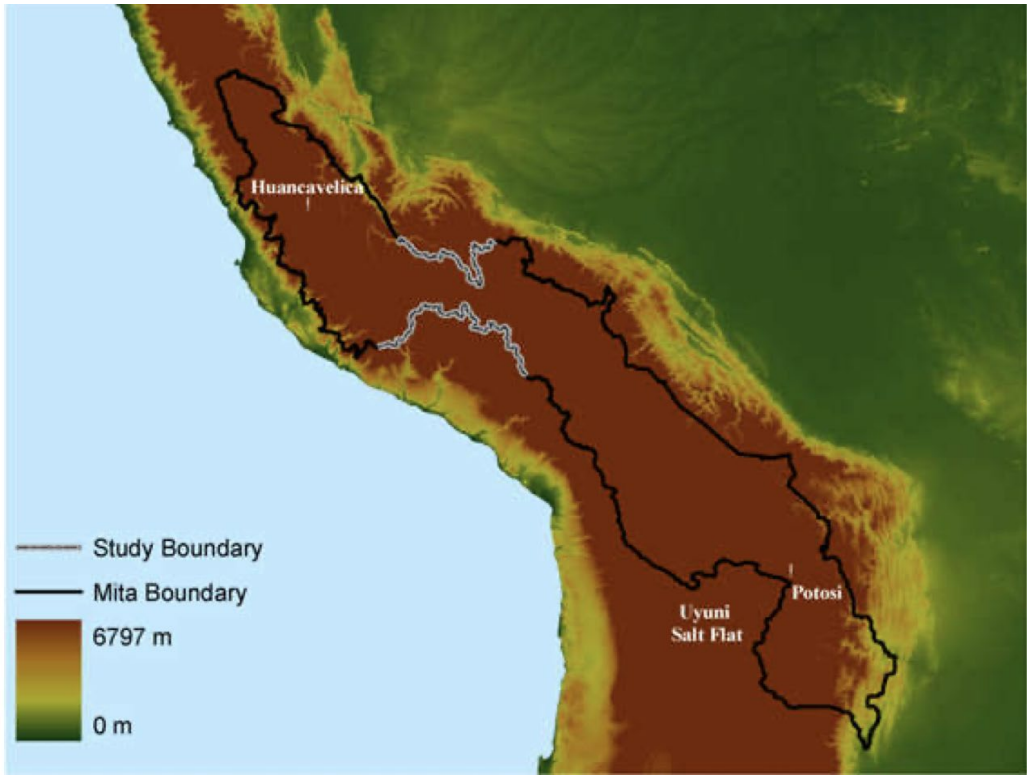
Daron Acemoglu, Simon Johnson, James A. Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation," *AER* 2001



The persistent effects of Peru's mining Mita

- Mita – forced labor draft in historical Peru and Bolivia that was enforced for more than 200 years starting in the 1570s

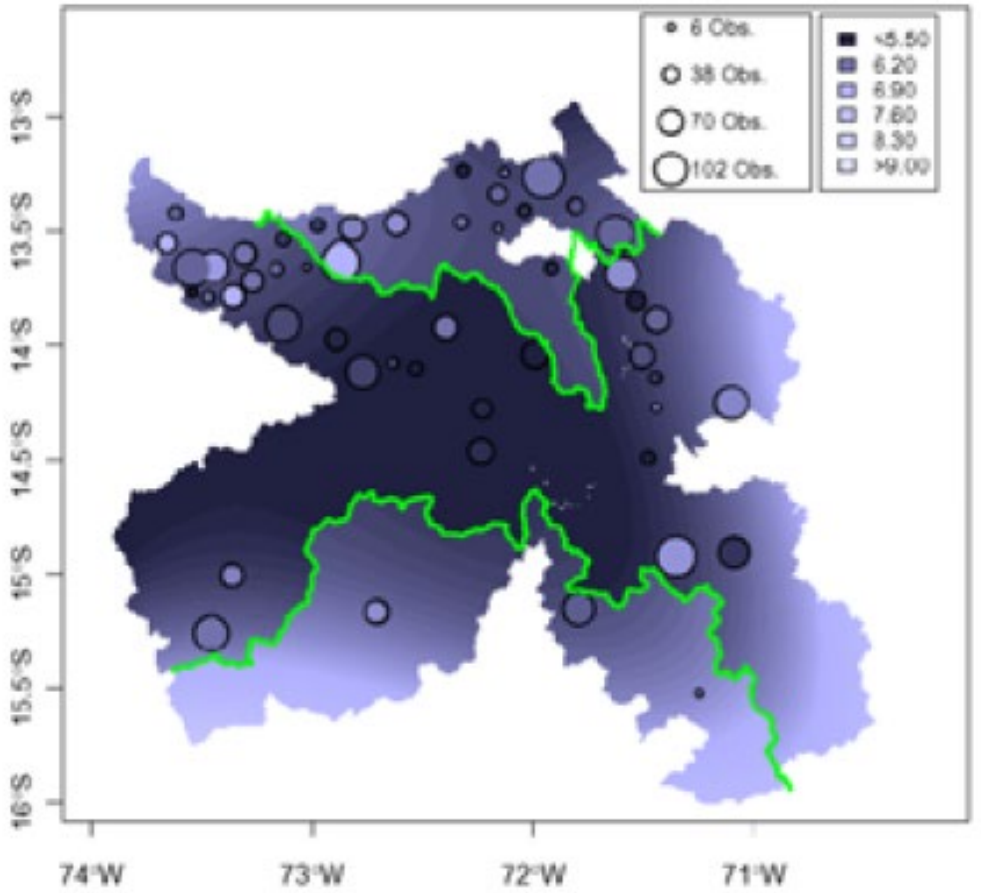
- Forced indigenous communities to send part of their male population to work at the mines of Potosi (much of the silver Spain brought from the new world comes from those Potosi mines)



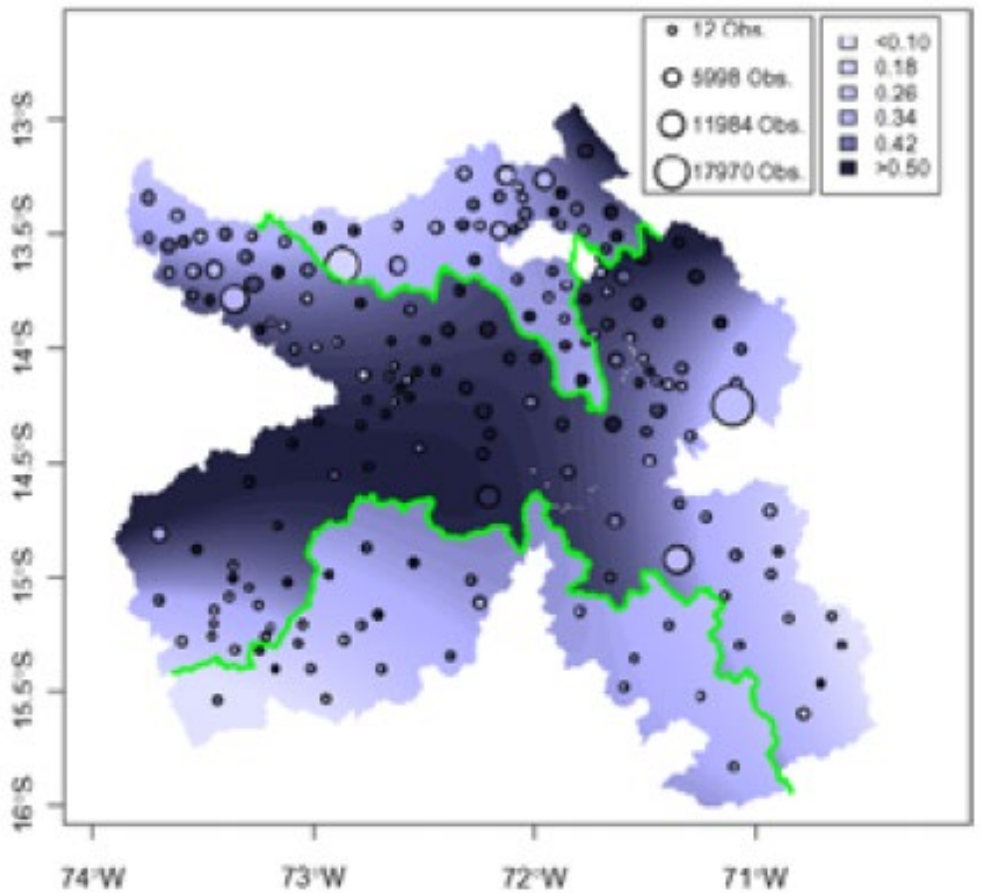
The Mita Boundary

Melissa Dell "the persistent effects of Peru's mining Mita" (Econmetrica 2010)

More poverty today in places that were subjected to Mita in past



(a) Consumption (2001)

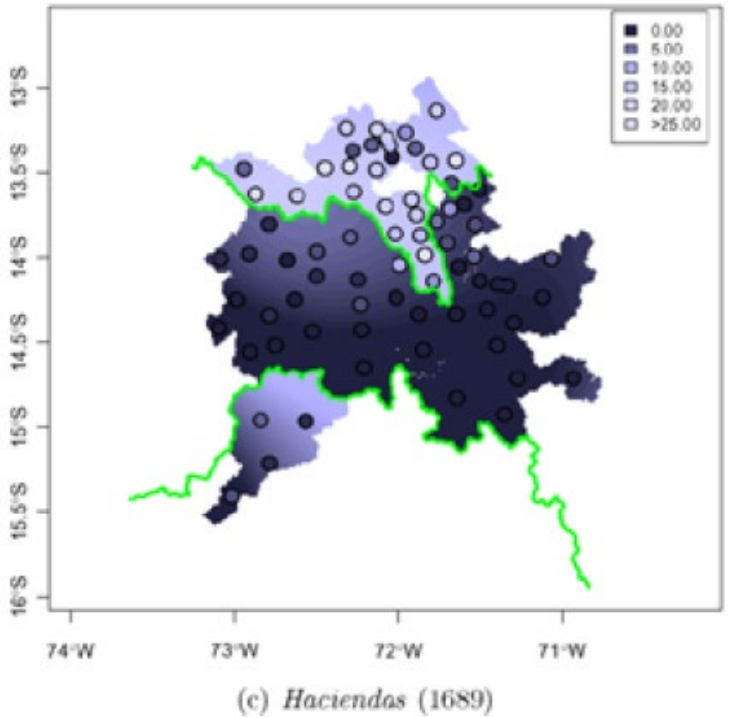


(b) Stunting (2005)

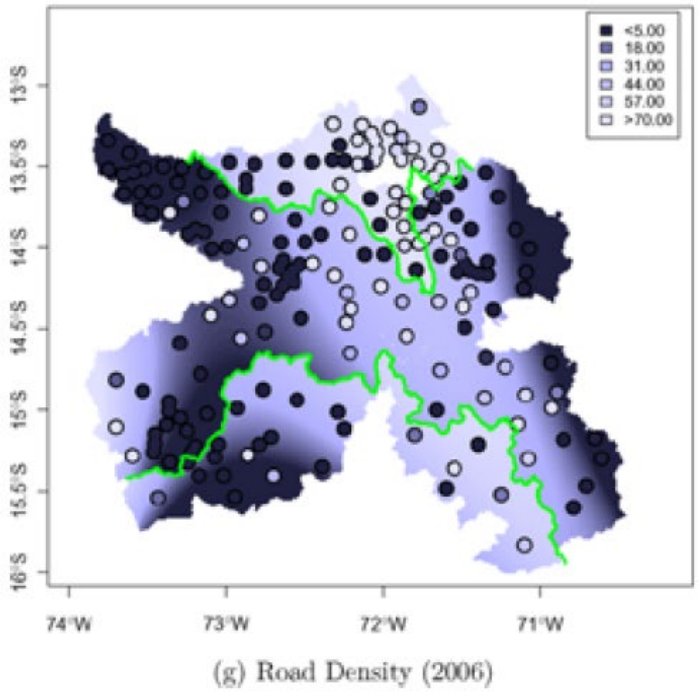
Lower consumption today

Stunted growth among children due to poor nutrition

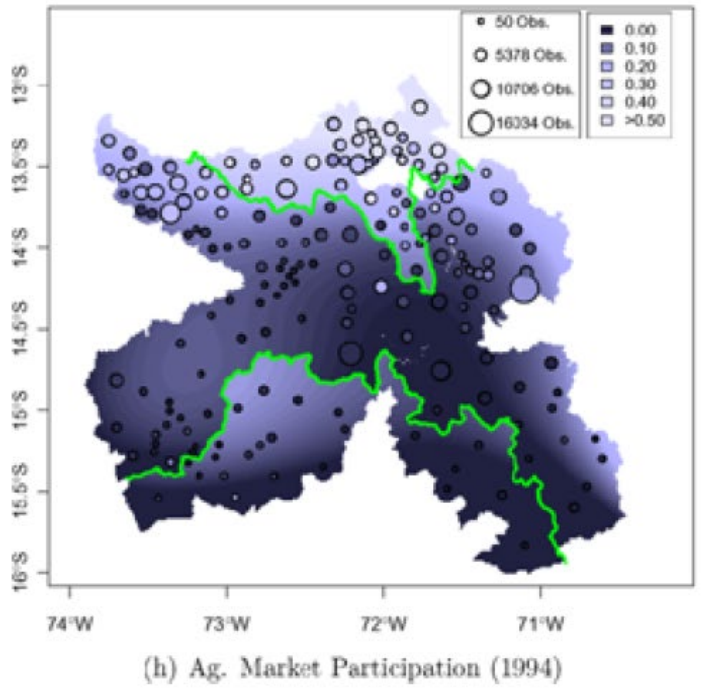
Channels of persistence – land tenure and public goods



(c) *Haciendas* (1689)



(g) Road Density (2006)



(h) Ag. Market Participation (1994)

Private property (of large landholders) in non-Mita areas, communal and poorly defined property rights in Mita areas

Long term presence of large landowners in non-Mita Private property provided stable land tenure and encouraged public good provision

5. History to improve economic policy

- Current problems often have historical roots
  - Black-white economic convergence (lecture 2)
  - Race between education and technology (lecture 3)
  - Immigration under more open borders (lectures 4 and 5)
    - Window to counterfactual world
  - Education and urban policies (lectures 7 and 8)
  - Inequality and social mobility (lectures 9 and 10)
  - Challenge "living in unprecedent times" claims (pandemic, financial crisis)

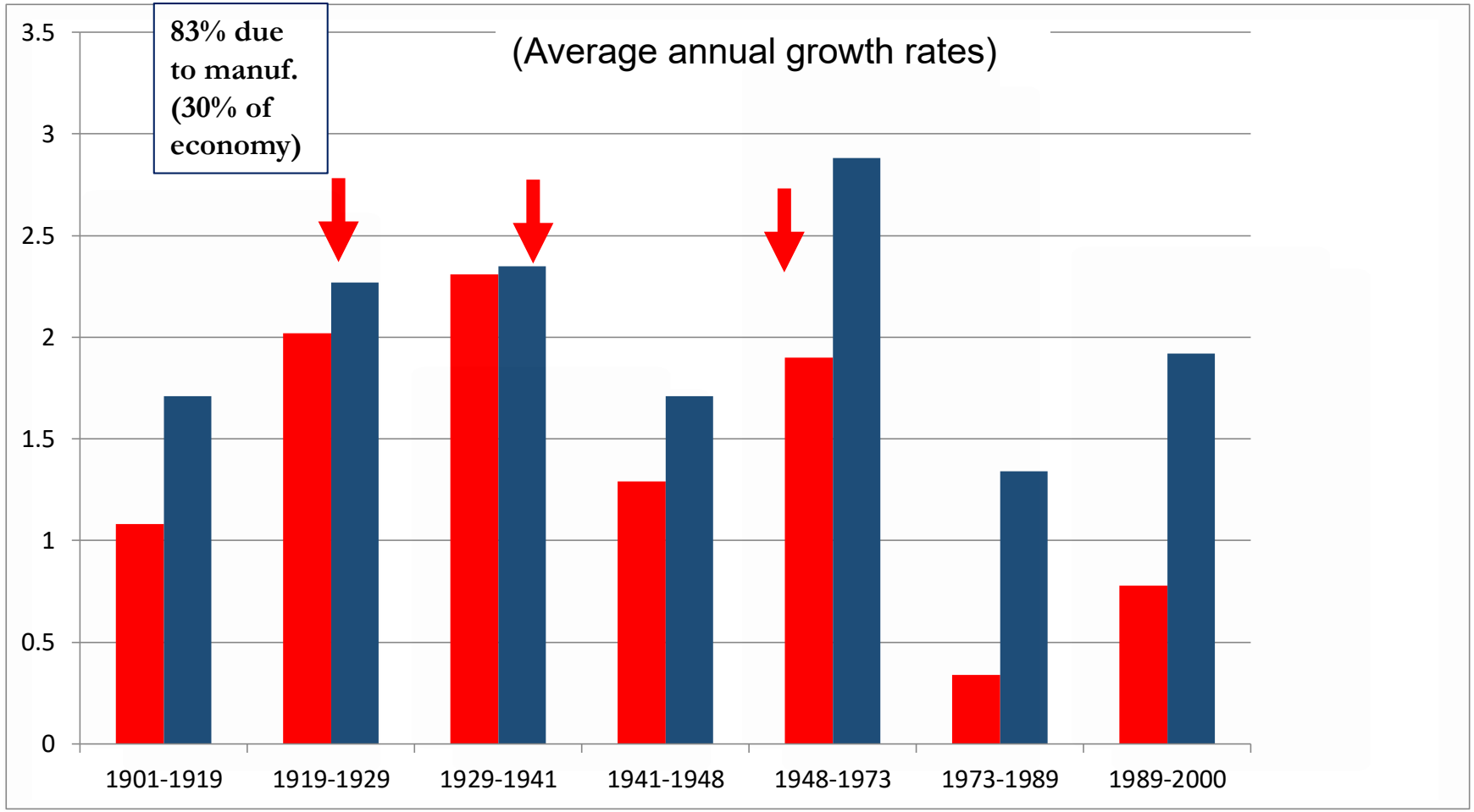
Lecture 2: Race between education and technology

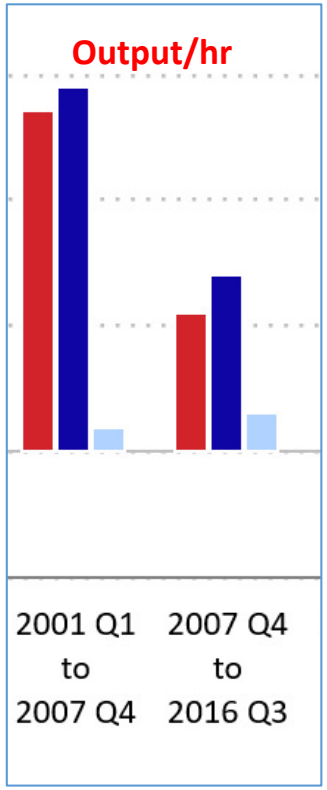
- **Demand for skill** rises with spread of new technologies → wages of high-skilled increase
- Higher wages may prompt some families to send their children to school → **supply of skill** increases and wages moderate
- We will consider two episodes: Second industrial revolution/high school movement (c. 1910) and computer revolution/college going (c. 1980)
- Ironically, of all topics covered, this is the area where there is much room for new research: Exploring specific technologies, bringing in detailed data on schools

When has technological change been the most rapid?

TFP and output/hour in non-farm sector, 1870-2016

TFP growth
1870-1900
~1% aa





Source: Field, *JEH* (2006); BLS; Gordon (2016)

What came before: First Industrial Revolution (1780-1890)

- Main industries:
  - Textiles (clothing, boots, gloves…)
  - Early metal work: Agricultural implements; arms; machine tools

- Shift from artisan shops (1-5 workers) to small, non-electrified factory (e.g., 20 workers)

- Potential sources of returns to scale in this period: Division of labor; capital with high fixed costs (e.g., steam engines)
  - Evidence from Census of Manufactures from 1820-1880
  - Sokoloff (1984): Larger firms more likely to employ women and children (14% if 1-5 workers, 54% if 15+ workers)
  - Margo (2015): Output/worker higher in firms with more workers, especially after adjusting for worker undercount in small firms; true even in firms that used only animal power

New evidence on division of labor from Hand and Machine Labor Study

	Hand	Machine
Level or Logs?	Level	Level
Number of Workers	8.9	34.6
Number of Tasks	10.3	17.6
Time (in hours) Needed to Complete One Unit of Output	30.03	5.62
Percent Male	0.73	0.70

Hand methods require 5x labor time!

613 matched firm pairs in 1880 producing equivalent product

Table 2

The Productivity Effects of Steam and Water Power Use in Machine versus Hand Production: 1:1 Task Transitions

Independent variable	*ln (Time spent in machine task) – ln (Time spent in hand task)* (1)
Δ (Steam = 1)	−1.13 (19.29)
Δ (Water = 1)	−0.35 (2.86)
Adjusted R^2	0.52

Note: The sample consists of tasks in the 1:1 transition category for which there was complete information on the regression variables (N = 4,257). The dependent

Realizing the full returns to mechanization required steam power

Source: Atack, Margo, Rhode, DAE 2014; JEP 2019

Second Industrial Revolution (1890-1920)

Inventions:
- Electricity
- Chemical/metallurgy

(e.g. Bessemer process; fractional distillation)
- Interchangeability of parts

Large capital investments allowed for:
- Automation (assembly line)
- Batch/continuous processing

Replaced low-skilled workers
- Carrying
- Fitting

Required skilled technicians and white collar workers

Quest for interchangeable parts

Colt revolver, c. 1850

"In Mass Production there are no 'fitters.'" – Henry Ford

- Interchangeability – parts can be freely exchanged between any two products without custom fitting
- Idea first developed in armament industry (useful on battlefield)
- Demonstration to the British in 1850s: Take ten guns apart and collect parts into separate boxes. Reassemble into ten "new" guns that work!
- True interchangeability only achieved with high quality steel. At time, "fitters" were needed to file down parts

In metal working: Automation on the first assembly line

Ford plant, c.1913

"The man who puts in a bolt does not put on the nut. The man who puts on the nut does not tighten it." – Henry Ford

In food, chemicals, dyes: Continuous and batch processing

Example: Flour milling

First Industrial Revolution

Second Industrial Revolution

Second Industrial Revolution technology increased the relative demand for skill (Goldin and Katz, 1998)

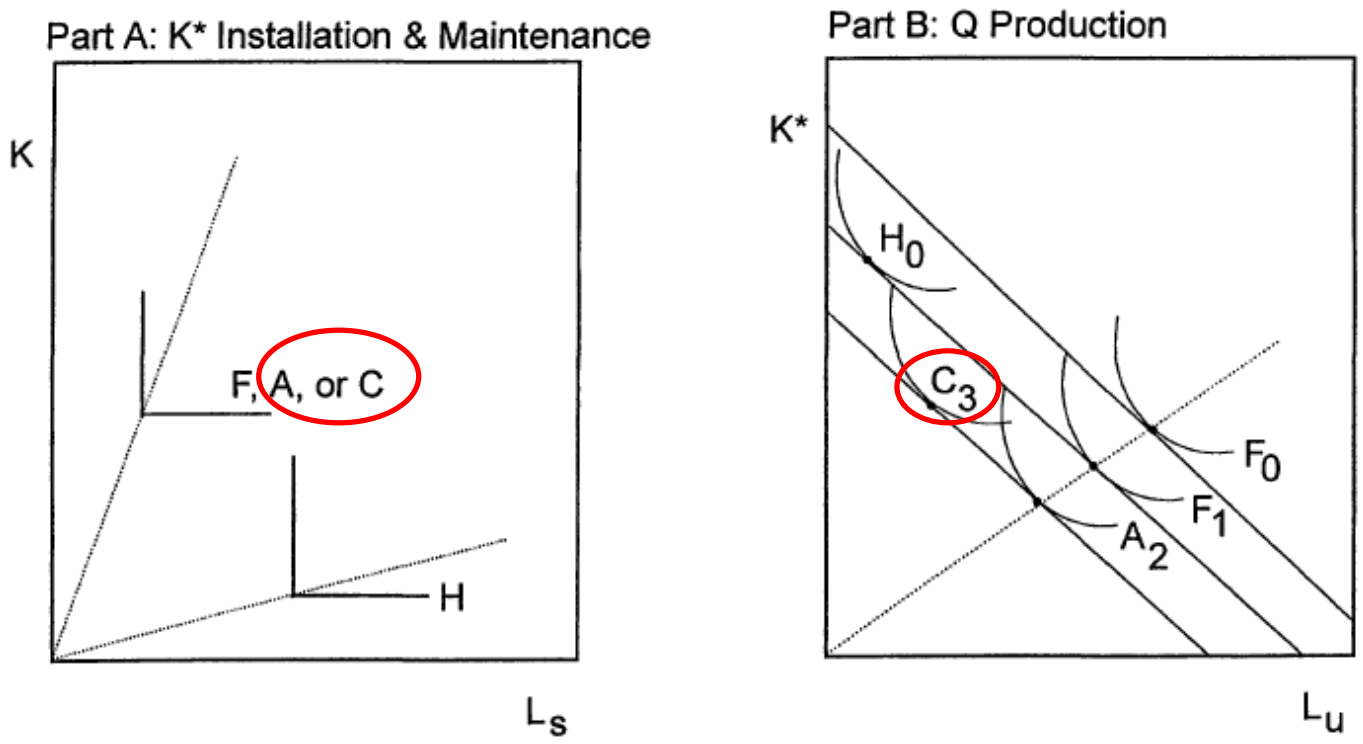


FIGURE I
A Simple Framework for Understanding the Relationships among Capital, Technology, and Skill

H = hand production
F = factory
A = assembly line
C = continuous batch

Two steps in production process
(a). Install machines
(b). Produce

Or polarization? (Katz and Margo, 2014)

- Rising demand for skilled technicians ****and white collar****
- Rising demand for basic assembly line
- But falling demand for mid-skill artisans

How did supply respond? Growth in high school graduation, 1890-1970

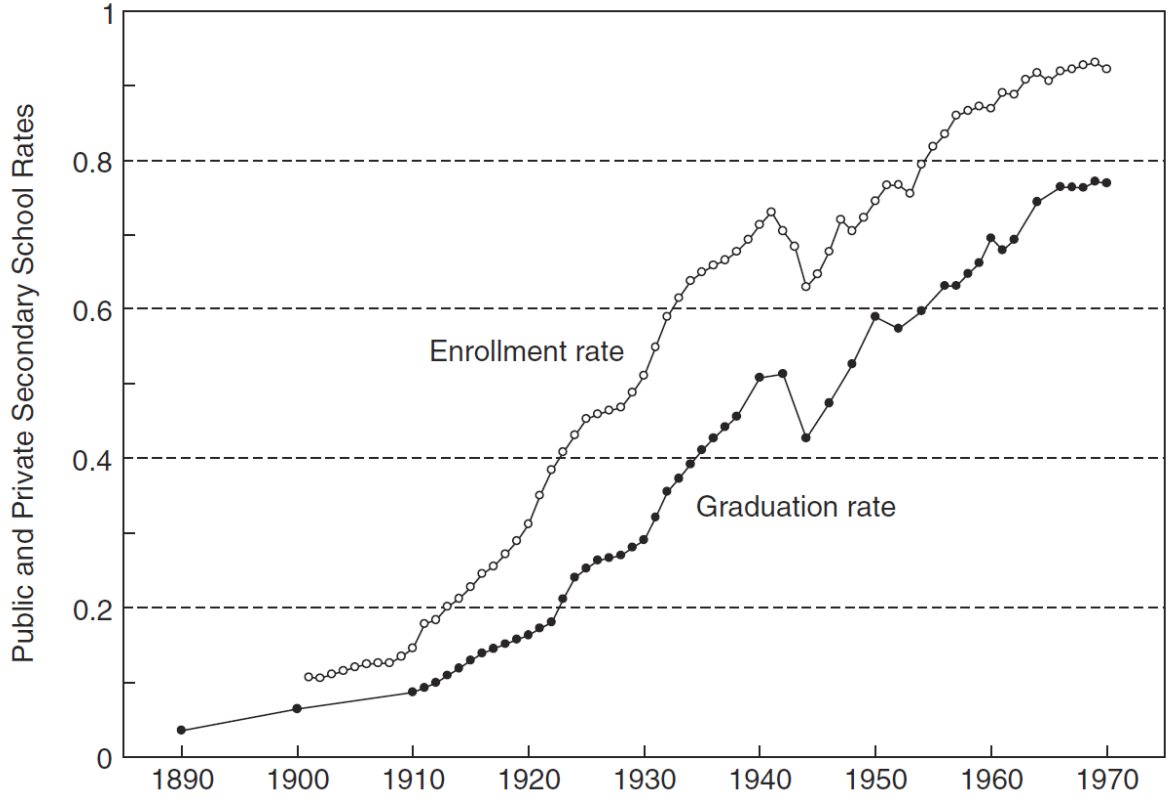


Figure 6.1. Secondary School Enrollment and Graduation Rates: Entire United States, 1890 to 1970. Enrollment numbers are divided by the number of 14- to 17-year-olds; graduation figures are divided by the number of 17-year-olds. Males and females in public and private schools are included. Year given is end of school year. Sources: U.S. Department of Education (1993) and Goldin (1998) for 1910 to 1930 graduation rates.

Small effects of compulsory schooling laws on attendance, but otherwise household decision to invest in children

TABLE 5— EFFECTS OF EDUCATION LAWS ON THE ENROLLMENT AND EMPLOYMENT OF NATIVE AND IMMIGRANT CHILDREN AGED 6–16, 1910–1930 (*Probit regression with marginal effects reported*)

Dependent variable:	In school=1			Employed=1		
Sample:	Foreign born	Second generation	Native parents	Foreign born	Second generation	Native parents
Panel A. All ages 6–16						
Should be in school by law=1	0.048 (0.018)**	0.020 (0.008)*	0.022 (0.005)***	−0.053 (0.021)*	−0.033 (0.010)**	−0.033 (0.005)***
Continuation law=1	0.012 (0.012)	0.010 (0.005)	0.002 (0.006)	0.002 (0.020)	−0.006 (0.006)	0.003 (0.004)
English law for all schools=1	−0.014 (0.013)	0.006 (0.007)	0.010 (0.006)	−0.010 (0.015)	−0.006 (0.003)*	−0.005 (0.004)
Observations	19,356	121,947	423,017	19,320	156,427	423,000
Mean of *Y*	0.818	0.891	0.885	0.139	0.068	0.074

"Should be in school" combines entry age and work permit age

School requirements increased attendance by 2-6% (more for immigrants)

Source: Lleras-Muney and Shertzer, *AEJ*, 2015

Returns to education were high in 1915 (in Iowa…) before high school movement and low by 1940

TABLE 1
RETURNS TO EDUCATION BY TYPE OF SCHOOLING AND OCCUPATION, 1914: MALES, BY AGE

Type of School, in Years	Type of Occupation				
	All	Nonfarm	Farm	Nonfarm White-Collar	Nonfarm Blue-Collar
	Males, 18 to 65 years				
Common school	0.0427	0.0400	0.0375	0.0275	
Grammar school	0.0533	0.0647	0.0232	0.0470	
High school	0.103	0.102	0.114	0.0609	
College	0.103	0.106	0.132	0.0783	

Source: Goldin and Katz, *JEH*, 2000;
Feigenbaum and Tan, *JEH*, 2020

Table 4: The Return to Education: Baseline

	1940 1% Sample			Twins, Pooled			Twins, Family FE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years of Education	0.046*** (0.000)	0.055*** (0.000)	0.038*** (0.001)	0.050*** (0.001)	0.056*** (0.001)	0.036*** (0.002)	0.044*** (0.002)	0.035*** (0.002)
Good Controls	No	Yes	Yes	No	Yes	Yes	No	No
Bad Controls	No	No	Yes	No	No	Yes	No	Yes
Twin Family FE	No	No	No	No	No	No	Yes	Yes
Observations	191110	191110	191110	38652	38652	38652	38652	38652
Adjusted R2	0.08	0.30	0.34	0.09	0.23	0.29	0.42	0.44
Y Mean	3.20	3.20	3.20	3.27	3.27	3.27	3.27	3.27

Note: All columns present regressions of the log of weekly earnings in 1939 on years of education, drawing on the 1940 census. In columns 1, 2, and 3, we use a random 1% sample of the 1940 census. In columns 4, 5, and 6, we turn to our linked sample of twin brothers, linking twins from the 1900, 1910, and 1920 censuses to 1940. In columns 7 and 8, we include twin family fixed effects, forcing the comparisons of earnings and education to be between twin brothers. With the twin family fixed effects, the "good" controls—age, age-squared, race, and nativity—are subsumed because they cannot vary between twins. In all cases our sample is restricted to wage and salary male workers with a weekly wage of at least $6, who worked a positive number of weeks in the previous year (1939), and who worked a positive number of hours in the previous week. The twins sample

Electrification increased demand for white collar work; lowered demand for routine work

2nd IR industries have highest rates of high school graduation

Aircraft: 52.7%...Petroleum: 43.3%; Dairy: 43.2%

Compare to: Cotton textiles: 10.8%, etc.

At industry level, regress % with high school degree on log(K/L) and log(electricity/L)

Coefficients = 0.059 and 0.036, respectively

Table 4
Baseline OLS results.

	Dexterity/manual		Clerical/dexterity	
	Full sample	Product. Workers	Full sample	Product. Workers
Elecrate	−.23***	−.22***	.30***	.31***
	(.06)	(.07)	(.08)	(.10)
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R^2	.85	.86	.86	.84
Obs.	250	250	250	250

- Each occupation assigned index of task type
- Data from US Employment Service (1930s/40s)
- As electrification in state increased, mid-skill jobs fell relative to both high and low skilled jobs = polarization

Source: Goldin and Katz, QJE 1998;
Gray, *EEH* 2013

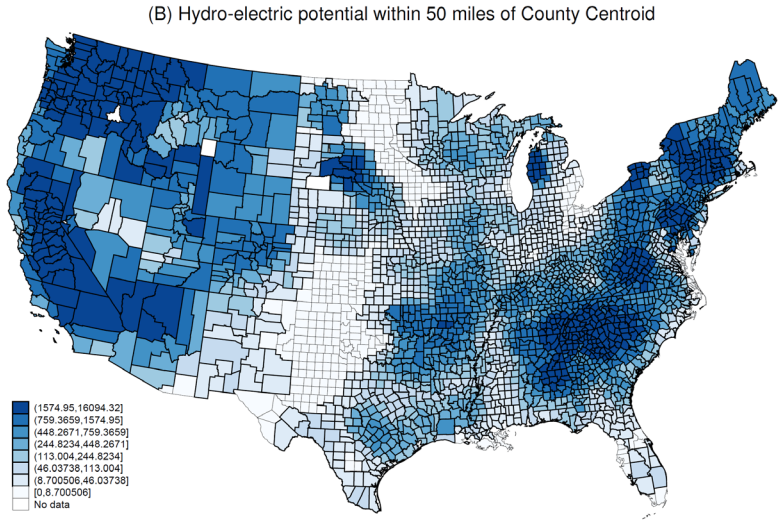
New data on opening of rural power plants

- Outcomes: Agricultural and non-agricultural employment, farm values
- Same could be done with firms located in cities? (I asked myself…)

Fig. 2. Large power plant openings, 1930–1960. Notes: The figure reports the location of large power plants (>30 MW of nameplate capacity). Red triangles identify power plants in operation in 1930. Blue circles identify power plants that opened between 1930 and 1960.
Source: Federal Power Commission (1963).

Source: Lewis and Severini, *JDE* 2020

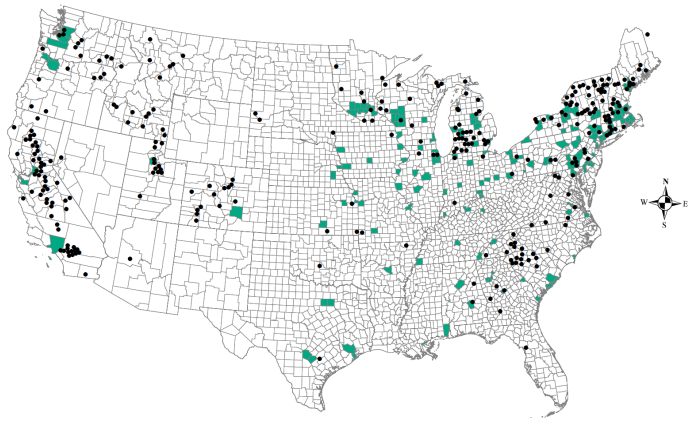
New papers on electrification in cities



- Transmission lines from Army Corp Engineers
- Predict based on suitability for hydropower – developed from terrain and water volume
- Can explain 50% of increase in operatives and 20% of decrease in farmers at county level, 1910-40

Gaggl, NBER WP 2019

Figure 1: Location of hydropower plants with 1,000 or more horsepower in 1912 and counties included in our sample (1920 county boundaries shown)



- Proximity to hydropower interacted with energy intensity of industry → within city variation
- 75th %-ile industry increases labor productivity by 10% relative to 25th %-ile industry when close to power

Fizbein, et al., NBER WP 2020

Additional findings on education: Children of high-income fathers benefited more from new schools

- Annual Reports of Superintendents data – more could definitely be done with this source!
- Graded classrooms, spending, pupil/teacher ratios in school district
- Adding a grammar school and high school to a district would increase schooling for son at 90th percentile by ¼ year, and hardly affect son at 10th percentile at all

Table 11: Ordered probit regression coefficients, son's educational attainment as dependent variable

Dependent variable	Total years of schooling	Years of high school
Graded classrooms per square mile	-2.934***	-3.259***
	(.500)	(.938)
(Graded classrooms per square mile)^2	.297***	.320***
	(.056)	(.098)
Log(spending per student)	.090	2.425**
	(1.104)	(1.146)
Log(tuition)	-.322	-1.744
	(1.849)	(1.812)
Father's log earnings	.015	.683
	(.360)	(.486)
Father's log earnings	.453***	.501***
x graded classrooms per square mile	(.065)	(.122)
Father's log earnings	-.045***	-.048***
x (graded classrooms per square mile)^2	(.065)	(.013)
Father's log earnings	.012	-.282
x log(spending per student)	(.176)	(.197)
Father's log earnings x log(tuition)	-.044	.196
	(.245)	(.254)
Rural dummy	.022	.178
	(.231)	(.698)
Number of observations	975	974
Pseudo R-squared	.030	.060

* significant at 10%; ** significant at 5%; *** significant at 1%

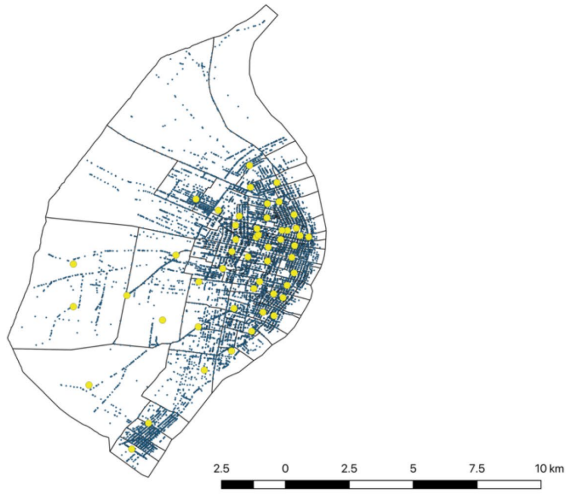
Notes: Total years of schooling is years beyond the required minimum of eight. Both total years of schooling and years of high school are rounded to the nearest year.

Sources: See text.

Source: Parman, *JEH* 2011

New work on kindergarten movement – good example of digging up new data

Figure 2:
Location of Public Kindergartens and Households in St. Louis 1880

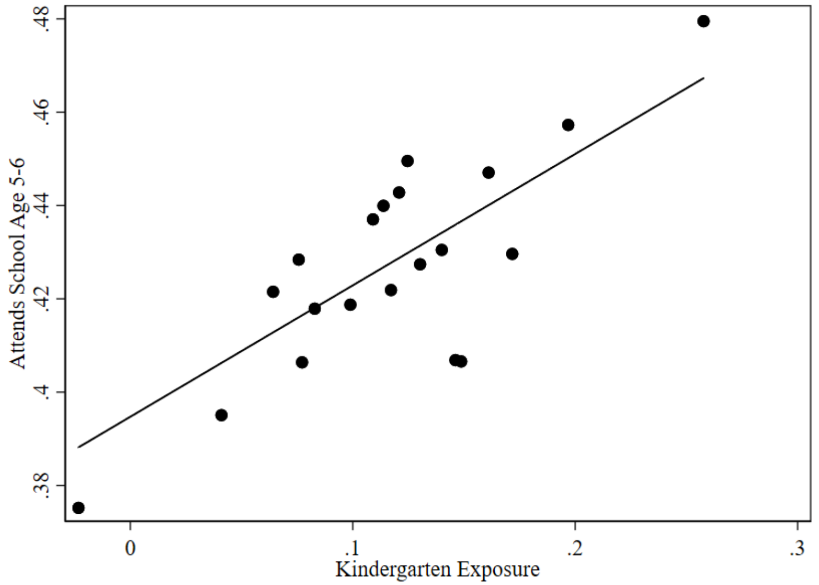


Experiments with first public kindergartens in the country in St. Louis, 1870s and 1880s

Detailed information on school location and opening dates in city's annual reports allows event studies

Source: Ager and Cinnirella, WP 2021

Appendix Figure 6:
Kindergarten Exposure and Attendance in American cities



Second half of the paper uses schools data from US Bureau of Education reports, Kindergarten Circular + info on grammar and high schools at district level

Outcomes from Census on school attendance & fertility

Second lap of "race" between education and technology
(Examples from manufacturing…)

(1) Metal parts in machine tool shop

Numerically controlled machine tools c. 1975

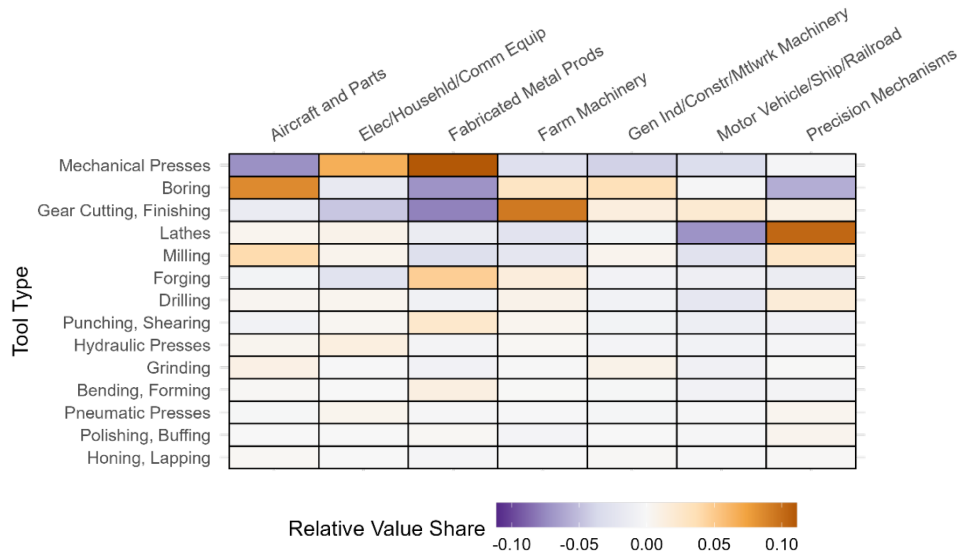
(2) Assembly

Industrial robots, c. 2000

Measuring exposure to numerical control shock

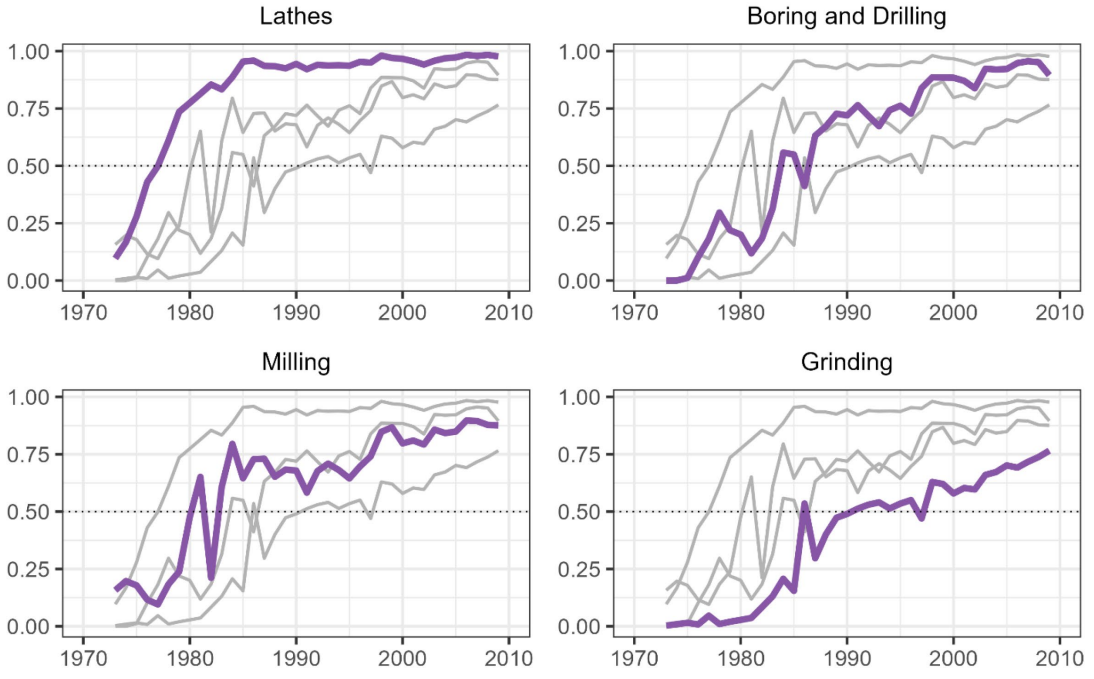
Boustan, Choi and Clingingsmith 2022

Figure X: Value Share by Industry of Installed Tools Relative to Tool Mean Across Industries in 1958



Data from Eighth American Machinist Inventory of Metalworking Equipment, 1958

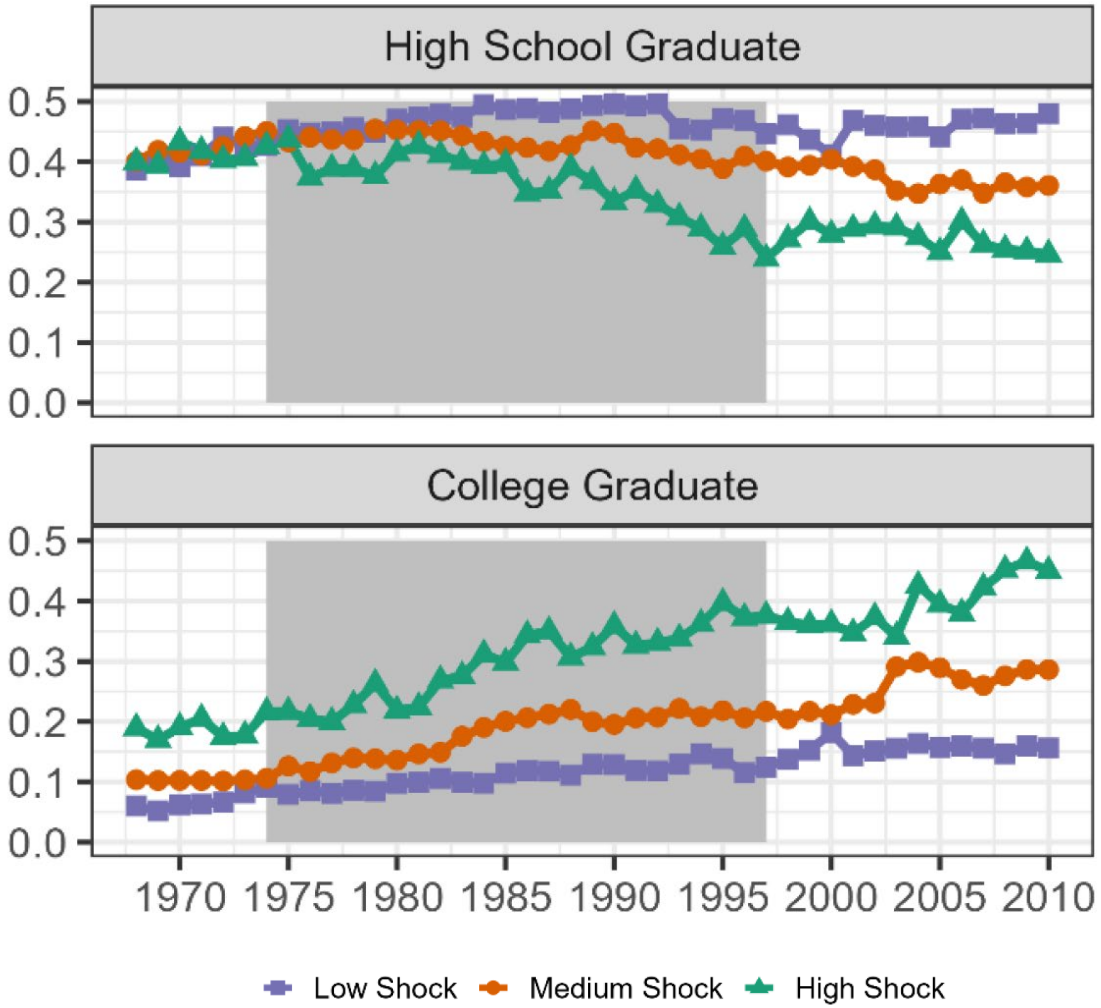
Figure X: NC Share by Machine Tool Type for Japan



Economic Handbooks of the Machine Tool Industry

→ Combine into a shift-share measure of exposure

High exposure industries shifted away from high school graduates toward college graduates

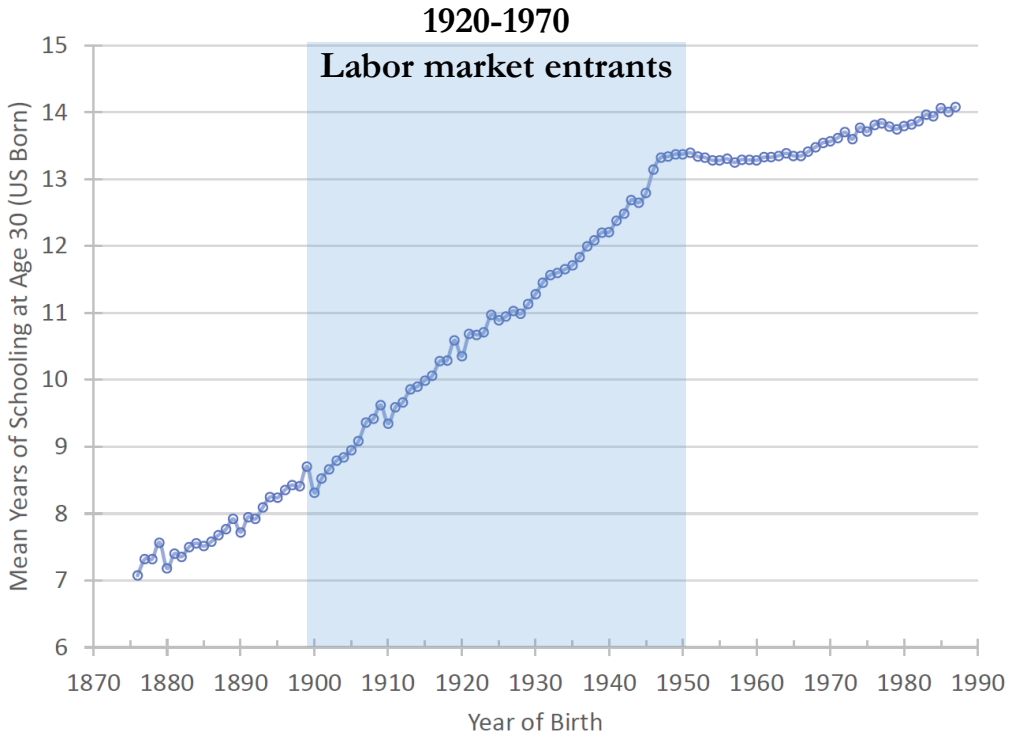


Shock also associated with higher productivity in exposed industries

Exposed workers more likely to join/remain in union; more likely to go back to school

Computerization increased demand/wages for skill. Yet education response has not kept pace (why?)

Figure 2: Mean Years of Schooling at Age 30 for the U.S. Born, 1876 to 1987 Birth Cohorts



Sources and Notes: US Census IPUMS data from 1940 to 2000 and CPS MORG data from 2005 to 2018. The figure updates Goldin and Katz (2007, figure 7). See the on-line appendix for details.

Source: Autor, Goldin and Katz, AER P&P 2021

Contribution of expanding college attendance to rising education

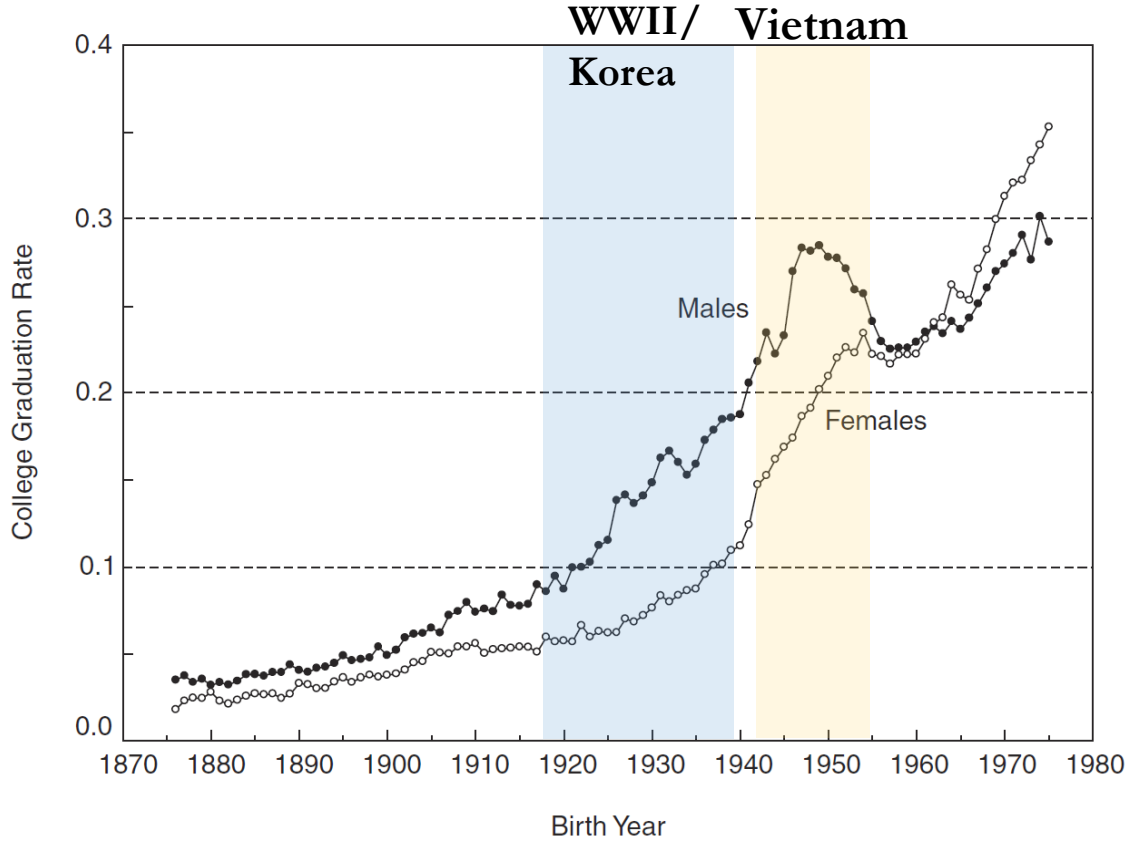


Figure 7.1. College Graduation Rates for Men and Women: Cohorts Born from 1876 to 1975 (by age 30). The figure plots the fraction of each birth cohort, by sex, that had completed at least four years of college by age 30 for the U.S.-born. Since educational attainment data was first collected in the U.S. population censuses in 1940, we infer completed schooling at age 30 for cohorts born prior to 1910 based on their educational attainment at older ages. Because we do not

TABLE I
COLLEGE COST REDUCTION DUE TO THE WORLD WAR II AN

	World War II (1948)	
Cost per academic year	*Private university*	*Public university*
Tuition and fees (dollars)	402	102
Opportunity cost (dollars)	1390	1390
Total cost (dollars)	1792	1492
GI bill subsidy per academic year, by family composition		*Subsidy in*
No children	1077	777
1 child	1347	1047
≥2 children	1482	1182
		Subsidy as a percer
No children	60	52
1 child	75	70
≥2 children	83	80

Source: Goldin and Katz, Stanley *QJE* 2003

Estimating the effect of the GI bill on college attendance

- Use birth cohort variation. Men born after the 3rd quarter of 1927 were too young to serve in WWII
- Simple comparison of vet/non-vet = 10pp difference in college graduation; Using birth cohort as instrument for veteran status = 3pp
- College completion rose 10pp from 1920-30; GI bill explains 1/3

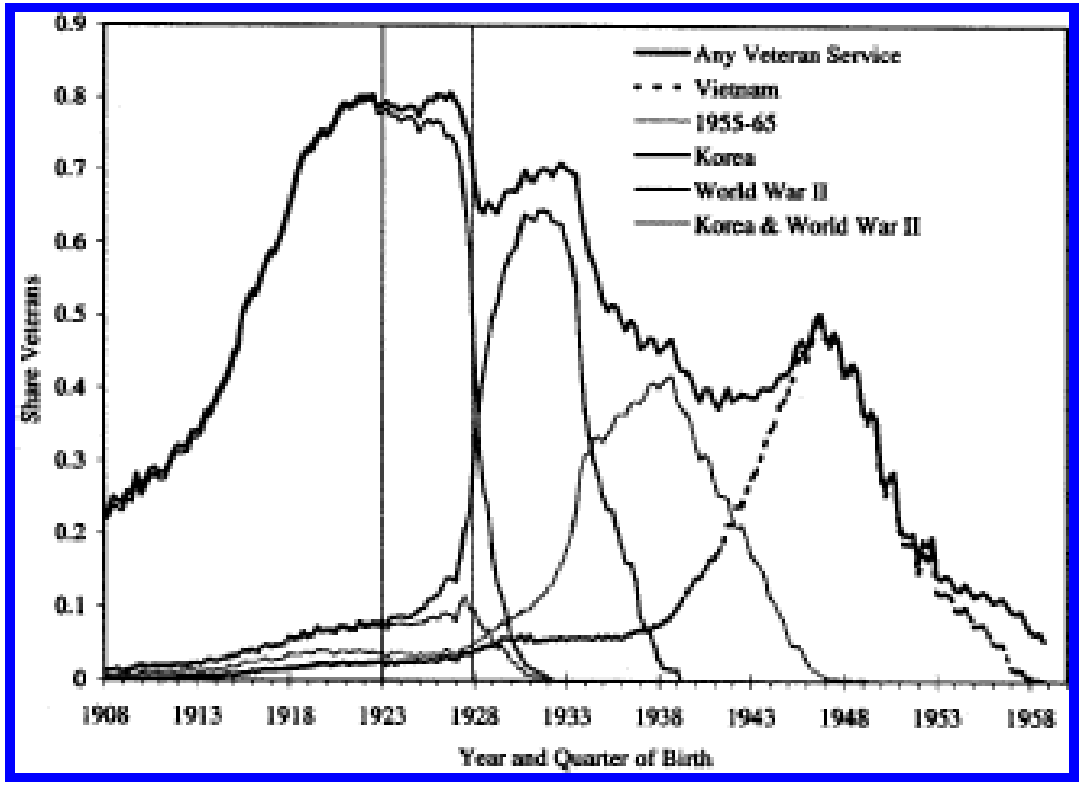
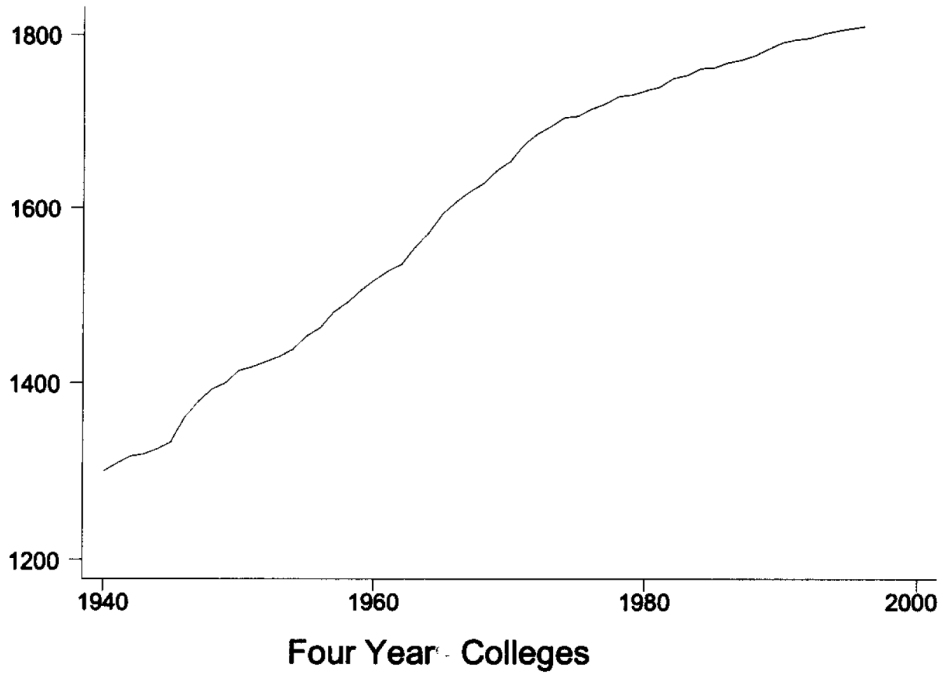


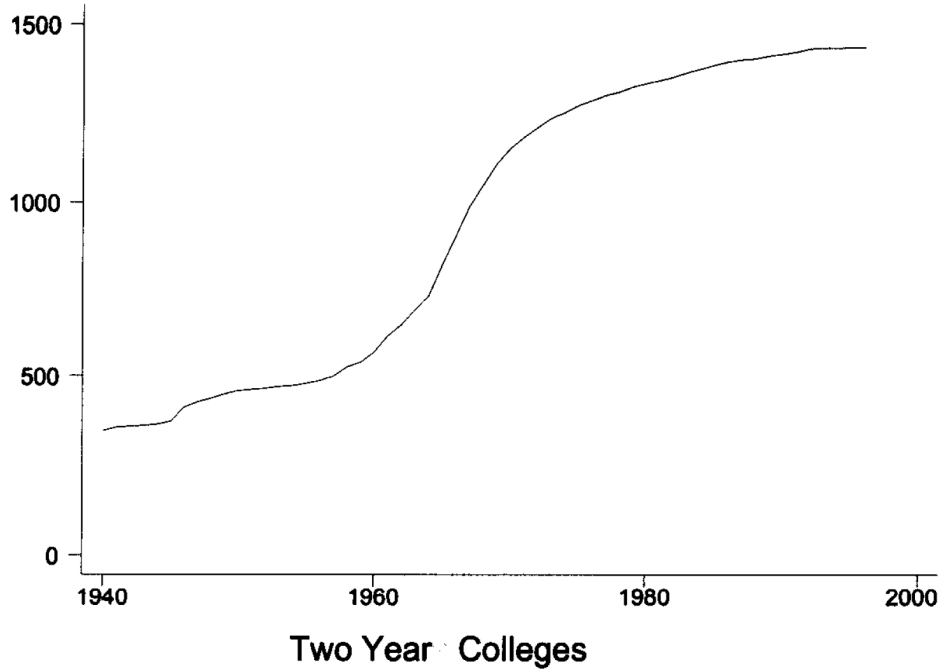
FIG. 1.—Share of each birth cohort with veteran status or serving in military conflict. Sample includes white men born between 1908 and 1958. The 1980 census separately delineates the 1955–65 period of service, whereas the 1970 census does not. Source: Data are from a 5% sample of the 1980 decennial census.

Source: Bound and Turner, 2002

Did college capacity respond? Data on new college openings

Figure 1: Number of Four and Two Year Colleges





Source: Currie and Moretti, *QJE* 2003 (outcome variable = birth outcomes)
Constructed detailed data on college openings dates from HEGIS, IPEDS and guides/internet searches

Adding labor market institutions to the "race between education and technology" framework

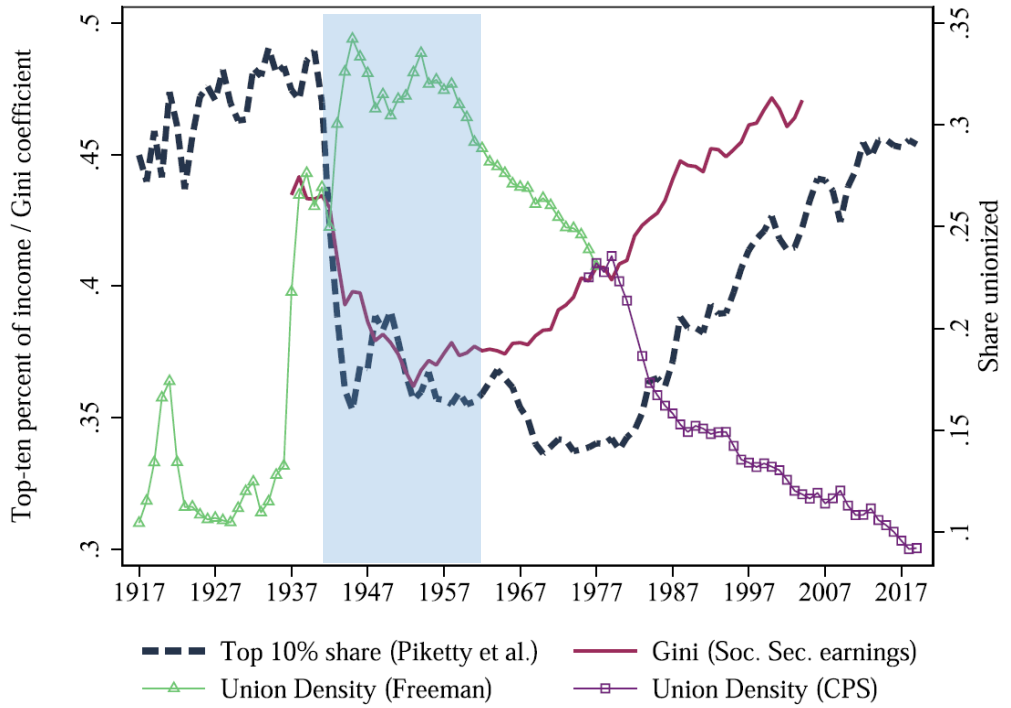


FIGURE I

Union Density and Inequality Measures, 1917–2019

Top-share individual income inequality is from Piketty, Saez, and Zucman (2018). Union density is the number of unionized workers as a share of the nonagricultural workforce from Historical Statistics of the United States, together with individual union density as a share of employed civilian workers ages 16 to 65 from the Current Population Survey. We discuss these data sources in detail in Section II.B

Source: Farber, Herbst, Kuziemko, Naidu, *QJE* 2021

Union wage premium remains around 10-15% - moderates wage fluctuations at mid-century

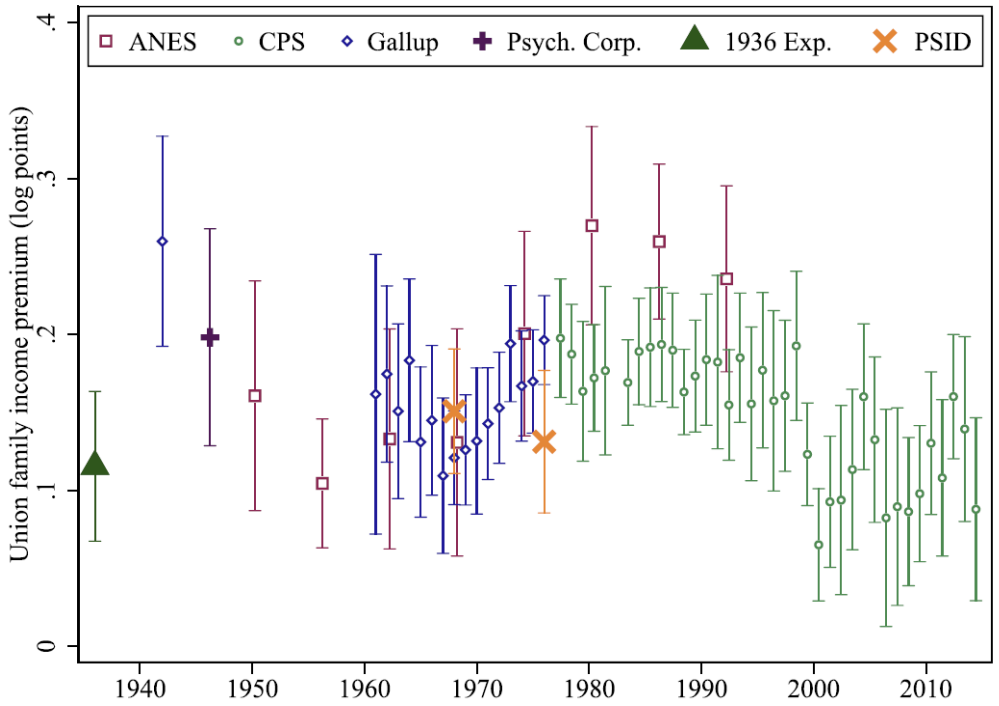


FIGURE V

Estimates of the Union Family Income Premium

Each plotted point comes from estimating equation (2), which regresses log family income on household union status, with controls for years of schooling (harmonized into four categories corresponding to 10, 12, 14, and 16 years), age, gender, race, and state and survey-date fixed effects. Whenever possible we also include

by state. Gallup data, 1942, 1961–76; CPS, 1977–2014; BLS Expenditure Survey, 1936; ANES, 1952–96, U.S. Psychology Corporation, 1946; Panel Study of Income Dynamics, 1968, 1976. See Section II.B for a description of each data source. See Online Appendix C for details on CPS family-income variable construction.

Lecture 3: Black-white economic convergence

- After Emancipation, slow black-white income convergence from 1880-2020. Only two periods of more rapid progress: 1940-50; 1965-75

- Causes of convergence:
  - Human capital investment (supply): Migration to higher-wage North; Investments in more - and better quality - education
  - Episodic change (demand): World War II; Civil Rights movement

- Review an old debate with new evidence, then look at emerging research trends (intergenerational mobility, incarceration, wealth gap)

Smith and Welch 1989

Decompose sources of wage gains, 1940-80

Can explain at least half of gains: Migration, education and southern economic growth

Donohue and Heckman 1991

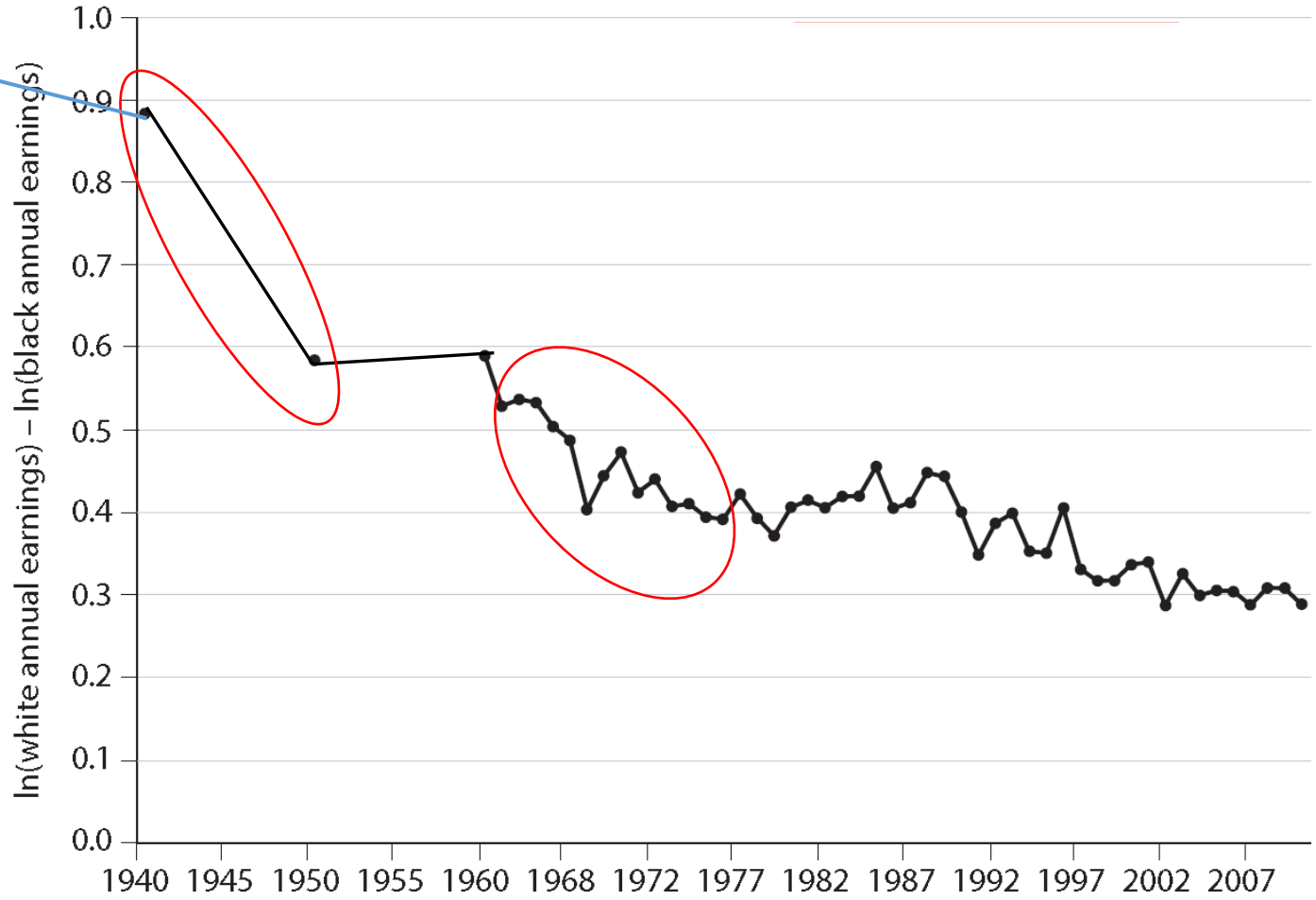
But most of the gains occurred in concentrated bursts!

Gains were widely shared across age groups – not restricted to new labor market entrants (suggests labor demand shock, not rising education by cohort)

Decomposition does not get at underlying mechanisms. *Why* did black workers share in southern economic growth now, unlike before? Role of federal government

Black-white earnings gap, 1940-2010

If use occupation-race-region cells for estimates, earnings gap in 1880 = 1.2 log points (Margo, 2016)



Source: Boustan, 2016

New insights by moving beyond means
Bayer and Charles, QJE 2018

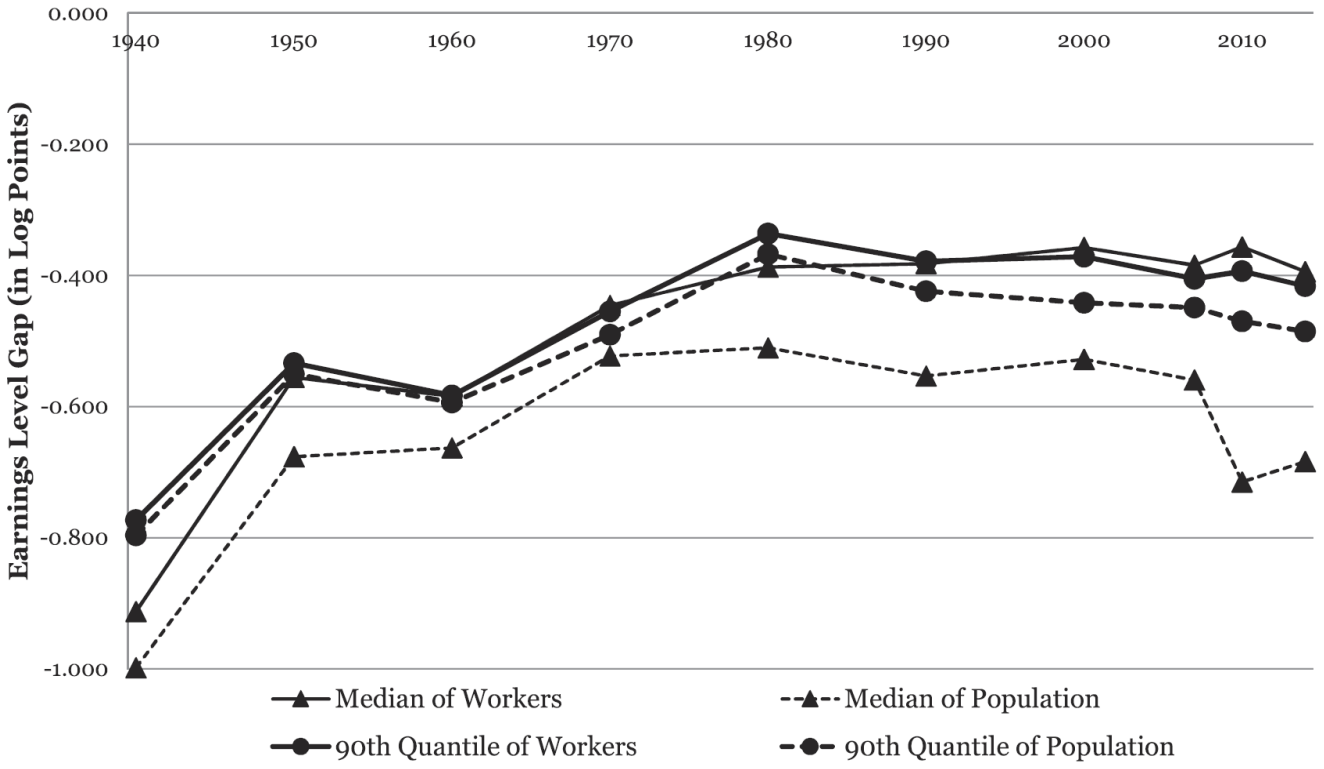


FIGURE IV

Racial Earnings Level Gap, Workers and Population, Median and 90th Quantile

Figure displays earnings level gap, measured in log points, for the median and 90th quantile for non-Hispanic black and white men aged 25–54. Gaps are reported for the sample of workers and the population of all men, including nonworkers.

1. **Workers vs. population**: 20% of white men and 35% of black men (25-54) are not employed! If include this group, levels *and* gains diminish

2. **Median vs. 90th percentile**:
- Shared gains 1940-70. For median, due to Great Compression. Stasis after 1970 due to rising inequality (no positional gains)

- For 90th, gains continued from 1970-90. Black college graduates rose in income rank

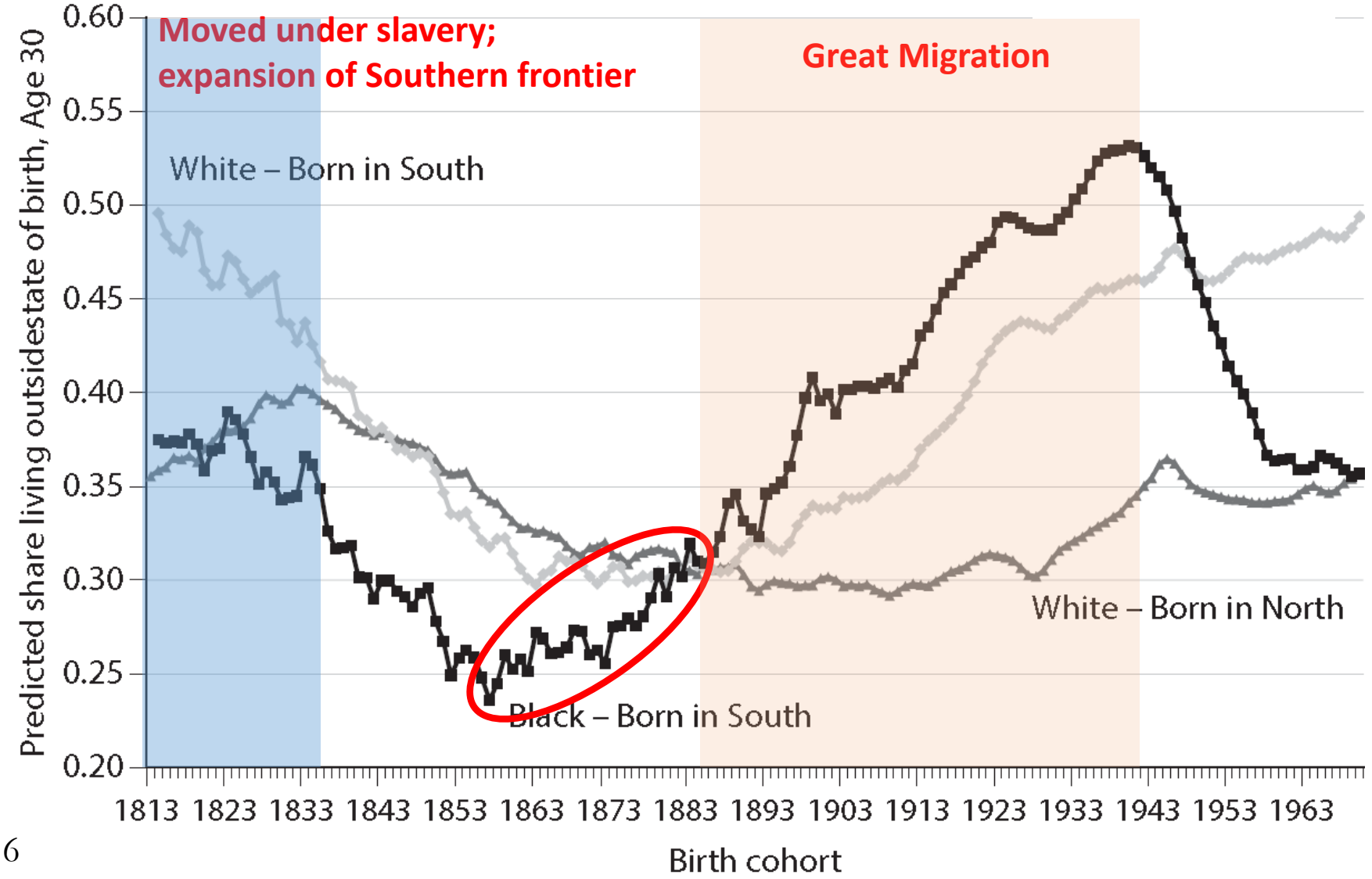
Following Smith and Welch, how far can we go with supply side? Start with migration from low-wage South

- In 1910, 90% of black population in South (28% of whites); migration to North begins c. 1915

- South was low-wage, agricultural region
  - In 1900, for black household heads in the rural South: 15% farm owner; 22% cash tenant; 23% share tenant; 28% farm labor; 12% other (Wright, 1986)

- Why didn't black southerners leave earlier? Old view = tied to land by tenancy contracts. But, there was substantial mobility *within* South!
  - High migration costs without network in North so low migration equilibrium can persist. 1915 = World War I labor demand, loss of immigrant labor supply, Boll weevil in South (see Carrington, et al., 1996; Collins, 1997; Lange, et al., 2007)

Rising mobility before, but Great Migration was truly "great"



Source: Boustan, 2016

Contribution of migration to black wage gains [decomposition]

(Easier to decompose black wage growth = ~200 log points from 1940-1980 than B/W ratio)

- Share living in South fell from 0.75 to 0.53 from 1940 to 1980

- Wage penalty for living in South = 100 log points in 1940; down to 20 l.p. in 1980

* 1940 estimates from Boustan (2016) comparing linked brothers

- Direct effect of migration: price in 1940 x (Δ quantity)

  100 l.p. x (0.75-0.53) = **22 l.p. or ~10% of total**

- Southern economic growth benefited black residents who stayed

  Δ price x (quantity in 1980): 0.53 x [100 l.p.-20 l.p.] = **42 l.p. or ~20% of total**

A comment: Southern economic growth could be driven, in part, by the migration itself

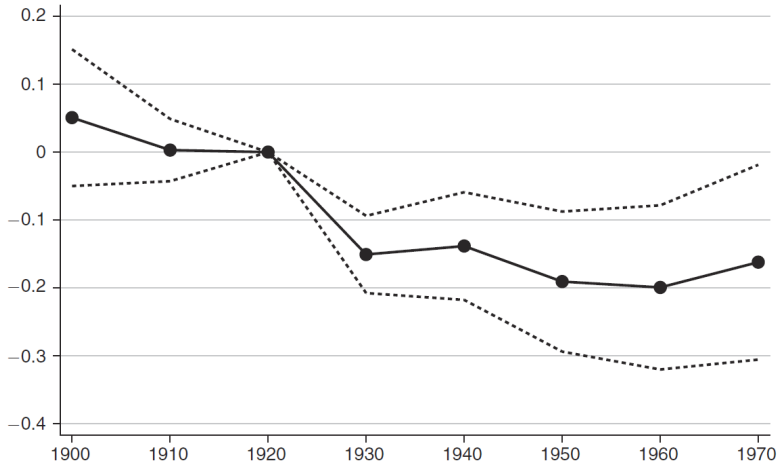


FIGURE 3. ESTIMATED DIFFERENCES IN BLACK POPULATION IN FLOODED COUNTIES, RELATIVE TO 1920

Notes: This graph reports estimated differences in log black population share between flooded counties and nonflooded, relative to differences in 1920. From estimating equation (5) in the text, the outcome is regressed on the fraction of the county flooded, state-by-year fixed effects, and county fixed effects. The dashed lines indicate 95 percent confidence intervals, based on robust standard errors clustered by county.

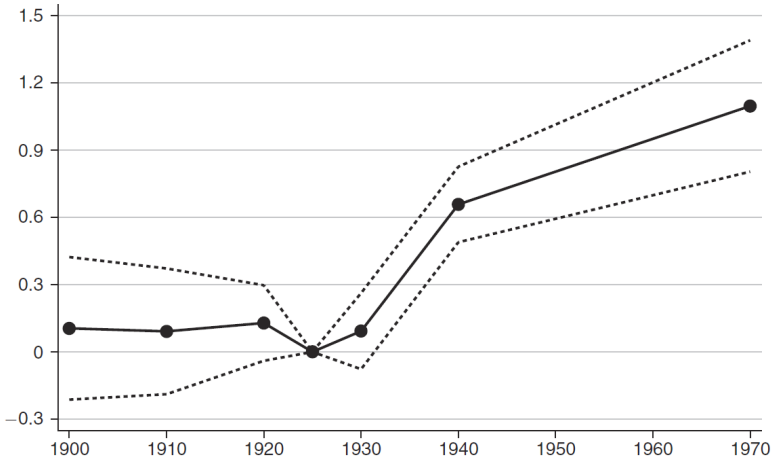


FIGURE 4. ESTIMATED DIFFERENCES IN FARM CAPITAL IN FLOODED COUNTIES, RELATIVE TO 1920

Notes: This graph reports estimated differences in log value of farm equipment and machinery between flooded counties and nonflooded, relative to differences in 1925. From estimating equation (5) in the text, the outcome is regressed on the fraction of the county flooded, state-by-year fixed effects, and county fixed effects. The dashed lines indicate 95 percent confidence intervals, based on robust standard errors clustered by county.

Source: Hornbeck and Naidu, AER 2014

<u>The story</u>: After 1927 Mississippi flood, black workers left flooded region (in AR, MS, LA, TN)
Farmers lost source of cheap labor. Shifted to mechanized agriculture (e.g., tractors). Farm size increased

Supply side part #2: Low human capital

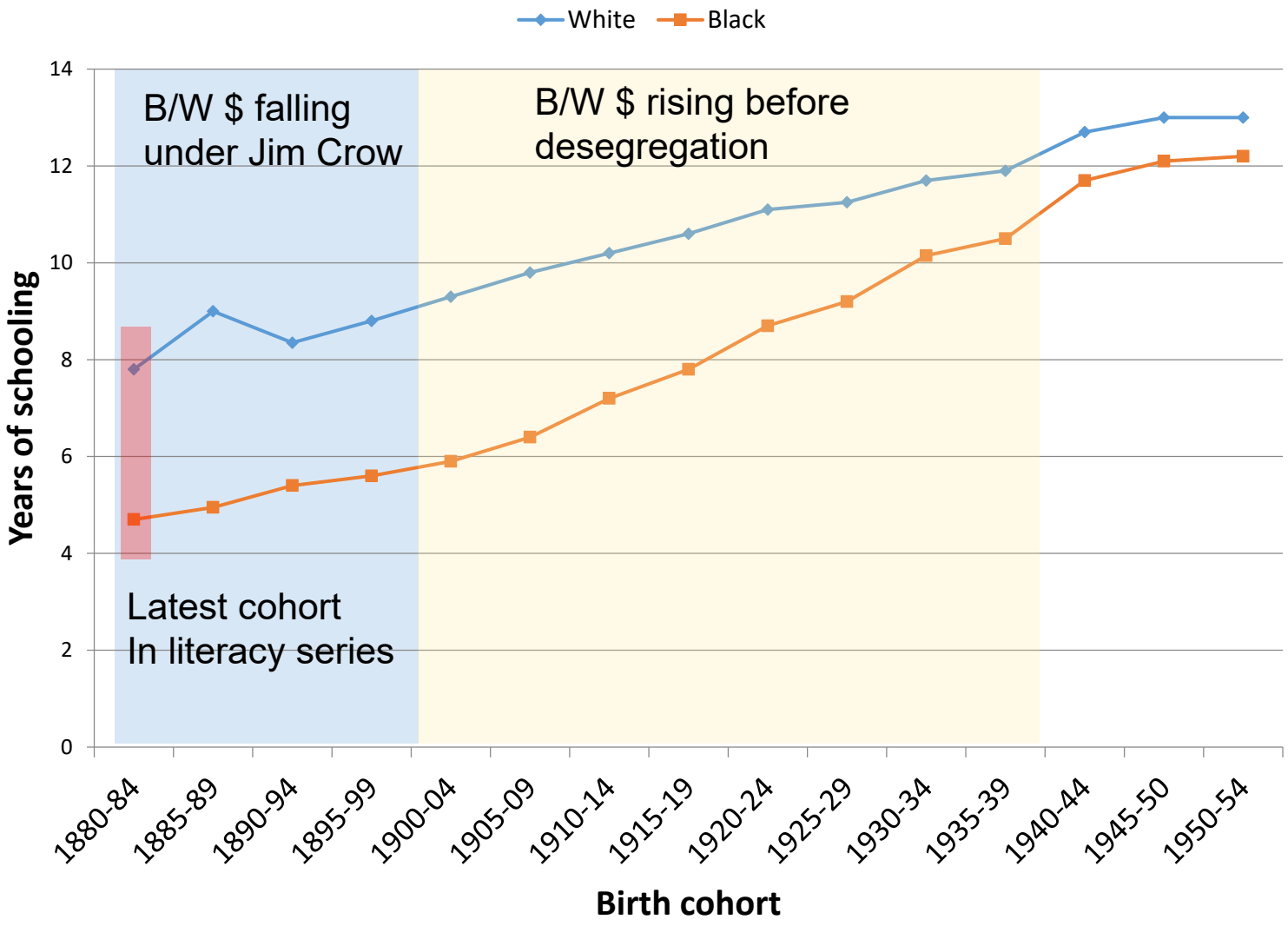
Share illiterate by race

	DURING SLAVERY	DURING WAR	AFTER SLAVERY	AFTER SLAVERY	AFTER (Educ $ falls)
Cohort "in school" in:	1850-60	1860-70	1870-80	1880-90	1890-1900
Black	0.812	0.656	0.373	0.247	0.186
White	0.100	0.083	0.047	0.052	0.033

Source: Collins and Margo, *Handbook on Economics of Education* (2006)
Note: Data for individuals age 20-30 in relevant Census year

- Forbidden to teach a slave to read (and little incentive to do so) before Civil War
- During Reconstruction, spending on black schools increased (1865-1877) – see Logan (2018) on black politicians
- Federal government withdraws; black residents lose *de facto* right to vote c. 1890
- Investment in black schooling slows (Margo 1990)
  - e.g. in AL, black/white ratio of school spending: 0.99 in 1890; 0.31 in 1910; 0.76 in 1950
- Why does spending rise 1910-50?: Rosenwald schools; "voting with your feet"; shadow of "separate but equal"

Education: Years of schooling completed by birth cohort



School quality/quality interact to reduce black-white wage gap

Table 4
Estimates of Black-White Labor Market Outcome

	Out			
	ln(Weekly Wage)			
	(1)	(2)	(3)	(4)
Unconditional gap (SE)		−.529 (.024)		
Black-white gap	−.490	−.315	−.181	−.191
	(.022)	(.022)	(.031)	(.032)
Contribution of school quality			−.140	−.011
			(.022)	(.046)
Contribution of educational attainment			−.168	−.164
			(.010)	(.011)
Contribution of interaction				−.123
				(.043)
Age and county controls?	Yes	Yes	Yes	Yes
Years of schooling?	No	Yes	Yes	Yes
School quality?	No	No	Yes	Yes
Interacted HC controls?	No	No	No	Yes
N	11,394	11,394	11,394	11,394
Adjusted R^2	.24	.29	.30	.30

Source: Carruthers and Wanamaker, JOLE 2017

Role of education in black wage growth, 1940-80

(1) Increase in years of schooling at initial return earned by black workers (1940):

4 l.p. x [10-6yrs] = 16 l.p.

(2) Increase in returns to schooling (= school quality?) at 1940 education gap:

6yrs x (7 l.p. - 4 l.p.) = 18 l.p.

(3) Interaction term = Each year of schooling worth more over time

[10-6yrs] x (7 l.p. - 4 l.p.) = 12 l.p.

Overall value of education = 46 l.p. or ~25%

(Compare to overall value of migration = 10%; southern economic growth = 20%)

Beyond human capital: No land/wealth redistribution in the South. Compare to Cherokee nation

TABLE 4.—FARM OWNERSHIP IN THE CHEROKEE NATION AND THE SOUTH, 1880

1880

	Farmers Who Owned Land (%)		Male Household Heads Who Were Farmers (%)		Implied Farm Ownership Rate (%)	
	Black	White	Black	White	Black	White
Cherokee Nation	100	100	67.8	70.4	67.8	70.4
South	28.4	73.7	43.4	70.7	12.3	52.1

Source: Data are from 1880 Cherokee Census sample, 1880 IPUMS (Ruggles et al., 2019), and Ransom and Sutch (2001) sample. South includes all states that joined the Confederacy except Arkansas.

1900

	A. School Attendance	
	1	2
Black	−0.25***	−0.14***
	[0.01]	[0.01]
Cherokee Nation	−0.10***	−0.13***
	[0.02]	[0.02]
Black × Cherokee Nation	0.16***	0.08*
	[0.03]	[0.03]

1st column controls for father characteristics; 2nd adds controls for soil quality

Source: Miller, ReStat 2020

Episodic change: Anti-discrimination during WWII

- Roosevelt established Fair Employment Practice Committee by Executive Order in 1941. Outlawed discrimination by race in defense industries during war
- 16 regional offices in 1943 to investigate complaints
- Provided some "cover" to managers who wanted to hire black workers. Appears to matter – but not in the South!
- Possible to redo with "event study"?

Source: Collins, AER 2001

TABLE 2—FEPC CASES AND CHANGE IN NONWHITE/WHITE DEFENSE EM

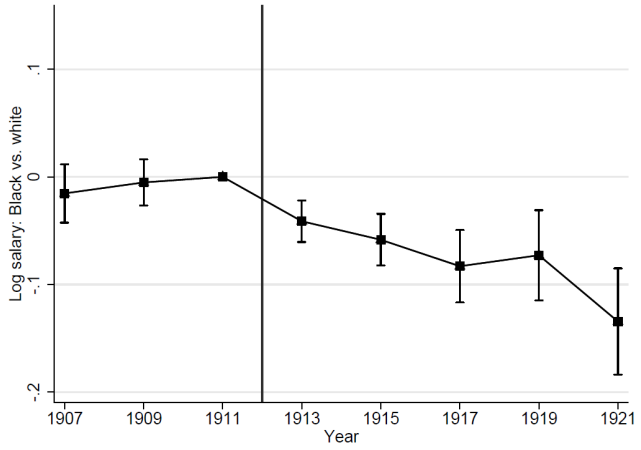
	(1) OLS	(2) OLS	(3) OLS
$(NW/W)_{1940\ defense}$	−0.5548	−0.5382	−0.4163
	(0.0922)	(0.0928)	(0.1070)
$(NW/W)_{1940\ population}$	0.2519	0.2396	0.1297
	(0.0601)	(0.0607)	(0.0801)
Defense/total employment	0.0699	0.0747	0.1838
	(0.0481)	(0.0481)	(0.0702)
Caseload 1–9	0.0014	0.0040	0.0117
	(0.0115)	(0.0117)	(0.0139)
Caseload 10–49	0.0360	0.0354	0.0523
	(0.0123)	(0.0137)	(0.0176)
Caseload 50–99	0.0268	0.0208	0.0411
	(0.0156)	(0.0183)	(0.0201)
Caseload 100–199	0.0504	0.0380	0.0562
	(0.0198)	(0.0238)	(0.0496)
Caseload 200+	0.0956	0.0926	0.1053
	(0.0218)	(0.0235)	(0.0283)

- DV = change B/W defense employment, 1940-44. Mean in 1940 = 0.08; mean change = 0.01
- Column 2 controls for NAACP membership; column 3 controls for war contracts; all control for city population and region; N= 129

The flip side: Segregation by race in federal government in 1910s

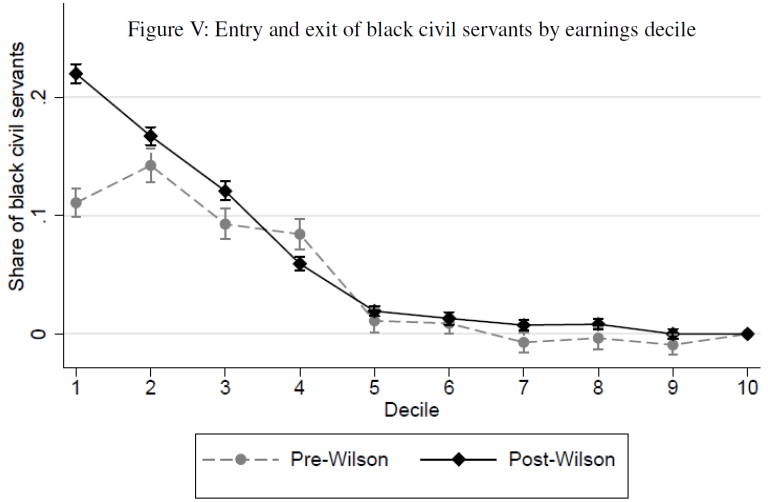
- President Wilson endorsed a policy of racial segregation in the federal government
- In practice, led to hiring freezes in higher levels of civil service; black workers were concentrated in lower-paid positions
- Digitization of 1.3 mil records from Official Register (name, job title, salary) and match to Census to determine race
- Look at long-run outcomes of these demotions

Figure II: Racial earnings gap around Woodrow Wilson's Presidency



Notes: The figure shows the black vs. white (log) earnings gap for matched black civil servants around Woodrow Wilson's inauguration ($t = 1913$), covering the sample period 1907–1921 (solid black line). Black and white civil servants are matched based on sex, department, bureau, age, salary, and whether the position is paid per annum or not in 1911. The specification corresponds to the regression of Table II, column 3, except that we allow the Black × Wilson coefficient to vary by each time period. The solid vertical black line delineates the pre-transition from the post-transition period. The 95% confidence intervals reported are based on standard errors clustered at the individual-level.

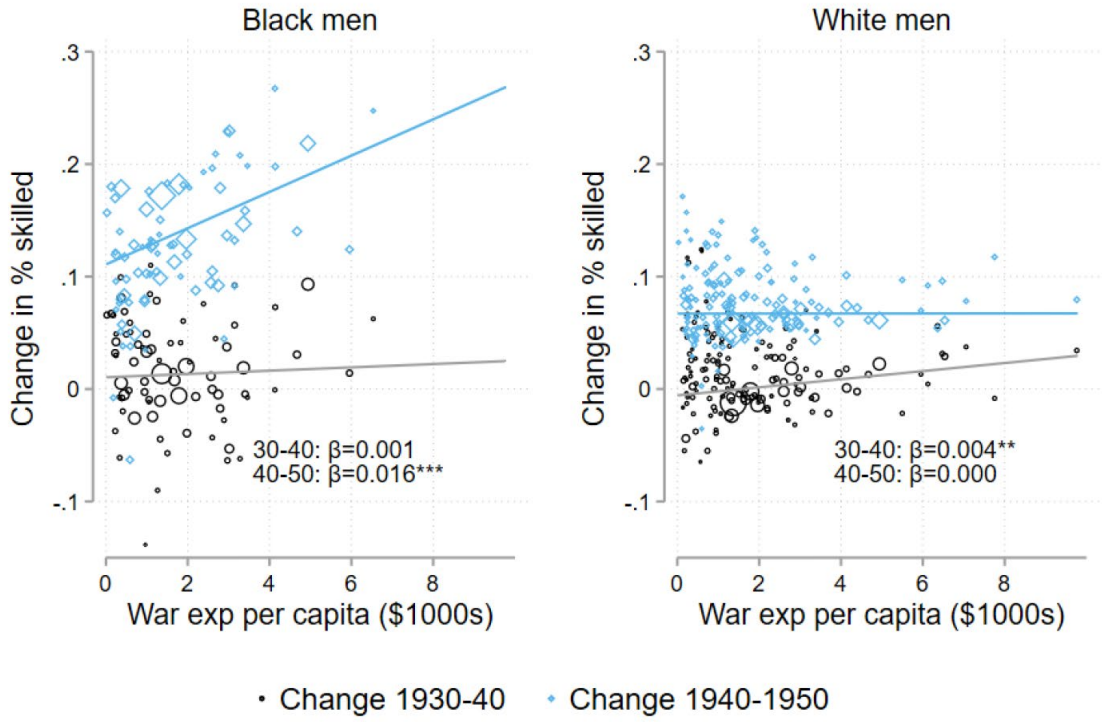
Figure V: Entry and exit of black civil servants by earnings decile



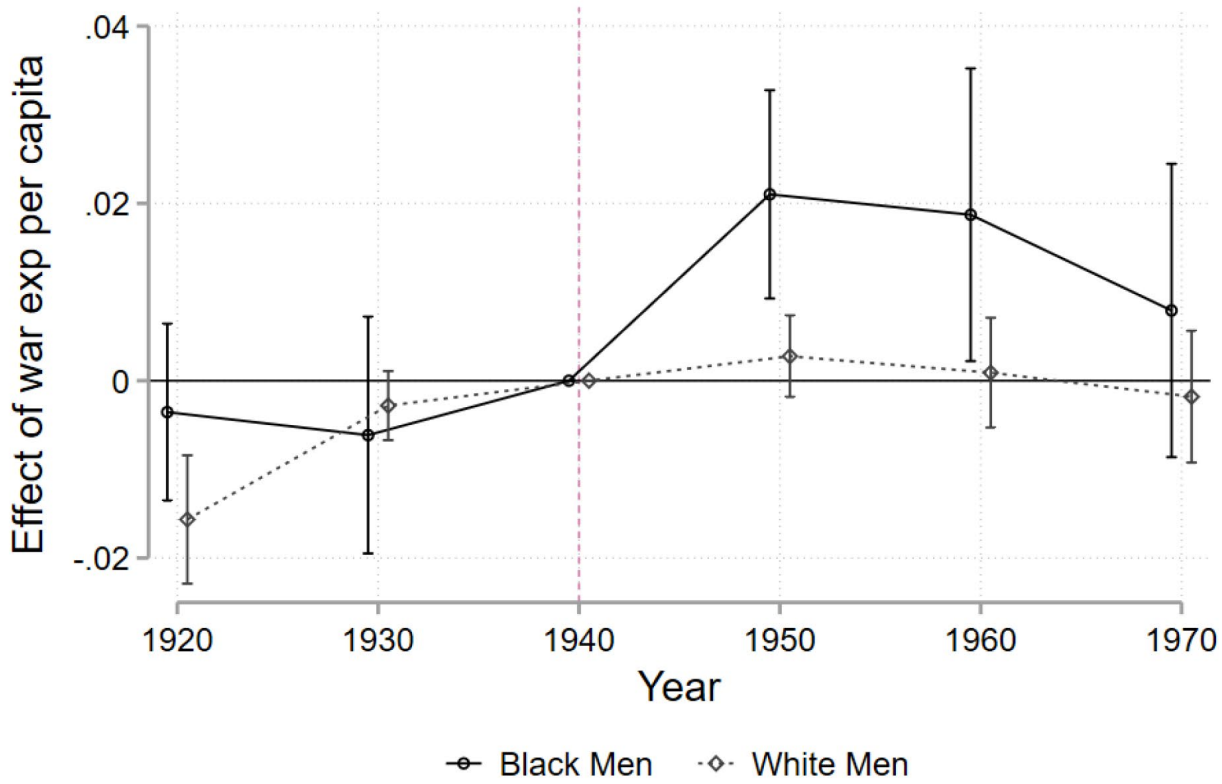
Source: Aneja and Xu, QJE forthcoming

World War II: Defense spending benefited black workers more than white workers

Panel A: Share in skilled occupations



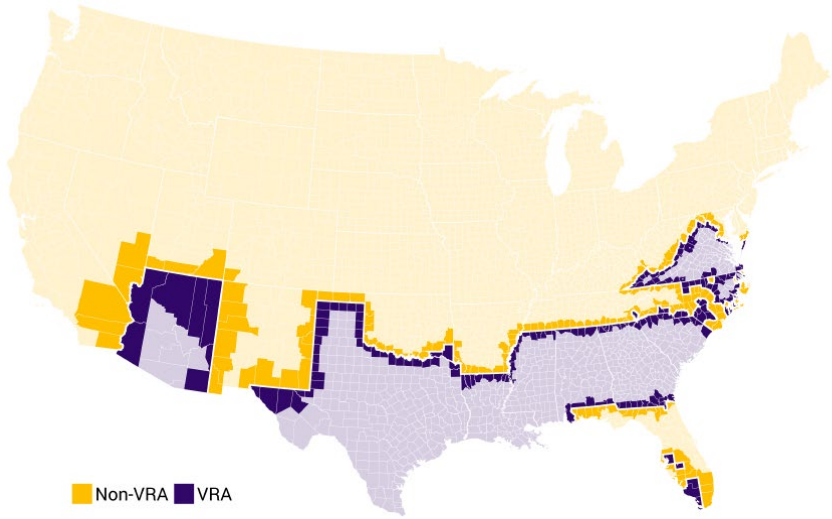
Panel A: Share in skilled occupations

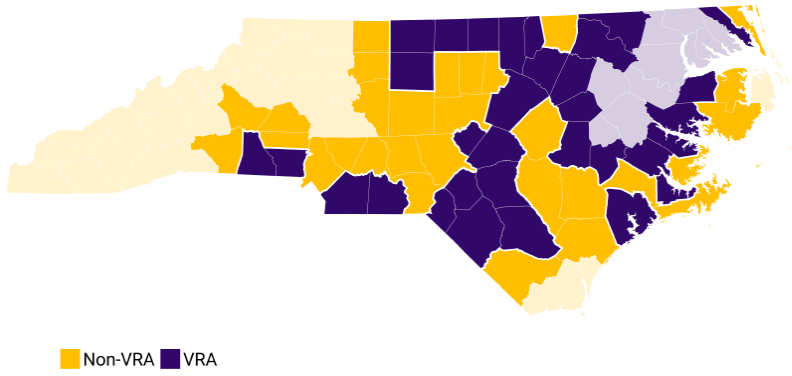


Source: Aizer, et al. NBER WP 2021

Civil Rights legislation: Voting Rights Act 1965

- VRA outlawed practices that denied the right to vote by race nationwide
- Required covered counties to "pre-clear" changes in local election practices – any place with voting test and <50% turnout
- Covered areas mostly in the Old South but some within state variation as well (see North Carolina)

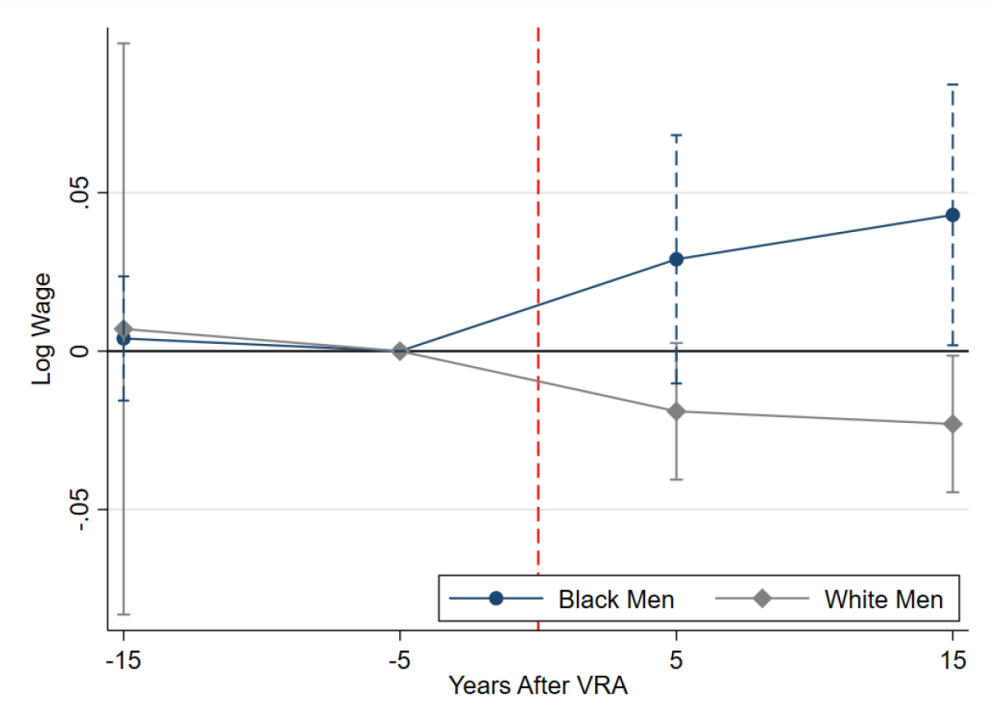




Source: Aneja and Avenancio-Leon, WP 2021

Gaining the franchise improved black economic outcomes

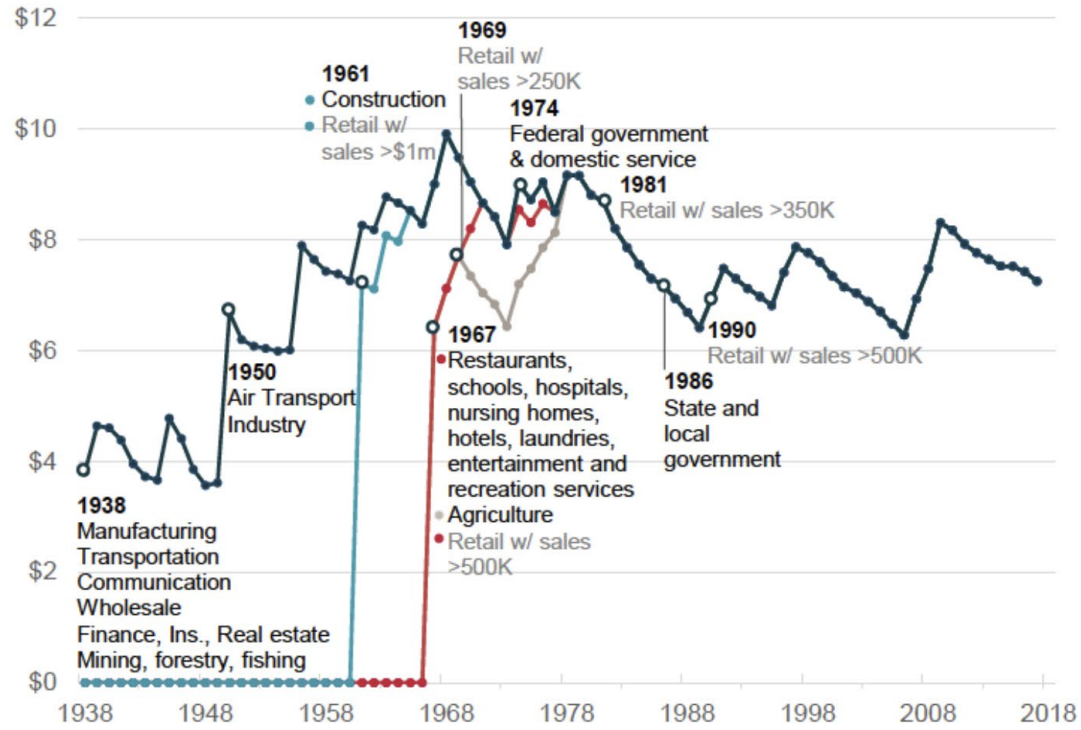
Figure VI: Impact of the VRA on Wages
(by Race)



- VRA associated with higher turnout and more black officials
- Leads to higher wages for black workers. Stronger effects in counties with higher %black. Note = uses restricted access data from Census to get county identifiers
- Also increases probability of public sector employment (which offered wage premium of 20% for black workers)

Expanding coverage of minimum wage in 1960s during Civil Rights era

Figure 2: Expansions in minimum wage coverage, and real values of the minimum wage 1938-2018 ($2017)



- 1938 Fair Labor Standards Act (part of New Deal) covered 43% of workforce – any industries deemed to engage in "interstate commerce"
- Biggest expansion: 1961-75 (63% to 90%) – especially in 1967
- Expanded to many industries that employed black workers (33% black workers, 18% white workers)

Source: Derenoncourt and Montialoux, QJE 2021

Black-white wage convergence strongest in newly covered industries in this period (esp. in South)

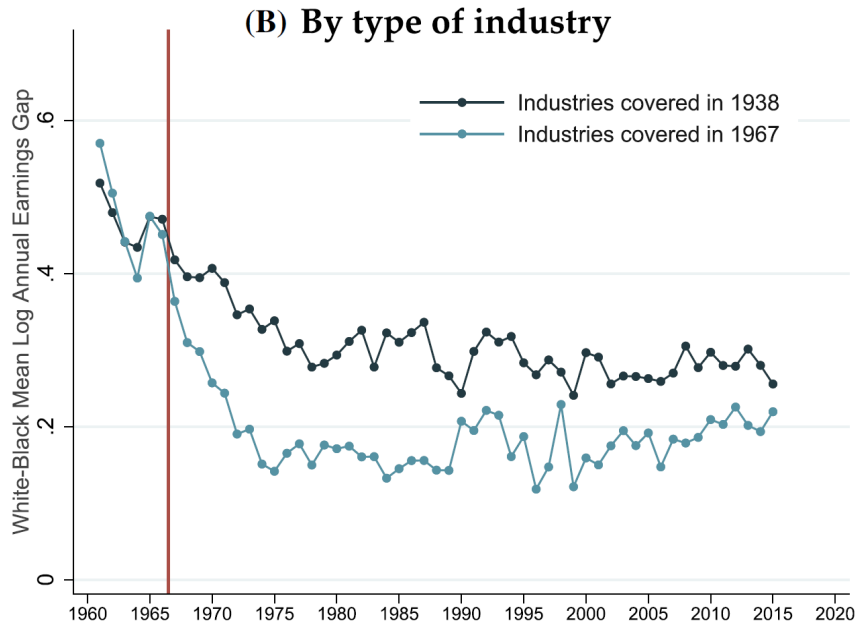


FIGURE II

White-Black Unadjusted Wage Gap in the Long Run

Annual Social and Economic Supplement of the Current Population Survey, 1962–2016. Sample: Adults 25–65, black or white, who worked more than 13 weeks last year and three hours last week, not self-employed, not in group quarters, not unpaid family worker, no missing industry or occupation code. The economy-wide racial gap is defined here as the combination between the industries covered in 1938 and the industries covered in 1967. Color version of figures available online.

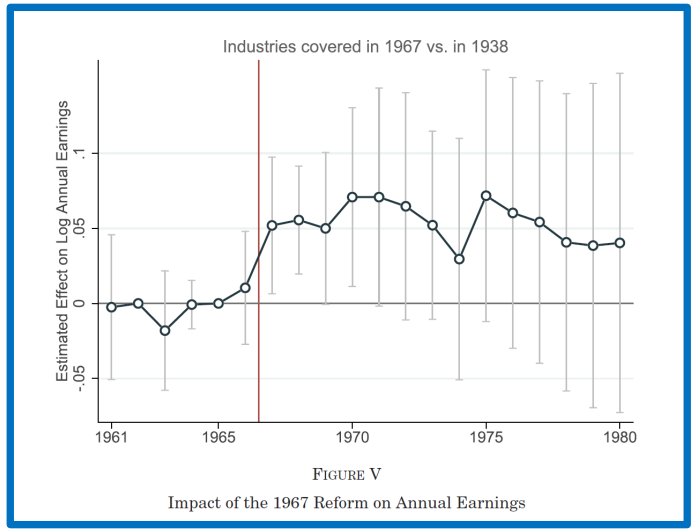
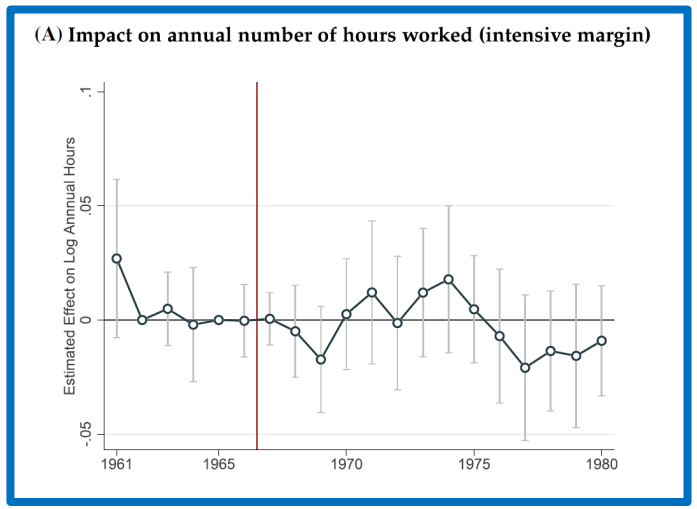


FIGURE V

Impact of the 1967 Reform on Annual Earnings



Expansion of Equal Employment Opportunity Act, 1972

- EEOC established in 1965, investigate claims of discrimination under Title VII of Civil Rights Act
- Federal protection initially limited to firms with 25+ employees, but many states outside the South had state protection for smaller firms
- Use CPS and compare industries by %employees in small firms inside and outside South
- Note – no micro data here on employer size

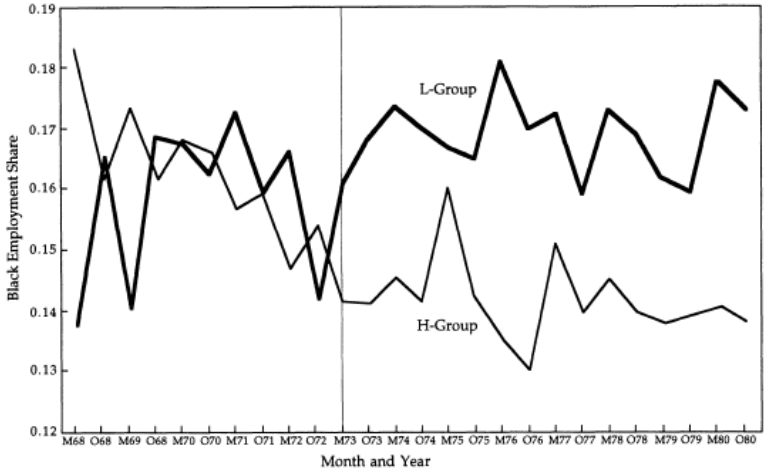


Figure 1a. Blacks' Share of Employment for Current Job: South.

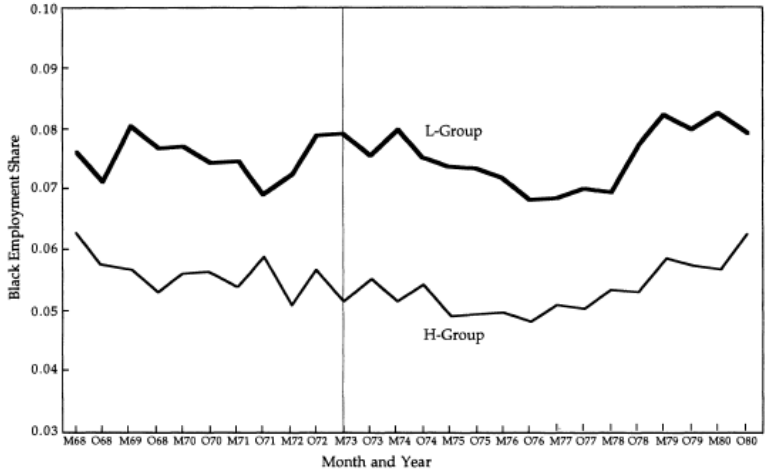
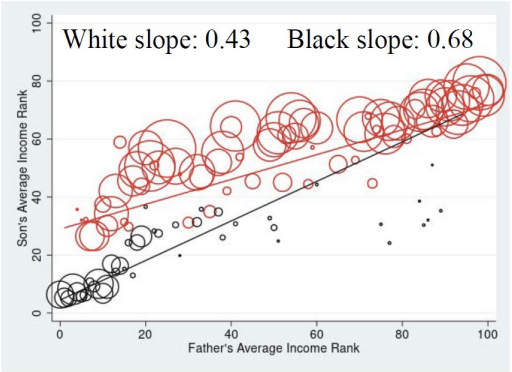


Figure 1b. Blacks' Share of Employment for Current Job: Non-South.

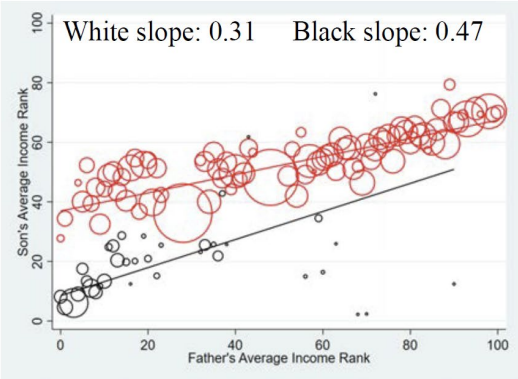
Source: Chay, *ILRR* 1998

Intergenerational mobility from 1880-today

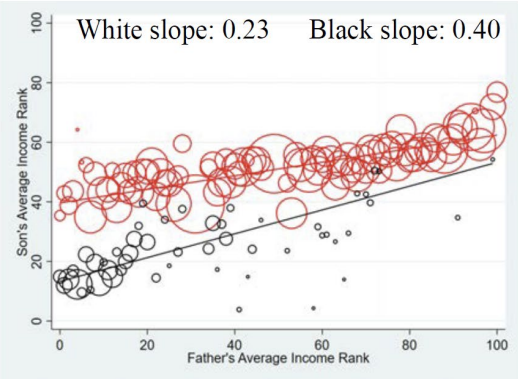
PANEL A: 1900 COHORT



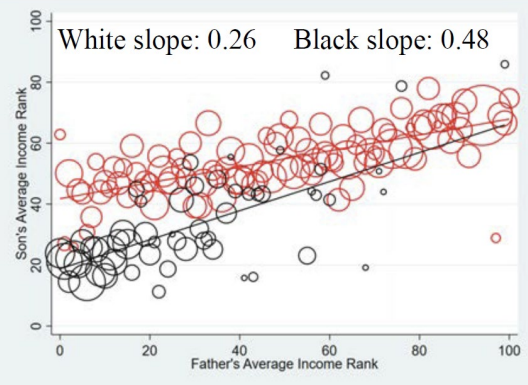
PANEL C: 1962 COHORT



PANEL D: 1973 COHORT



PANEL E: 1990 COHORT



1. White mobility more rapid than black mobility over the whole century, particularly at the bottom

2. No change in upward mobility before/after Civil Rights

3. Lower mobility accounts for more of the black-white wage gap than does initial family differences

Source: Collins & Wanamaker NBER WP 2021
Data: 1880-1900 Census link
1962 and 1973 Occ Change in Generation
NLSY: 1970 to 1990

Low rates of upward mobility can "account" for slow black-white wage convergence

- Margo (2016) suggests thinking of black-white wage gap at 25 year intervals as generations
- Usual intergenerational elasticity (IGE) estimates between father and son income (around 0.5) would imply more convergence than observed – e.g., from 1870 to 1900, actual gains of ratio from 0.27 to 0.32, but IGE implies 0.53!
- Parents pass along two inputs to income: racial identity and human capital. One way of microfounding the idea of a "group" effect. Combined own-parent + group IGE closer to 0.85
- Parents pass racial identity because intermarriage rates are low, residential segregation creates difference in language, accent, names, etc.

$$\ln y_t = \beta_r r_t + \beta_h h_t + \varepsilon_{yt}$$

$$r_t = \lambda_r r_{t-1} + \varepsilon_{rt}$$

$$h_t = \gamma r_t + \lambda_h h_{t-1} + \varepsilon_{ht}.$$

Rising rates of incarceration, especially for black men

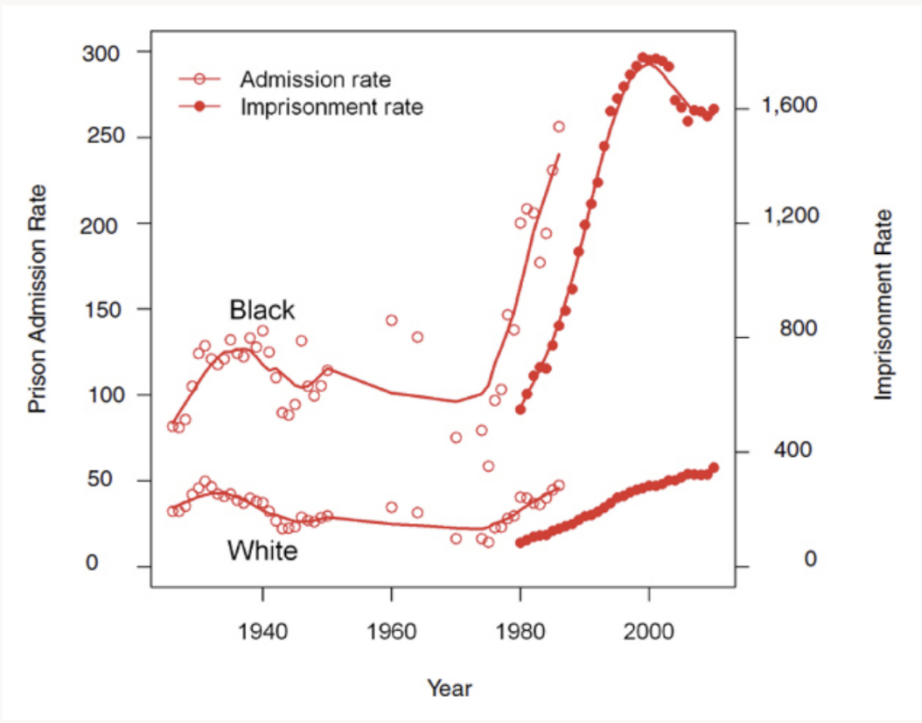
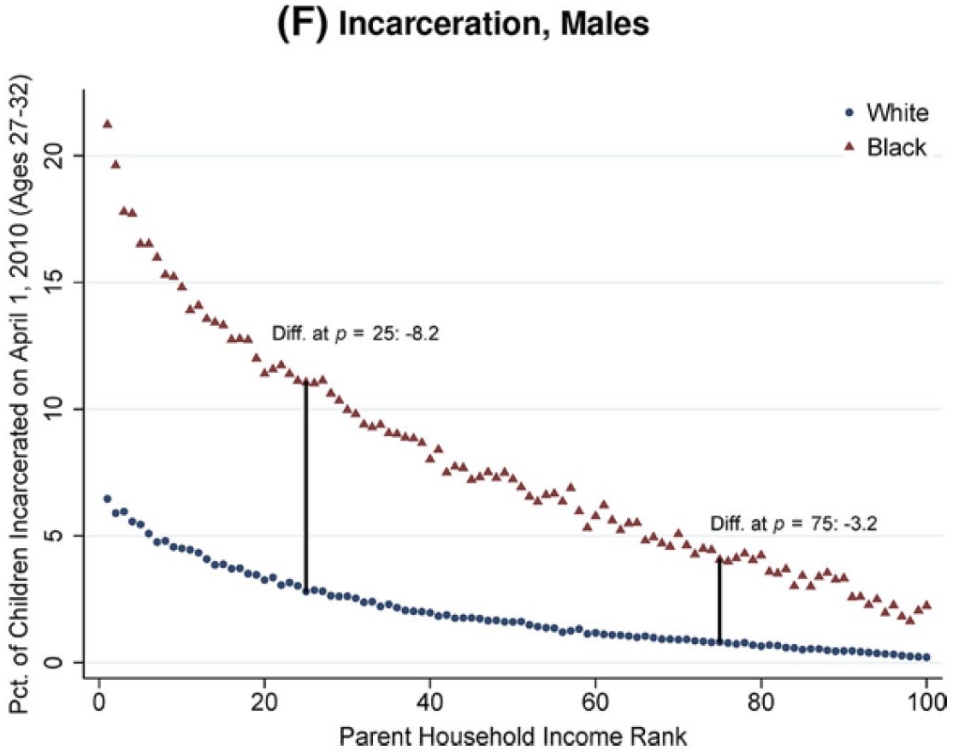


FIGURE 2-11 State and federal prison admission rates, 1926 to 1986, and state and federal imprisonment rates, 1980 to 2010, for blacks and whites.
NOTES: A smooth line indicates the trend. Hispanics are included among both racial groups.
SOURCES: Admissions rates are from Langan (1991b). Black and white imprisonment rates are from Beck and Blumstein (2012).

Incarceration by race, 1920-today. Source: NAS 2014



Incarceration by race and childhood income, 2010
Source: Chetty, et al. *QJE* 2020

Context: In early 20th century, incarceration rates by race narrowed due to *rising* black education

	1940	
Outcome:	= 100 if in Prison	Years of Education
	(4)	(5)
Black*exposure*rural	−1.429*	1.277***
	(0.772)	(0.348)
Exposure*rural	0.078	−0.095
	(0.158)	(0.110)
Black*exposure	1.871*	−0.305
	(0.757)	(0.363)
Black*rural	−1.167***	−0.324***
	(0.148)	(0.118)
Rural	0.081*	−0.675***
	(0.045)	(0.039)
Exposure	0.032	0.659***
	(0.166)	(0.110)
Black	2.781***	−2.074***
	(0.146)	(0.119)
Exposure measure	"Likely seats"	"Likely seats"
Fixed effects	County	County
Mean exposure	0.131	0.131
Sample mean, black	2.552	6.120
R^2	0.255	0.008
N	1,730,760	1,775,391

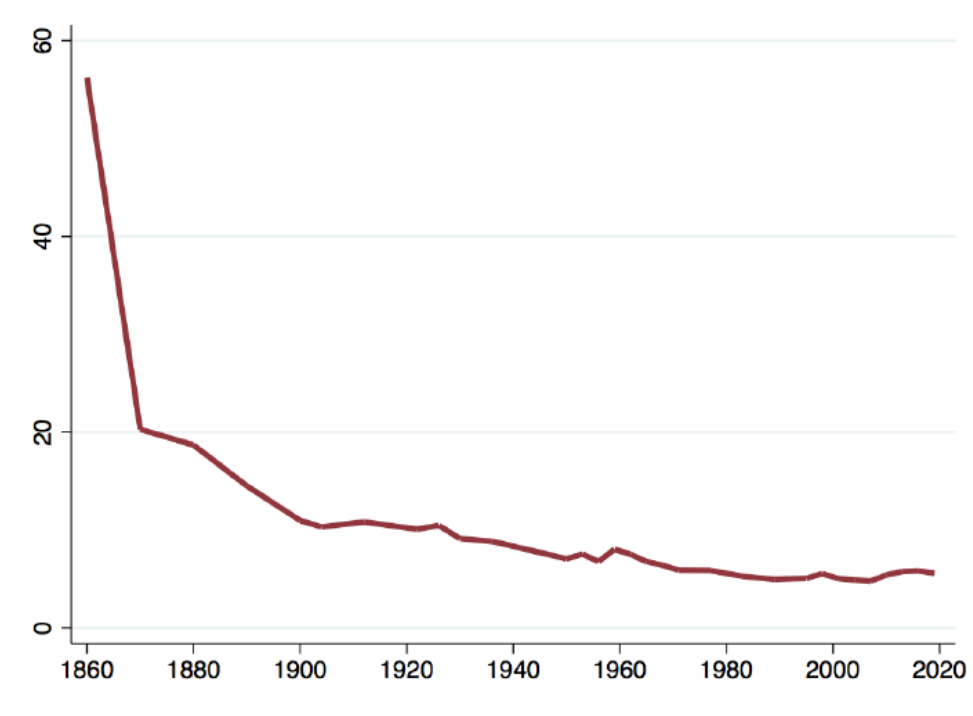
- Was a "Rosenwald school" built in childhood county during years that a cohort would have been in school?
- Compare rural black vs. white children with and without exposure (third contrast = urban residents in county)
- Note: Collected expanded info on incarceration: group quarters, listed as prisoner or inmate, blank "relationship to head" and check image

Source: Eriksson, JHR 2020

Racial wealth gap

- White-black wealth gap is 6-1 now, even if white-black income gap is 1.4
- Racial wealth (and income…) gap has been stagnant since 1980s
- Going further back, filling in series from Census (1860, 70), six states with data collected for wealth tax (1880s-1910s), Survey of Consumer Finances from 1950s on
- Major convergence after Civil War, continued convergence until 1980, then stagnation

Figure 1: White-Black wealth ratio: 1860-2020



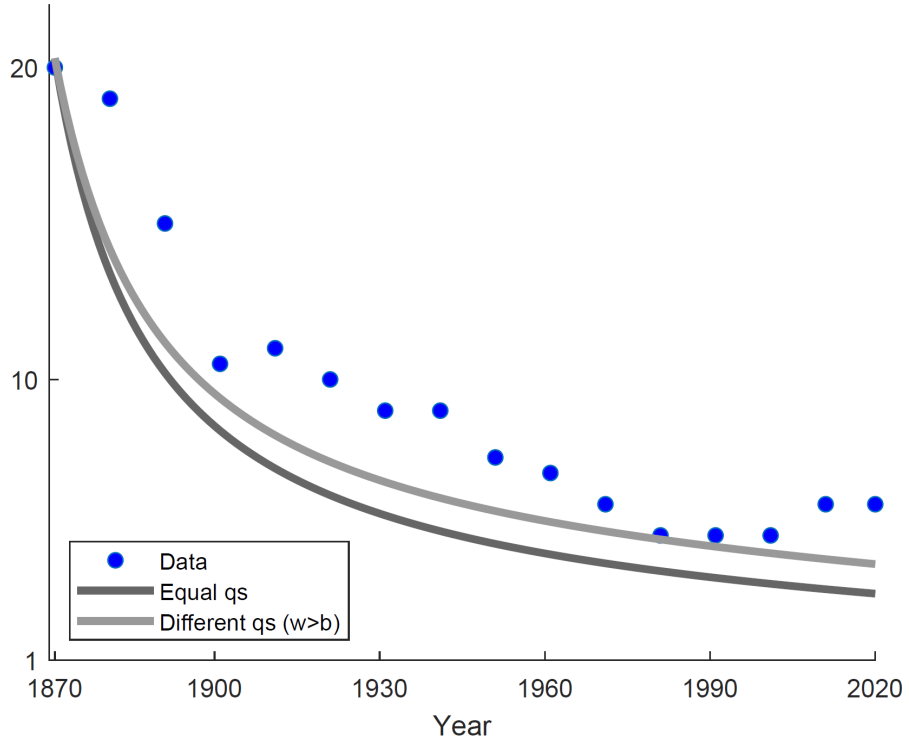
Source: Derenoncourt, et al., WP 2021

What does the series teach us about policies to equalize racial wealth gap?

- Simple accounting: Gap due to differences in savings rates or returns to investments, or to initial differences in wealth and income?

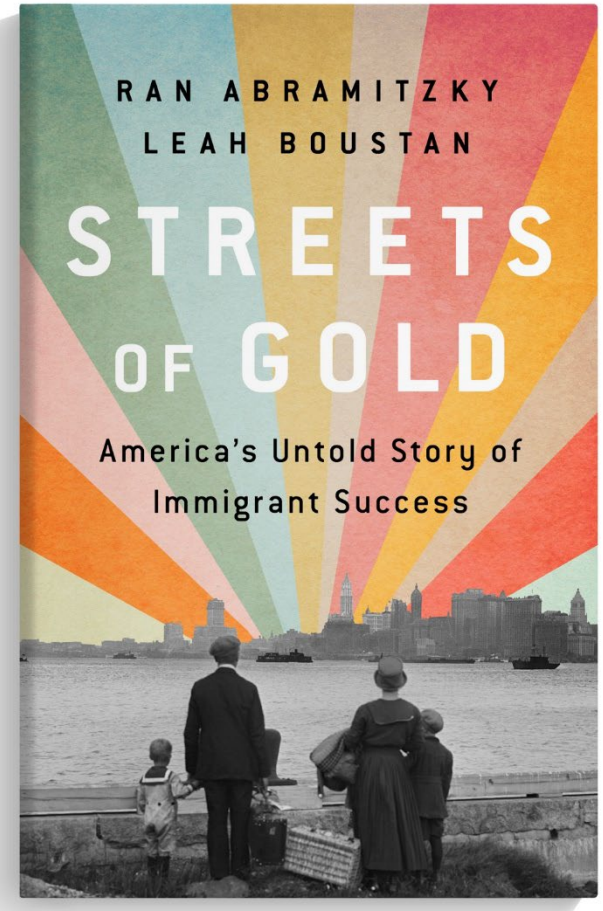
- Start by assuming same savings and returns – the "hockey stick" shape and persistence of gap emerges from initial conditions → policies equalizing access to capital markets not enough

- Rate of convergence faster than in data than in equal savings/returns benchmark. So there is *some* role for equalizing access to stock market



	2020 (data)	2020	2050	2230
Wealth ratio (W/B)	5.7	3.1	2.7	1.4
Income ratio (W/B)	2.1	2.1	1.9	1

Lecture 4: immigration



Reassessing commonly-held myths

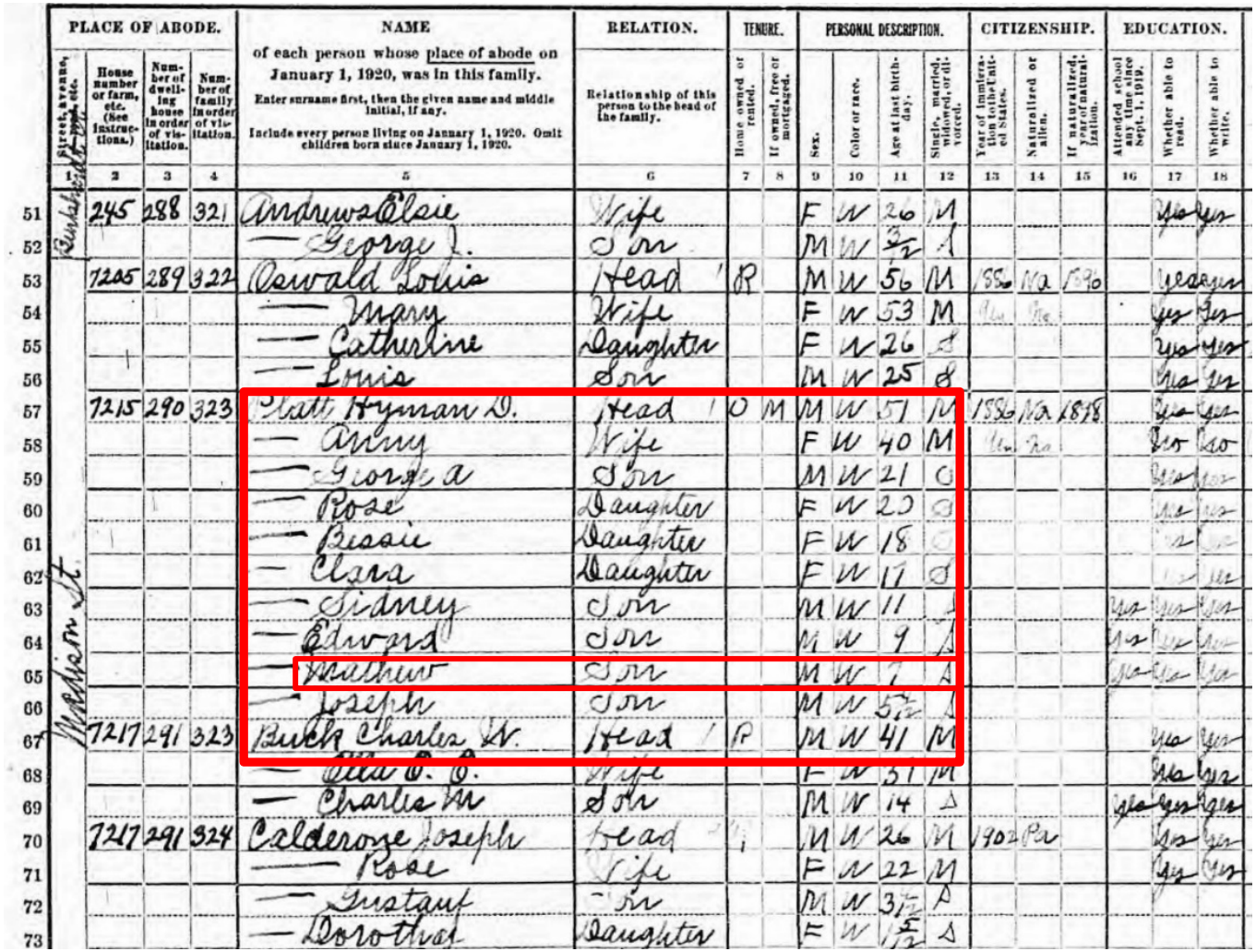
- **Is it really true that today's immigrants:**

1. are less upwardly mobile than past immigrants? No
2. integrate more slowly into society than past immigrants? No

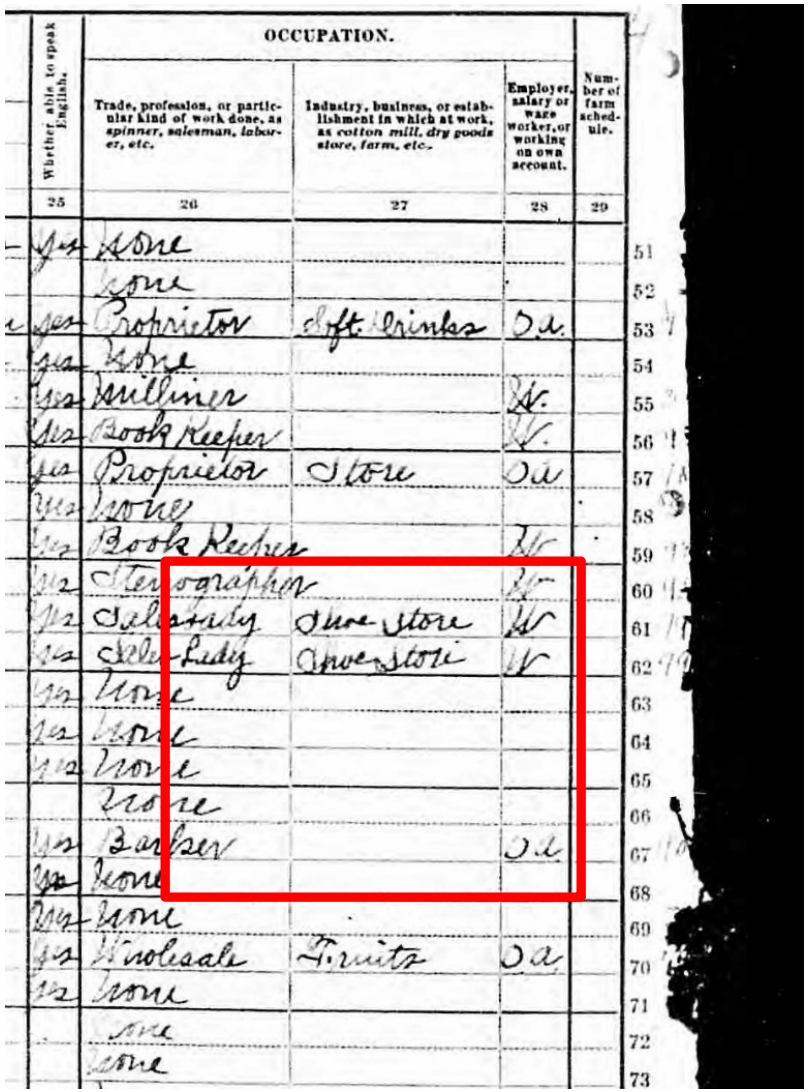
- **American Dream just as real now as it was 100 years ago**
- **Remarkable given huge changes in policy over time**
  - Shifts in: sending regions; undocumented immigration; within-country selection

- **And do immigrants really hurt US-born workers?**

Imagine searching for your own grandfather – multiplied by millions



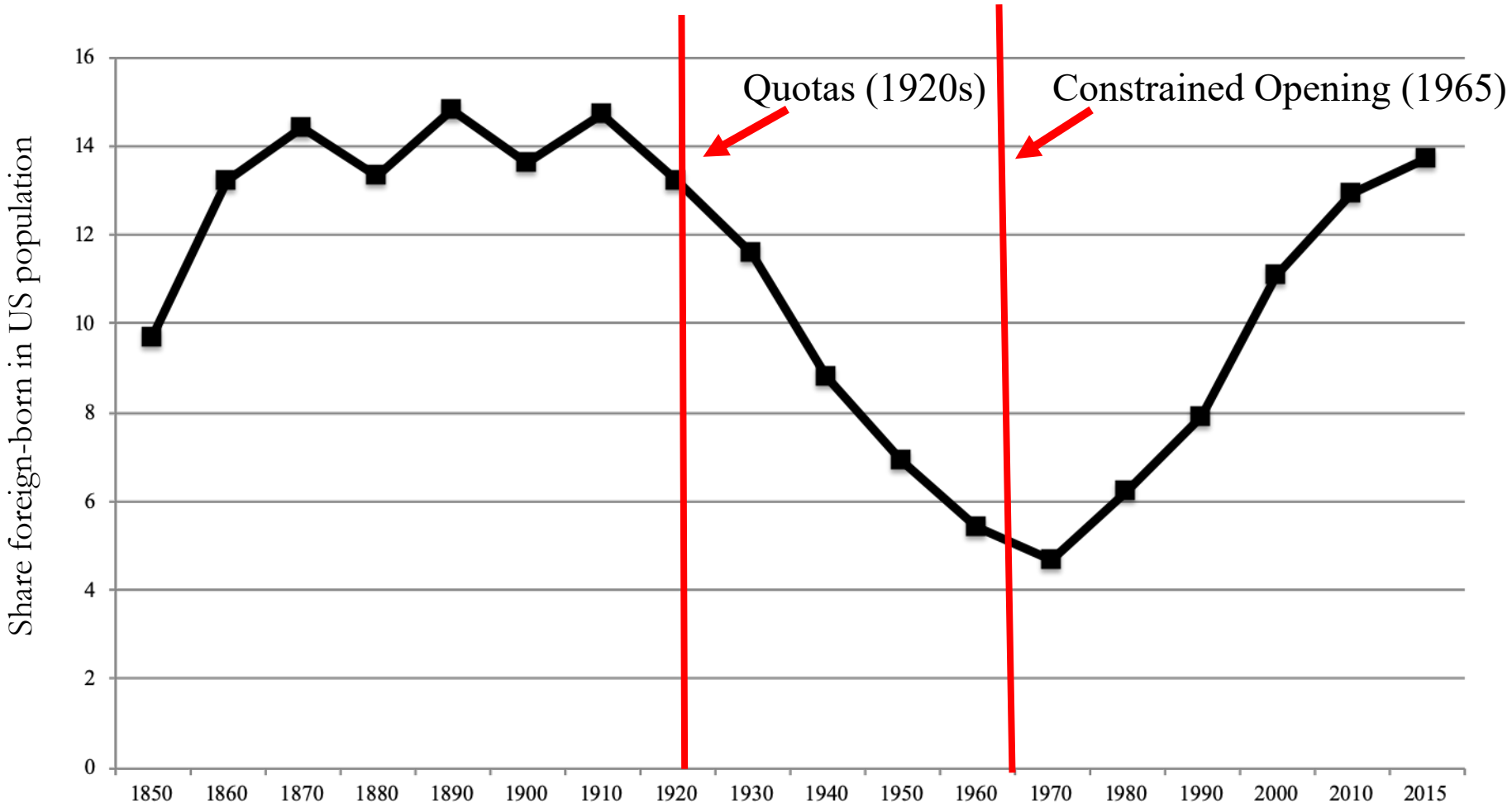
	PLACE OF ABODE.			NAME	RELATION.	TENURE.		PERSONAL DESCRIPTION.				CITIZENSHIP.			EDUCATION.		
	Street, avenue, road, etc.	House number or farm, etc. (See instructions.)	Number of dwelling house in order of visitation.	Number of family in order of visitation.	of each person whose place of abode on January 1, 1920, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on January 1, 1920. Omit children born since January 1, 1920.	Relationship of this person to the head of the family.	Home owned or rented.	If owned, free or mortgaged.	Sex.	Color or race.	Age at last birthday.	Single, married, widowed, or divorced.	Year of immigration to the United States.	Naturalized or alien.	If naturalized, year of naturalization.	Attended school any time since Sept. 1, 1919.	Whether able to read.	Whether able to write.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
51	Burkhart Dr.	245	288	321	Andrews Elsie	Wife			F	W	26	M					Yes	Yes
52					— George L.	Son			M	W	3/12	S						
53		7205	289	322	Oswald Louis	Head	R		M	W	56	M	1886	Na	1890		Yes	Yes
54					— Mary	Wife			F	W	53	M	Na	Na			Yes	Yes
55					— Catherine	Daughter			F	W	26	S					Yes	Yes
56					— Louis	Son			M	W	25	S					Yes	Yes
57		7215	290	323	Platt Hyman D.	Head	O	M	M	W	57	M	1886	Na	1898		Yes	Yes
58					— Anny	Wife			F	W	40	M	Ir	Ir			Yes	Yes
59					— George A	Son			M	W	21	S					Yes	Yes
60					— Rose	Daughter			F	W	20	S					Yes	Yes
61					— Bessie	Daughter			F	W	18	S					Yes	Yes
62					— Clara	Daughter			F	W	17	S					Yes	Yes
63					— Sidney	Son			M	W	11	S				Yes	Yes	Yes
64					— Edward	Son			M	W	9	S				Yes	Yes	Yes
65					— Mathew	Son			M	W	7	S				Yes	Yes	Yes
66					— Joseph	Son			M	W	5/12	S						
67	Madison St.	7217	291	323	Buck Charles W.	Head	R		M	W	41	M					Yes	Yes
68					— Ella O.	Wife			F	W	31	M					Yes	Yes
69					— Charles W.	Son			M	W	14	S				Yes	Yes	Yes
70		7217	291	324	Calderone Joseph	Head	M		M	W	26	M	1902	Pa			Yes	Yes
71					— Rose	Wife			F	W	22	M					Yes	Yes
72					— Gustauf	Son			M	W	3/12	S						
73					— Dorothea	Daughter			F	W	5/12	S						



	Whether able to speak English.	OCCUPATION. Trade, profession, or particular kind of work done, as spinner, salesman, laborer, etc.	Industry, business, or establishment in which at work, as cotton mill, dry goods store, farm, etc.	Employer, salary or wage worker, or working on own account.	Number of farm schedule.	
	25	26	27	28	29	
	yes	None				51
		None				52
	yes	Proprietor	Soft Drinks	O.		53
	yes	None				54
	yes	Milliner		W.		55
	yes	Book Keeper		W.		56
	yes	Proprietor	Store	O.		57
	yes	None				58
	yes	Book Keeper		W.		59
	yes	Stenographer		W.		60
	yes	Saleslady	Shoe Store	W.		61
	yes	Sales Lady	Shoe Store	W.		62
	yes	None				63
	yes	None				64
	yes	None				65
		None				66
	yes	Barber		O.		67
	yes	None				68
	yes	None				69
	yes	Wholesale	Fruits	O.		70
	yes	None				71
		None				72
		None				73

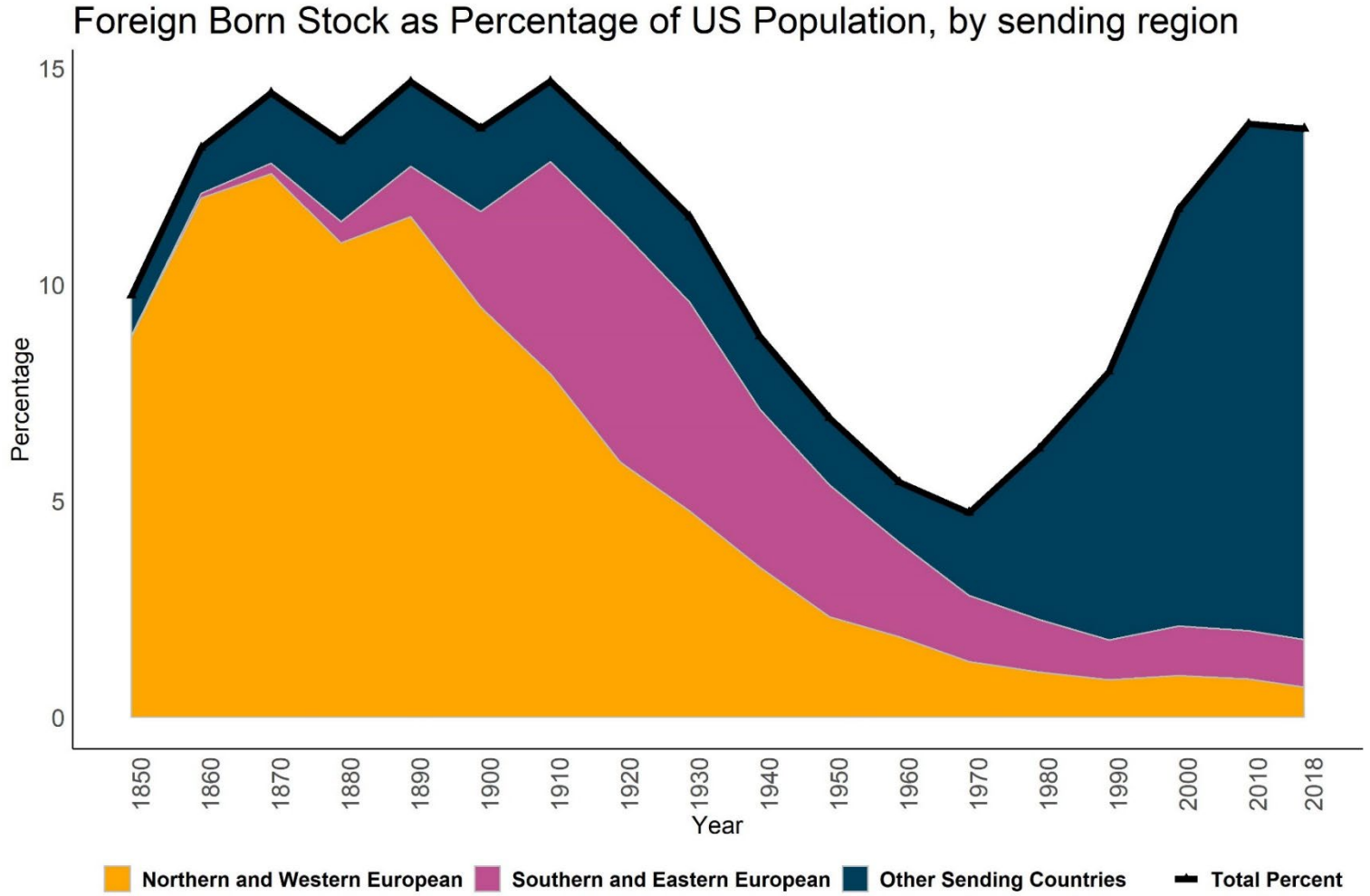
On linking methods: Abramitzky, Boustan, Eriksson, Feigenbaum and Perez, forthcoming in *JEL* for details. Download linked files at censuslinkingproject.org

The "Immigration U" in US history



Source: Abramitzky and Boustan, *JEL* (2017)

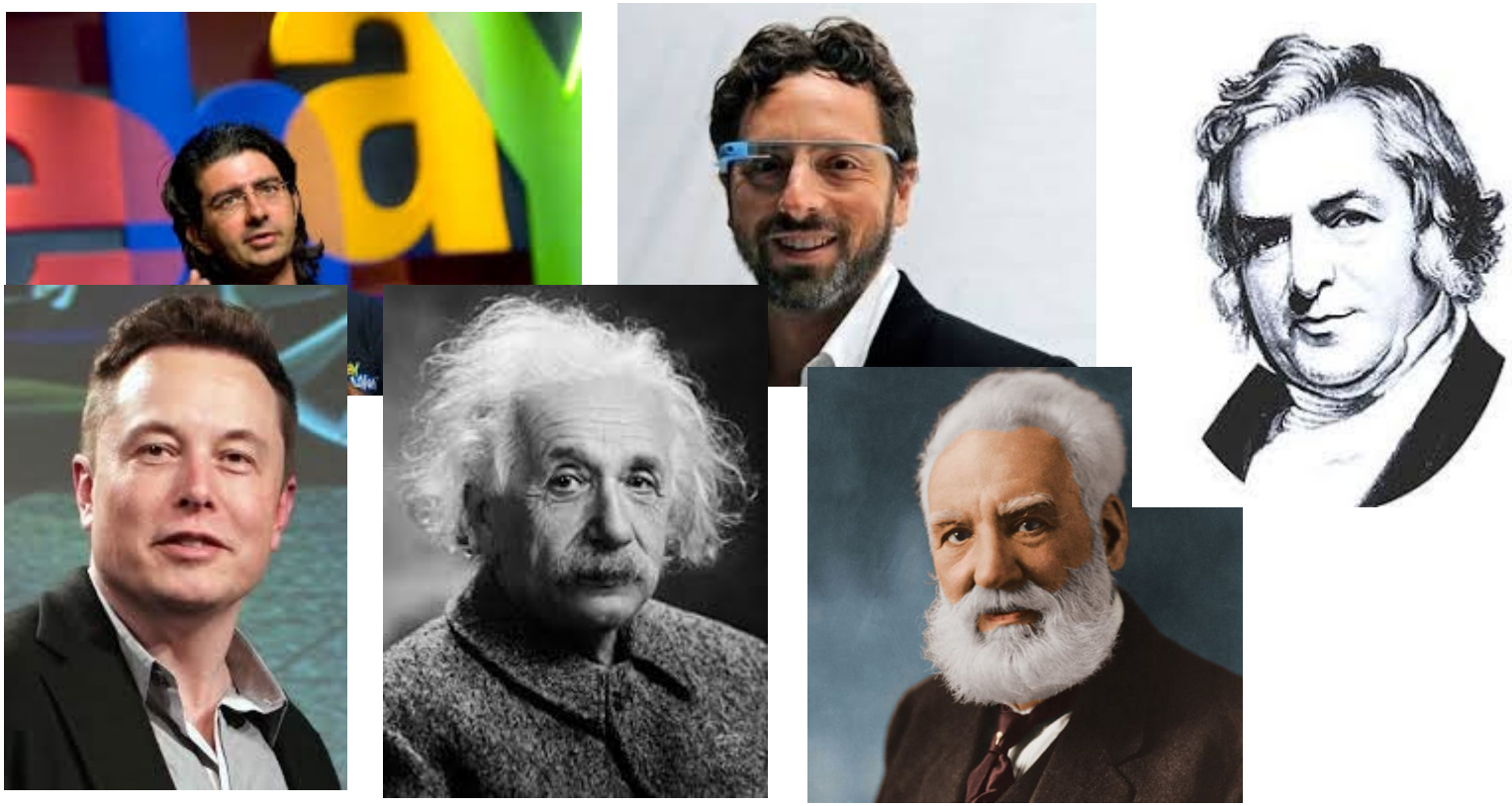
Who immigrates to the US? Sending regions



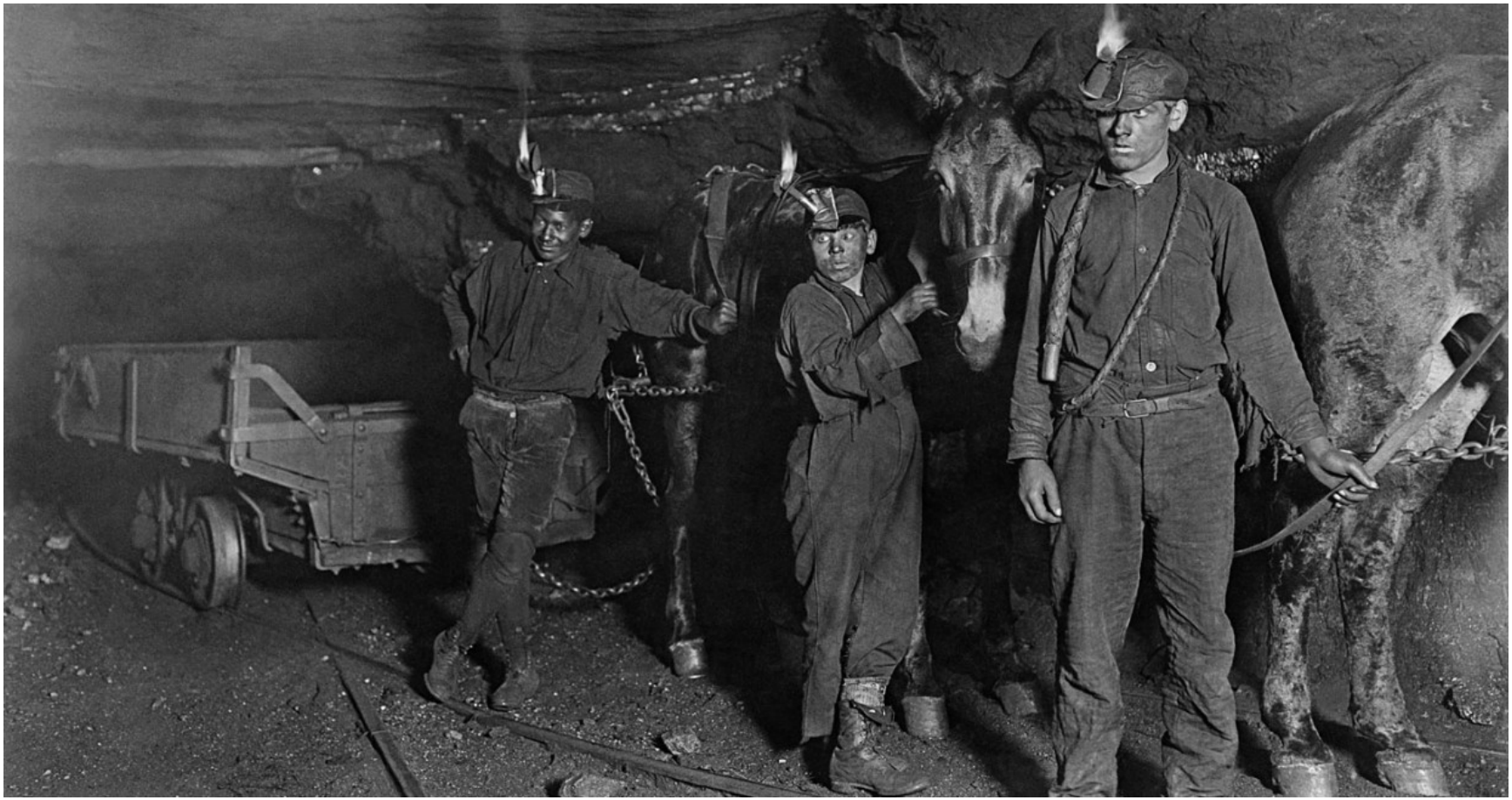
Source: Abramitzky and Boustan, *JEL* (2017)

Is it really true that immigrants used to arrive penniless and quickly caught up with US born?

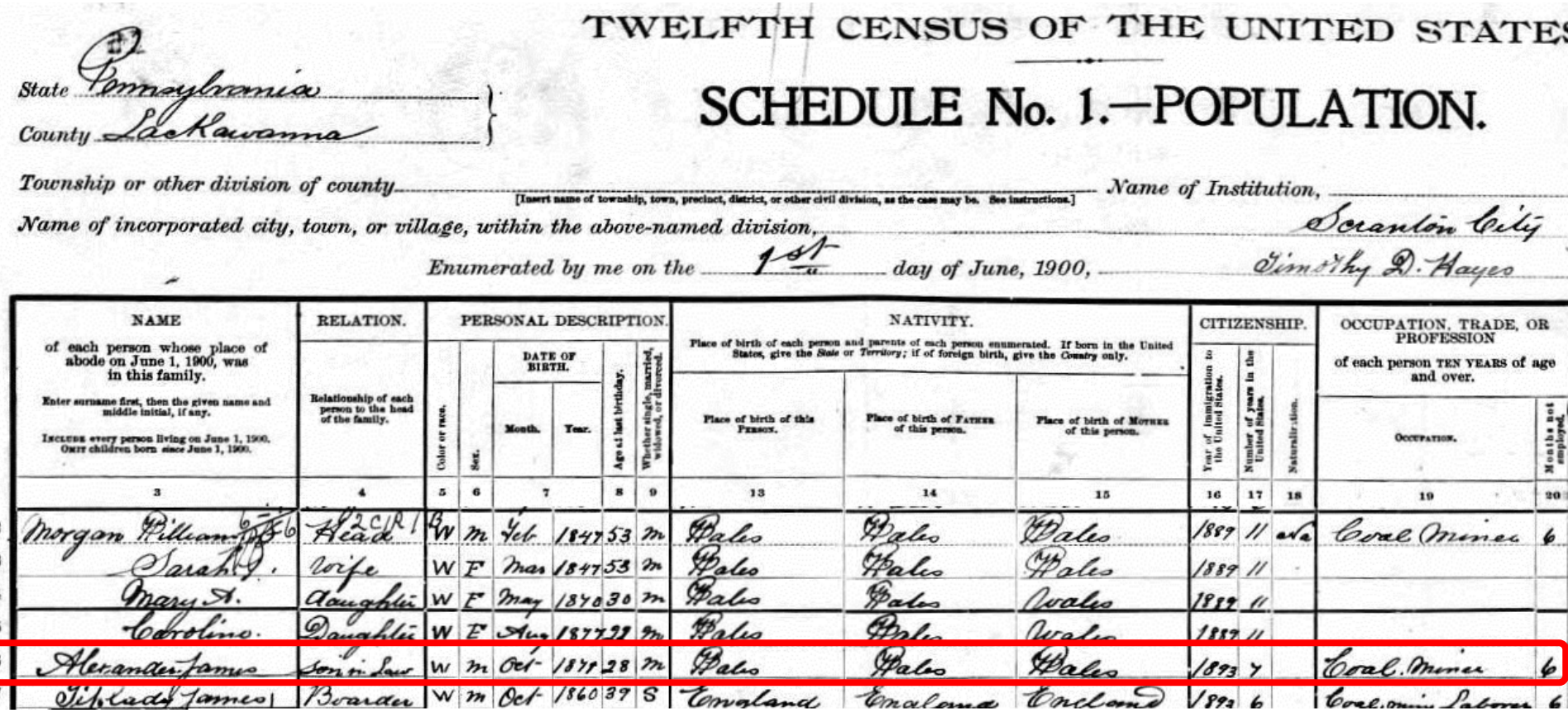
We all know many success stories



But what about a *typical* immigrant?



James Alexander in 1900: Coal miner



TWELFTH CENSUS OF THE UNITED STATES

State Pennsylvania
County Lackawanna

SCHEDULE No. 1.—POPULATION.

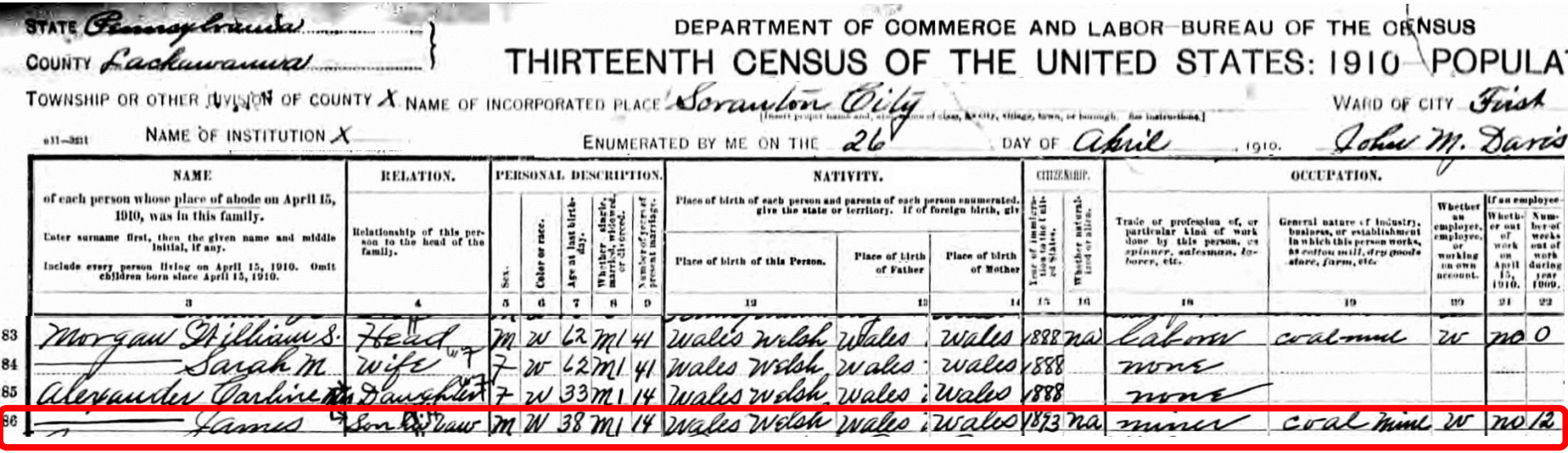
Township or other division of county ____ [Insert name of township, town, precinct, district, or other civil division, as the case may be. See instructions.] Name of Institution, ____

Name of incorporated city, town, or village, within the above-named division, Scranton City

Enumerated by me on the 1st day of June, 1900, Timothy D. Hayes

	NAME of each person whose place of abode on June 1, 1900, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on June 1, 1900. Omit children born since June 1, 1900.	RELATION. Relationship of each person to the head of the family.	PERSONAL DESCRIPTION. Color or race.	Sex.	DATE OF BIRTH. Month.	Year.	Age at last birthday.	Whether single, married, widowed, or divorced.	NATIVITY. Place of birth of each person and parents of each person enumerated. If born in the United States, give the State or Territory; if of foreign birth, give the Country only. Place of birth of this Person.	Place of birth of Father of this person.	Place of birth of Mother of this person.	CITIZENSHIP. Year of immigration to the United States.	Number of years in the United States.	Naturalization.	OCCUPATION, TRADE, OR PROFESSION of each person TEN YEARS of age and over. Occupation.	Months not employed.
	3	4	5	6	7		8	9	13	14	15	16	17	18	19	20
72	Morgan William	Head	W	m	Feb	1847	53	m	Wales	Wales	Wales	1869	11	n/a	Coal Miner	6
73	Sarah J.	wife	W	F	Mar	1847	53	m	Wales	Wales	Wales	1869	11			
74	Mary A.	daughter	W	F	May	1870	30	m	Wales	Wales	Wales	1869	11			
75	Caroline	Daughter	W	F	Aug	1877	22	m	Wales	Wales	Wales	1887	11			
76	Alexander James	Son in Law	W	m	Oct	1871	28	m	Wales	Wales	Wales	1893	7		Coal Miner	6
77	Gilchrist James	Boarder	W	m	Oct	1860	39	S	England	England	England	1892	6		Coal mine Laborer	6

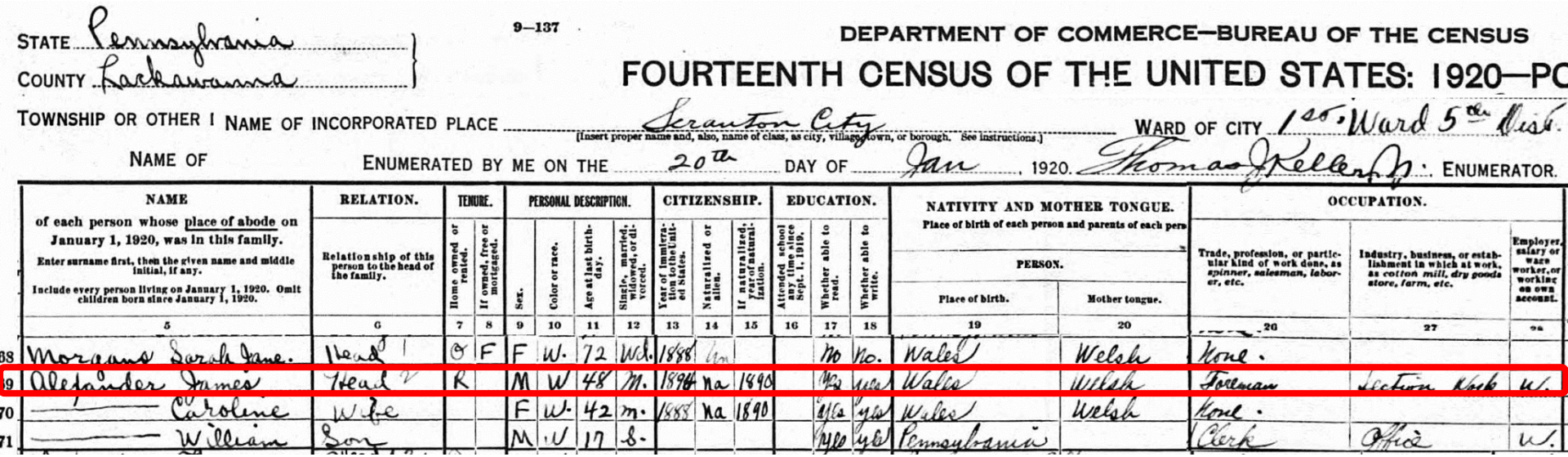
James Alexander in 1910: Coal miner



STATE Pennsylvania
COUNTY Lackawanna
DEPARTMENT OF COMMERCE AND LABOR—BUREAU OF THE CENSUS
THIRTEENTH CENSUS OF THE UNITED STATES: 1910 POPULA
TOWNSHIP OR OTHER DIVISION OF COUNTY X NAME OF INCORPORATED PLACE Scranton City
WARD OF CITY First
e11—3311 NAME OF INSTITUTION X
ENUMERATED BY ME ON THE 26 DAY OF April, 1910. John M. Davis

	NAME of each person whose place of abode on April 15, 1910, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on April 15, 1910. Omit children born since April 15, 1910.	RELATION. Relationship of this person to the head of the family.	PERSONAL DESCRIPTION. Sex.	Color or race.	Age at last birthday.	Whether single, married, widowed, or divorced.	Number of years of present marriage.	NATIVITY. Place of birth of each person and parents of each person enumerated, give the state or territory. If of foreign birth, give Place of birth of this Person.	Place of birth of Father	Place of birth of Mother	CITIZENSHIP. Year of immigration to the United States.	Whether naturalized or alien.	OCCUPATION. Trade or profession of, or particular kind of work done by this person, as spinner, salesman, laborer, etc.	General nature of industry, business, or establishment in which this person works, as cotton mill, dry goods store, farm, etc.	Whether an employer, employee, or working on own account.	If an employee: Whether out of work on April 15, 1910.	If an employee: Number of weeks out of work during year 1909.
	3	4	5	6	7	8	9	12	13	14	15	16	18	19	20	21	22
83	Morgan William S.	Head	M	W	62	M	41	Wales Welsh	Wales	Wales	1888	na	Laborer	coal mine	W	no	0
84	Sarah M.	wife	F	W	62	M	41	Wales Welsh	Wales	Wales	1888		none				
85	Alexander Carline	Daughter	F	W	33	M	14	Wales Welsh	Wales	Wales	1888		none				
86	James	Son-in-law	M	W	38	M	14	Wales Welsh	Wales	Wales	1873	na	miner	coal mine	W	no	12

James Alexander in 1920: Foreman

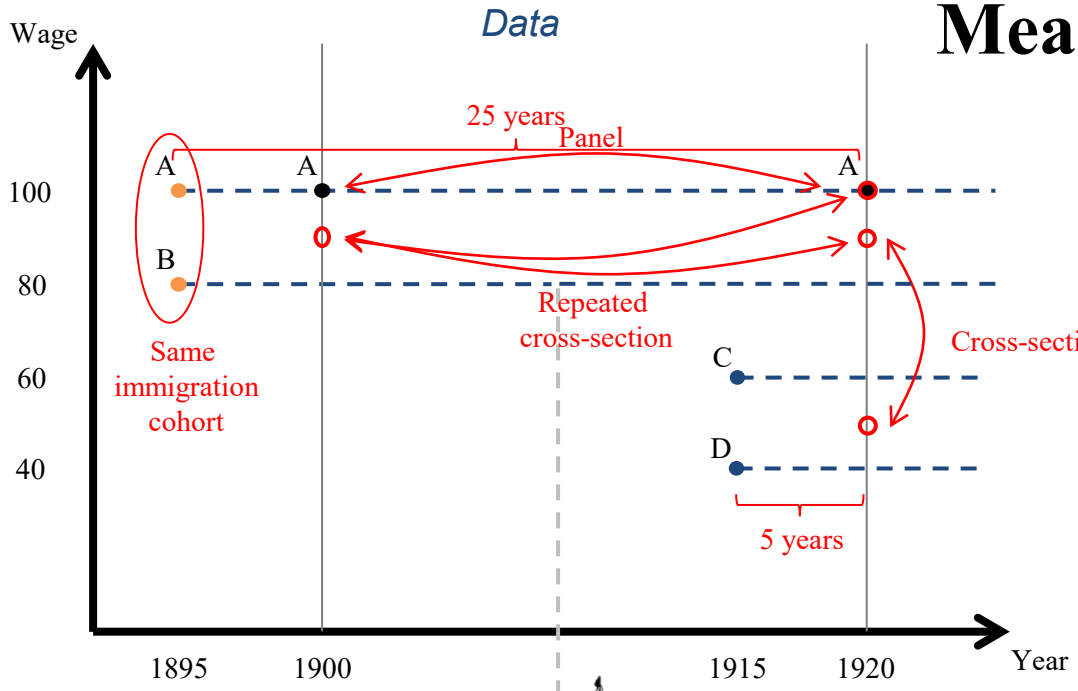


STATE Pennsylvania
COUNTY Lackawanna
9—137
DEPARTMENT OF COMMERCE—BUREAU OF THE CENSUS
FOURTEENTH CENSUS OF THE UNITED STATES: 1920—PO
TOWNSHIP OR OTHER I NAME OF INCORPORATED PLACE Scranton City [Insert proper name and, also, name of class, as city, village, town, or borough. See instructions.] WARD OF CITY 1st Ward 5th Dist.
NAME OF ENUMERATED BY ME ON THE 20th DAY OF Jan, 1920. Thomas J Kelly Jr. ENUMERATOR.

	NAME of each person whose place of abode on January 1, 1920, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on January 1, 1920. Omit children born since January 1, 1920.	RELATION. Relationship of this person to the head of the family.	TENURE. Home owned or rented.	TENURE. If owned, free or mortgaged.	PERSONAL DESCRIPTION. Sex.	PERSONAL DESCRIPTION. Color or race.	PERSONAL DESCRIPTION. Age at last birthday.	PERSONAL DESCRIPTION. Single, married, widowed, or divorced.	CITIZENSHIP. Year of immigration to the United States.	CITIZENSHIP. Naturalized or alien.	CITIZENSHIP. If naturalized, year of naturalization.	EDUCATION. Attended school any time since Sept. 1, 1919.	EDUCATION. Whether able to read.	EDUCATION. Whether able to write.	NATIVITY AND MOTHER TONGUE. Place of birth of each person and parents of each person. PERSON. Place of birth.	NATIVITY AND MOTHER TONGUE. Mother tongue.	OCCUPATION. Trade, profession, or particular kind of work done, as spinner, salesman, laborer, etc.	OCCUPATION. Industry, business, or establishment in which at work, as cotton mill, dry goods store, farm, etc.	OCCUPATION. Employer, salary or wage worker, or working on own account.
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	26	27	28a
68	Morgans Sarah Jane	Head	O	F	F	W.	72	Wd.	1888	Na			No	No.	Wales	Welsh	None.		
69	Alexander James	Head	R		M	W	48	M.	1896	Na	1890		Yes	Yes	Wales	Welsh	Foreman	Section Work	W.
70	——— Caroline	Wife			F	W.	42	M.	1888	Na	1890		Yes	Yes	Wales	Welsh	None.		
71	——— William	Son			M	W	17	S.					Yes	Yes	Pennsylvania		Clerk	Office	W.

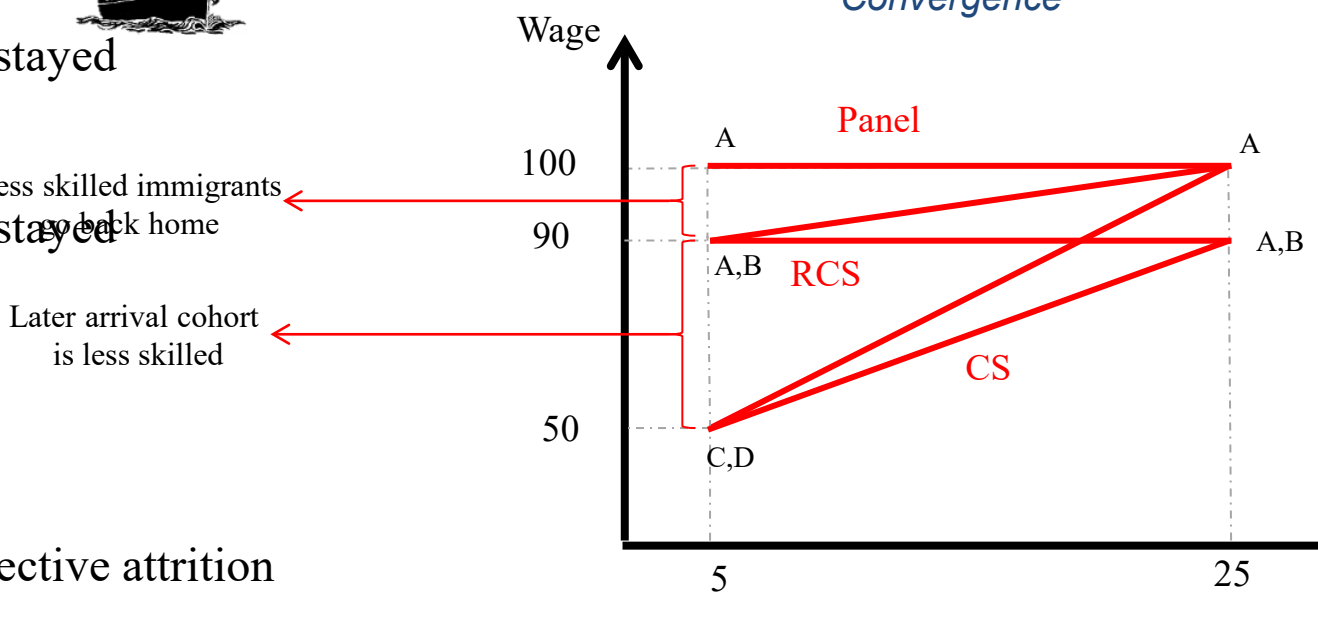
Measuring convergence: the need for panel data

[back]



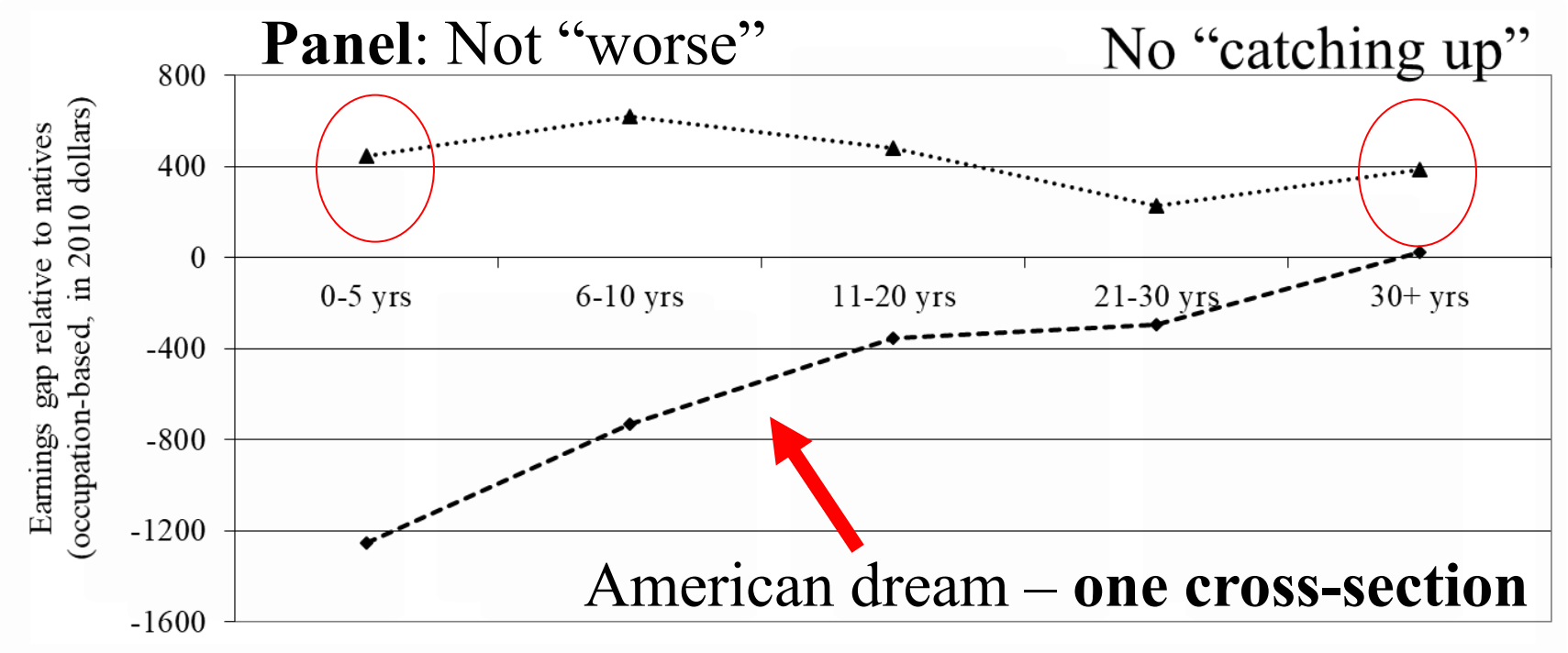
Immigrants A and B arrived in 1895 and stayed

Immigrants C and D arrived in 1915 and stayed



Other sources of selective attrition

American Dream is overstated for first generation



But substantial variation by country

"A Nation of Immigrants: Assimilation and Economic Outcomes in the Age of Mass Migration," Abramitzky, Boustan and Eriksson, *JPE* 2014

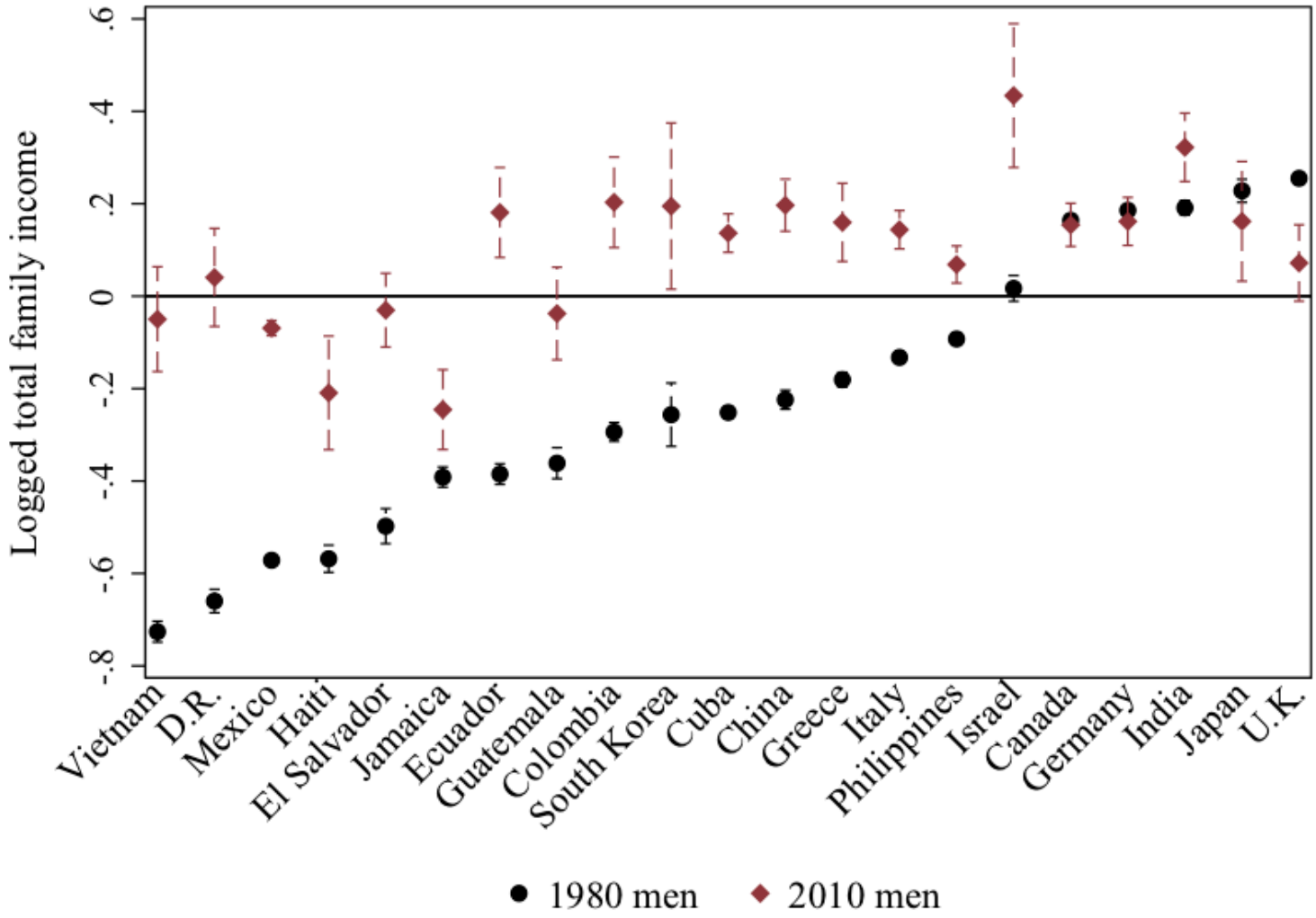
Children of immigrants catch up

- We find that children of immigrants catch up with children of US-born
- True both in the past and present
- True for almost every sending country

Abramitzky, Ran, Leah Boustan, Santiago Perez, and Elisa Jacome, "Intergenerational Mobility of Immigrants in the US over Two Centuries," *AER* (2021)

Start with raw earnings. Immigrants today earn less but children converge

(1) $Y_{iac} = \alpha + \sum_{c=1}^{N} \beta_c \, \text{Country}_c + \delta_a + \epsilon_{iac}.$



1980 = first gen, 2010 = second gen

Linking fathers and sons

- **Historical Analysis**
  - Linked Census records: 1880-1910, 1910-1940
  - Income score based on occupation, age, state [from 1940]

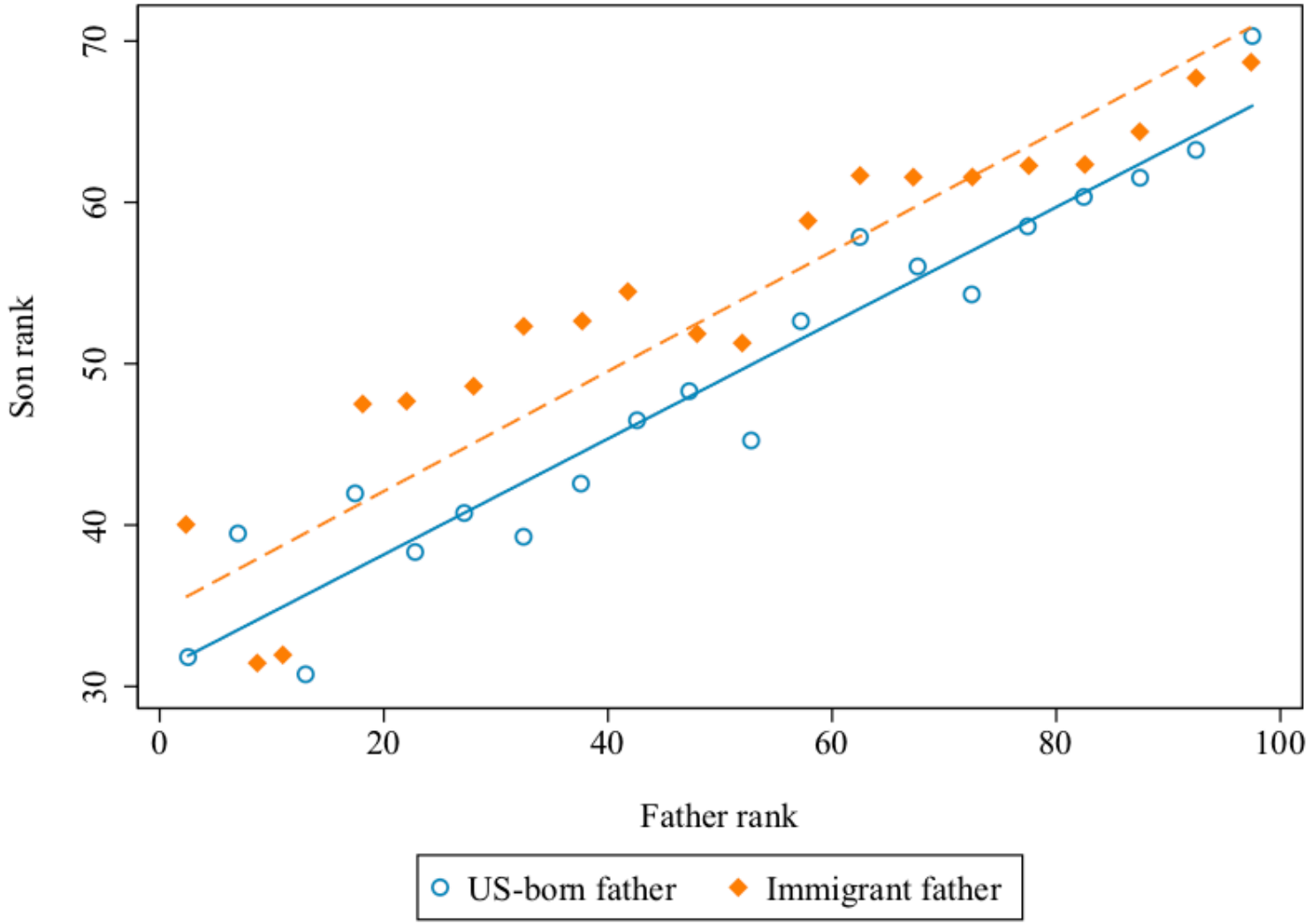
- **Modern Analysis**
  - Opportunity Atlas (Chetty et al. 2018): data assembled from censuses and federal income tax returns, children born c. 1980
  - Includes data on sons and daughters

- **Millions of observations in each case**

$$Rank\ Son = \alpha + \beta_0 2nd\ Gen. + \beta_1 Rank\ Family + \beta_2 2nd\ Gen. \times Rank\ Fam. + \epsilon$$

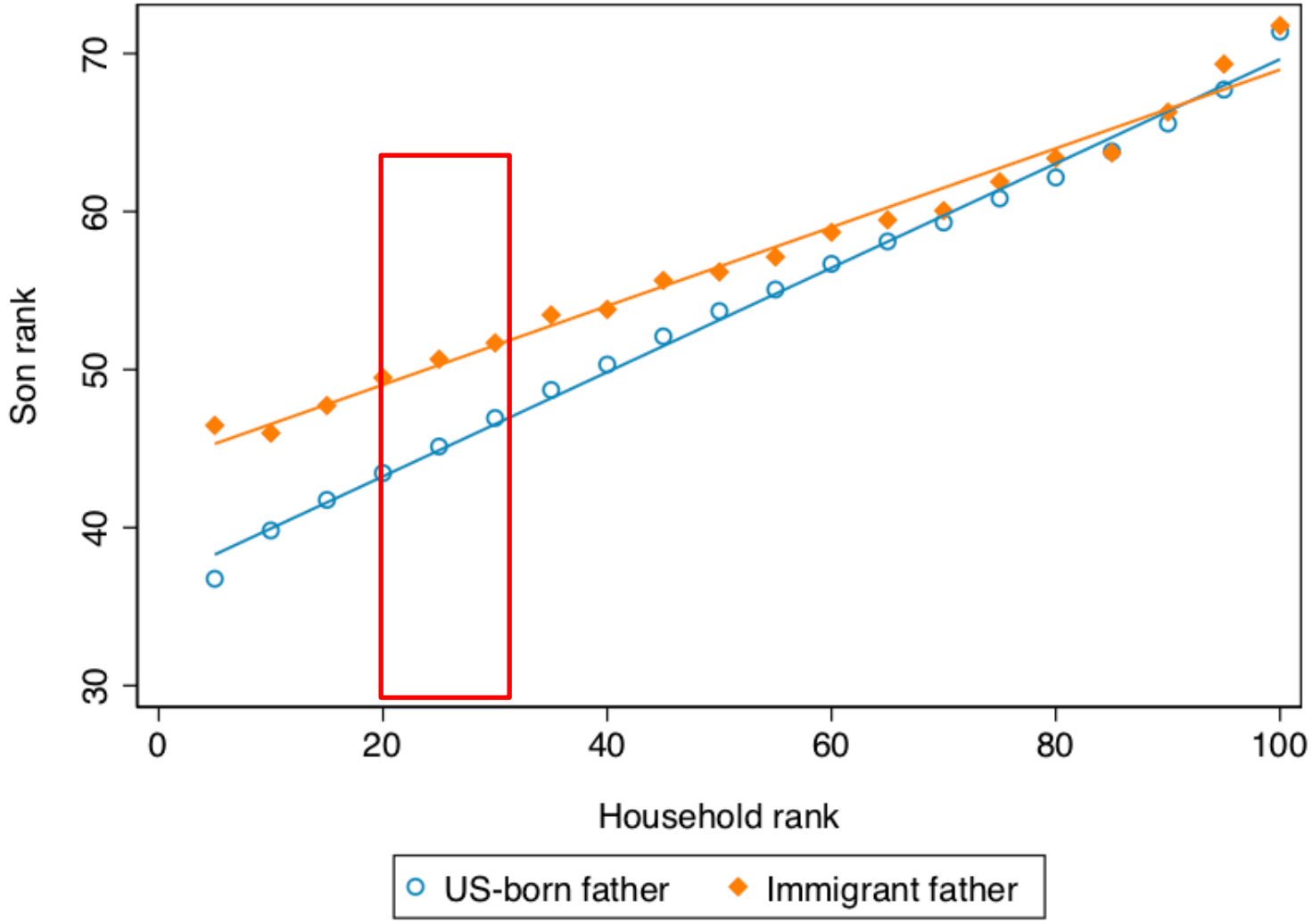
Children of immigrants more upwardly mobile

1910-1940, Census



Children of immigrants more upwardly mobile

Modern, Opportunity Insight



Children of poor immigrants were more upwardly mobile in the past

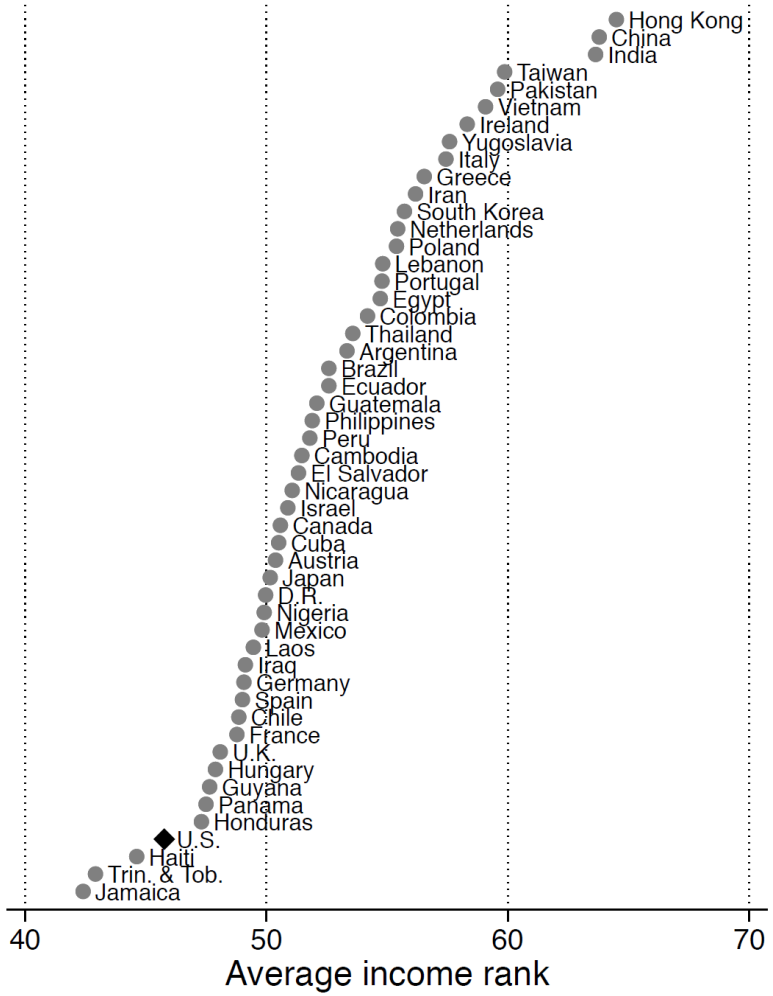
Average income rank for children born to 25th percentile, by father's birthplace

(b) 1910–1940 Cohort

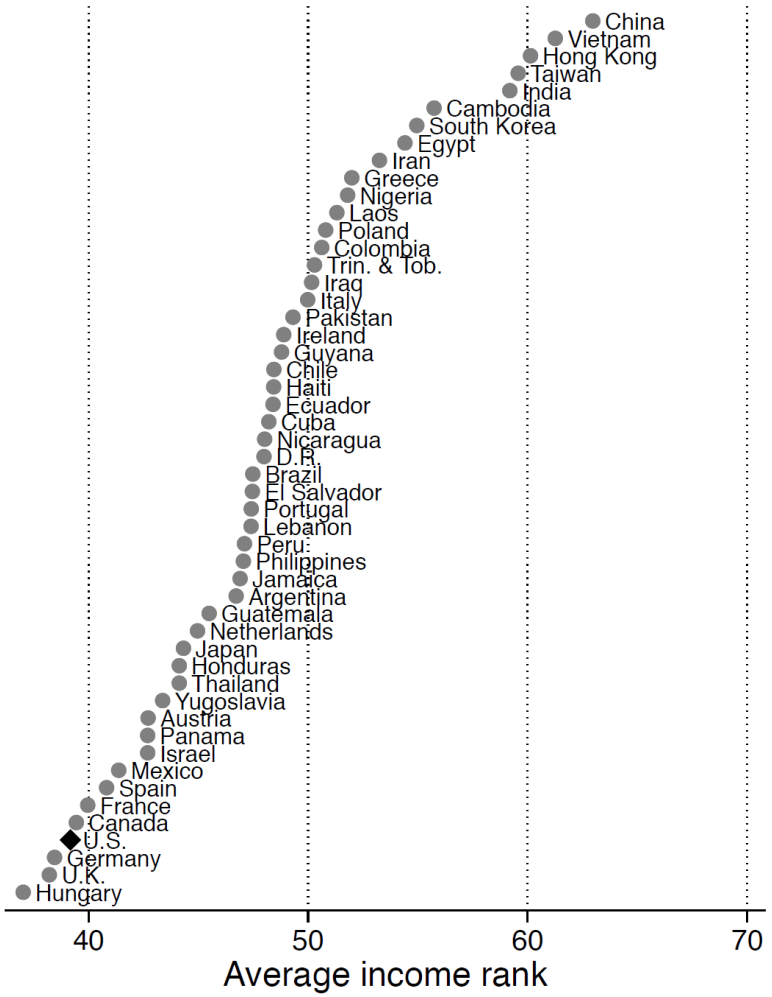
Why? immigrant parents tended to move to areas that offer upward mobility

Children of poor immigrants are more upwardly today, too

(c) Opp. Insights: 1997–2015 Cohort, Sons

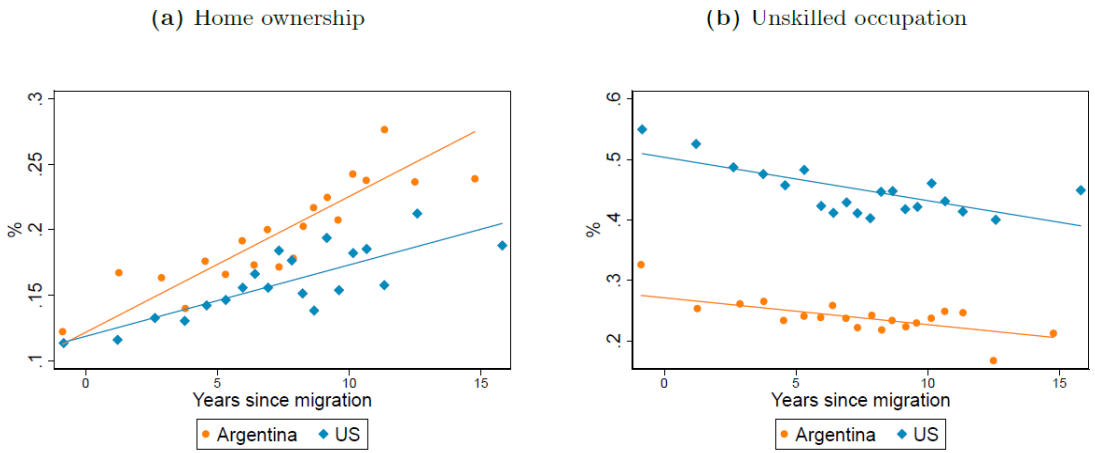


(d) Opp. Insights: 1997–2015 Cohort, Daughters



Italian immigrants to Argentina did better than in US

- unlikely due to selection – because compare immigrants with same occupation and surnames who moved to US vs Argentina



Notes: This figure shows a binned scatterplot of the main economic outcomes (y-axis) on years since migration (x-axis), net of age fixed effects, by country of destination.
Source: Data are from the samples linking passenger lists to the census as described in the main text.

- Italian's advantage in Argentina was because
  - Italians had higher human capital than Argentinians
  - Italian-Spanish similarities

Perez, Santiago, "Southern (American) Hospitality: Italians in Argentina and the US during the Age of Mass Migration," *Economic Journal* (2021)

Same "American Dream" now and 100 years ago

- A novel, not a short story…
- In first chapter, immigrants double income (or more) by leaving home country
- In second chapter, immigrants converge somewhat with US-born workers, but not as fast as myth suggests, then or now
- In third chapter, complete catch-up for children of immigrants from all over the world, both in past and present

Did immigrants hurt the US born?

- Theory/logic: immigrants increase labor market competition, lowering wages and reducing employment among natives
- Logic led to policies to restrict immigration
- Today discuss recent evidence from:
  - Border closure in 1920s
  - Repatriation of Mexican immigrants in 1930s
  - Exclusion of Bracero workers in 1960s

Evidence from 1920s border closure

"The only way to handle it"
Providence Evening Journal, 1921

1921, 1924: immigration quotas that disproportionally reduced immigration from S/E Europe relative to W Europe

Based on country's presence in US in 1910, 1890

Policy only applies to Europe, not to the Americas

Evidence from 1920s border closure

- Idea of research strategy:

1. Before quotas: immigrants from same countries tended to move to same regions in US
2. Quotas affected S/E Europe more than W Europe

- Difference-in-differences + shift share instrument

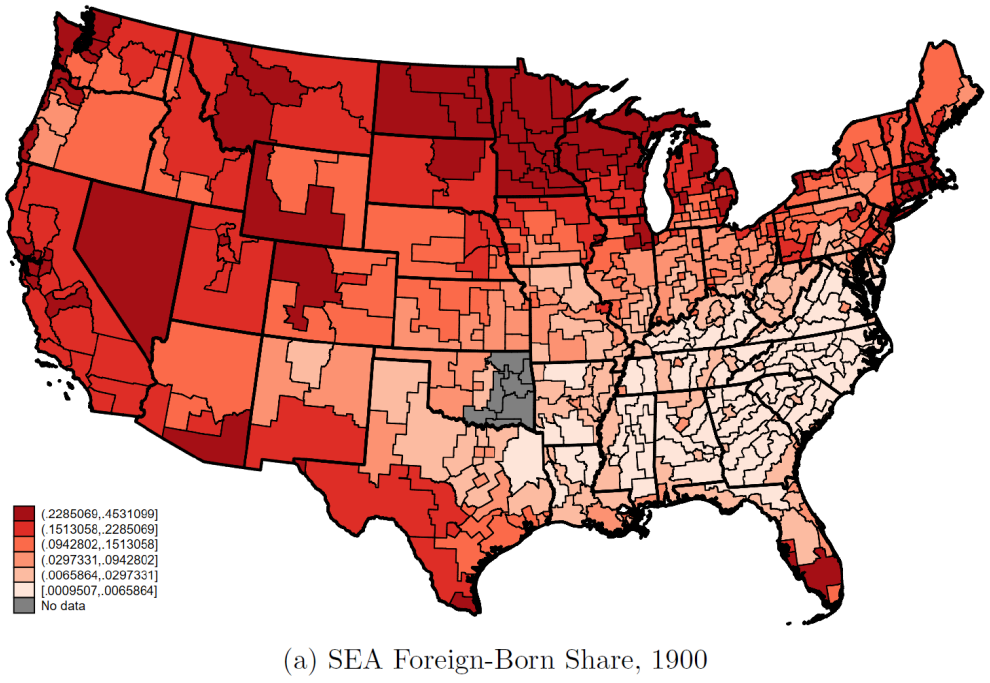
1. Before/after border closure
2. Labor markets more/less exposed to national immigration quota based on historical country-of-origin composition of their immigrant population

Effects of immigration across cities

- Immigration had positive effect on natives' employment
  - Immigration increased natives' employment and occupational standing
  - For every ten new immigrants, two more natives found job
- Immigration did not generate losses even among natives working in highly exposed sectors
- Immigration spurred industrial production
  - Immigration stimulated economic activity, inducing firms to create new jobs

Tabellini, "Gifts of the Immigrants, Woes of the Natives: Lessons from the Age of Mass Migration," *Retud* (2020)

Effects of immigration across entire US



(a) SEA Foreign-Born Share, 1900

Quota-based "experiment": Consider two SEAs, A and B. Both have same foreign-born share in 1900, but in SEA A all foreign-borns are Italians (a more restricted country) while in SEA B all foreign-born are Germans (a less restricted country)

After the quota system is introduced, we would expect immigrant inflow into highly affected SEA A to be lower relative to less affected SEA B

Abramitzky, Ager, Boustan, Cohen, and Worm Hansen, "The Effects of Immigration on the Economy: Lessons from the 1920s Border Closure," *AEJ:Applied* (2022)

Effects of immigration across entire US

- US-born workers in areas losing immigrants did not benefit relative to workers in less exposed areas

- In urban areas, European immigrants were replaced with internal migrants and immigrants from Mexico and Canada

- In rural areas, farmers shifted away from workers
  - farmers shifted toward capital-intensive agriculture
  - the immigrant-intensive mining industry contracted

Effect on science and invention

- Detailed biographical data for 91,638 American scientists, linked to their patents

- Find large decline in arrival of ESE-born scientists after quotas
  - an estimated 1,165 ESE-born scientists were lost to US science
  - equivalent to eliminating a major physics department each year between 1925 and 1955

Moser and San, "Immigration, Science, and Invention. Evidence from the Quota Acts," working paper (2020)

Patents per scientist declined after the quotas

FIGURE 4 –TIME-VARYING EFFECTS OF THE QUOTAS ON PATENTS PER SCIENTIST

Notes: OLS estimates and 95 percent confidence interval of β_t in the regression

$$\ln(y_{it}) = \beta_t ESE_i + \gamma_i + \delta_t + \epsilon_{it}$$

where $\ln(y_{it})$ is the natural logarithm of the number of US patents *per scientist* in field i and year t. The variable ESE_i indicates the pre-quota research fields of ESE-born American scientists; γ_i and δ_t are field and year fixed effects, and 1918-1920 is the excluded period. Standard errors are clustered at the level of research fields.

Research strategy: compare patenting by US scientists in fields that before quota were dominated by ESE-born scientists with fields where US scientists were active inventors

Baseline estimates imply a 68 percent decline in invention

US firms that had employed at least one ESE-born scientists before the quotas produced fewer inventions after the quotas

FIGURE 4 –TIME-VARYING EFFECTS OF THE QUOTAS ON PATENTS PER SCIENTIST

Firms that employed ESE-born scientists experienced a 53 percent decline in invention

Quotas' effects on invention persisted into the 1960s

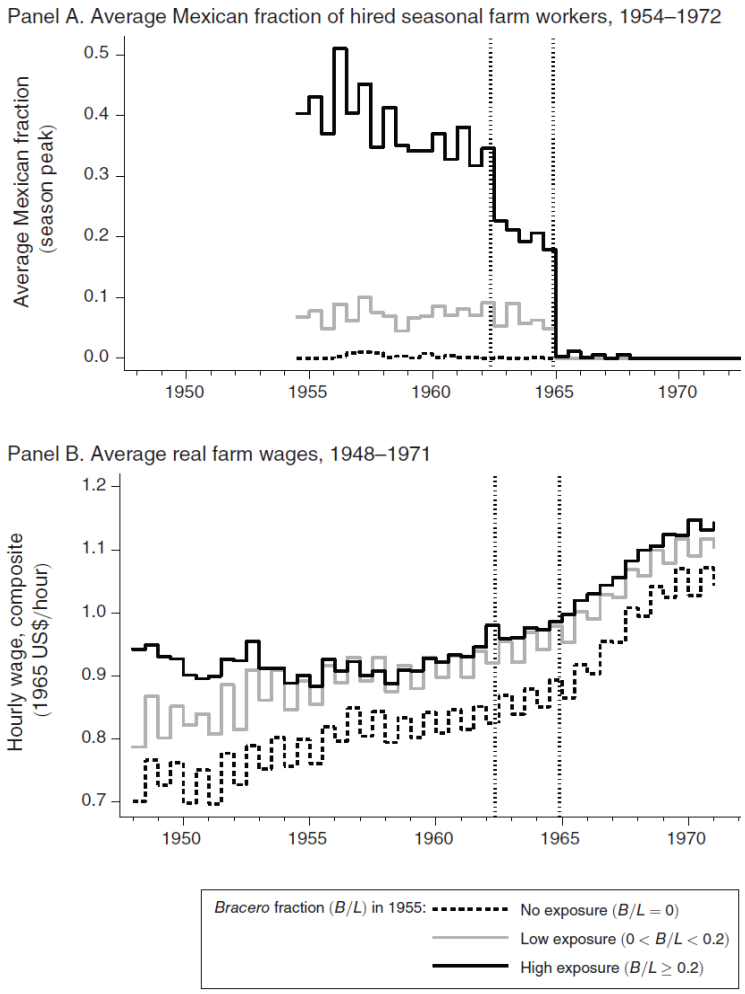
Evidence from Bracero program

how did immigrants affect US born?

- Bracero: agreements (1942–1964) between US and Mexico to regulate bilateral flows of temporary low-skill labor
- ~500K seasonal workers each year from Mexico to US farms under typical contracts between 6 weeks and 6 months
- Johnson administration eliminated the program on December 31, 1964
  - primary goal of bracero exclusion was to improve wages and employment for domestic farm workers

Clemens, Lewis, and Postel, "Immigration Restrictions as Active Labor Market Policy: Evidence from the Mexican Bracero Exclusion," *AER* (2018)

Research strategy: compare states with high exposure to exclusion (black line) to states with low/no exposure (grey lines)



High-exposure states: Arkansas, Arizona, California, New Mexico, South Dakota, and Texas, where *braceros* made up more than 20 percent of hired seasonal farm labor in 1955

Main finding: bracero exclusion had little effect on wages of domestic farm workers

Mechanism: Rather than hiring more workers, immigration restriction encouraged farmers to innovate labor-saving technologies in crops that lost Bracero workers (San 2021)

Evidence from Mexican repatriation

- 1929-1934: ~400,000 Mexicans and their children (many of whom American Citizens) were subject to a range of measures to return to Mexico (from encouragement to facilitation, pressure and outright forceful repatriation)
- Goal by national and local authorities was to create jobs for the natives by removing Mexicans who were "taking away" employment opportunities
- Use linked data on natives in 1930 and 1940 Censuses
- Challenge: don't observe Mexicans who returned

Jongkwan, Peri, and Yasenov, "The labor market effects of Mexican repatriations: Longitudinal evidence from the 1930s," *Journal of Public Economics* (2022)

Mexican repatriations resulted in reduced employment for US-born workers

- Research strategy: instrument county level drop in Mexican population with size of the Mexican communities in 1910 and its interaction with repatriation costs (railway line to Mexico)

- Finding: Mexican repatriations resulted in reduced employment and occupational downgrading of native workers

- Interpretation: these patterns are consistent with Mexican workers being important for local agglomeration economies, and for attracting unskilled-intensive industries

NOT to say immigrants never crowd out native-born

- Immigration could reduce the employment opportunities of competing native workers
  - Those with similar education-experience (Borjas 2003, Borjas and Doran 2012), including blacks (Borjas, Grogger, and Hanson (2006), and previous immigrants

- But overall story is not as simple as "immigrants necessarily hurt US-born"

What we learn from the past

- Similar pace of economic convergence
- Catch up takes place in the second generation
- Short-term view undermines immigrants' success
- Story is not as simple as "immigrants crowd out US-born"


thank you
danke
謝謝
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dank je
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tapadh leat
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kop khun krap
go raibh maith agat
arigato
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dakujem
grazie
terima kasih
merci
감사합니다
мерси

Lecture 5:
Immigration: culture and politics

- How rapidly do immigrants assimilate *culturally*? Has this changed over time?

- Is it really true that immigrants integrate more slowly into society than past immigrants?

Abramitzky, Boustan, and Eriksson, "Do Immigrants Assimilate More Slowly Today Than in the Past?" *AER:Insights* (2020)

How did immigrants assimilate *culturally* in US?

- Measuring cultural assimilation is a challenge because data on cultural practices (food, dress, accent) are often not collected
- We study the names parents choose for their children

- Past: using 5M census records from 1920 and 1940
- Present: 10M CA birth certificate records from 1989-2015

- Also: marrying outside of group, speaking English, citizenship

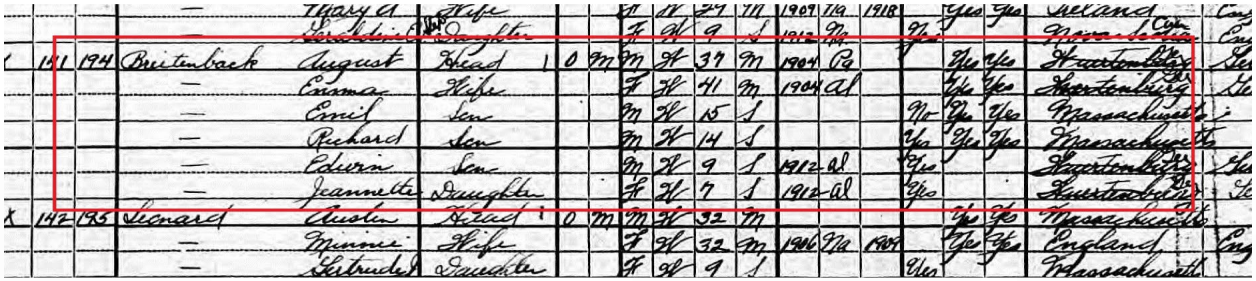
How did immigrants assimilate *culturally* in US?

- Names are signals of cultural identity; reflect a *choice* to assimilate
- Giving a child an American-sounding name is a financially cost-free way of identifying with U.S. culture
- Trading off maintaining cultural identity for benefits of assimilation
- Thus, we trace assimilation process by examining changes in names immigrants gave their children as they spent more time in US
- Caveat: positive, not normative, analysis

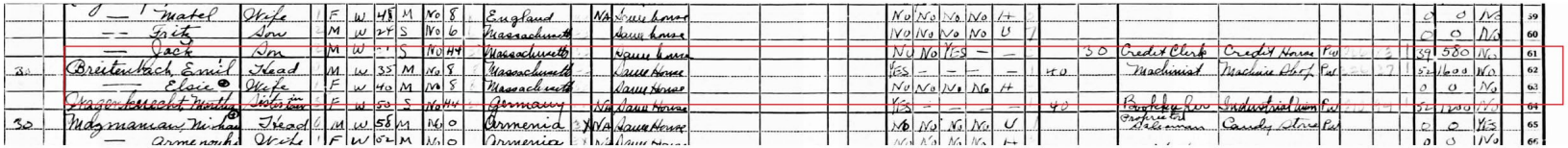
What names did immigrants choose for their children?

Census manuscripts of the Breitenbach family 1920

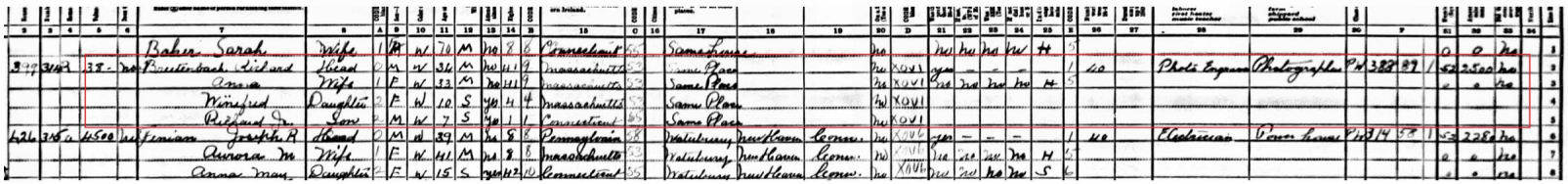
A. Childhood household in 1920



B. Emil Breitenbach in 1940



C. Richard Breitenbach in 1940



Did the Abramitzky family assimilate?

(2014 census…)

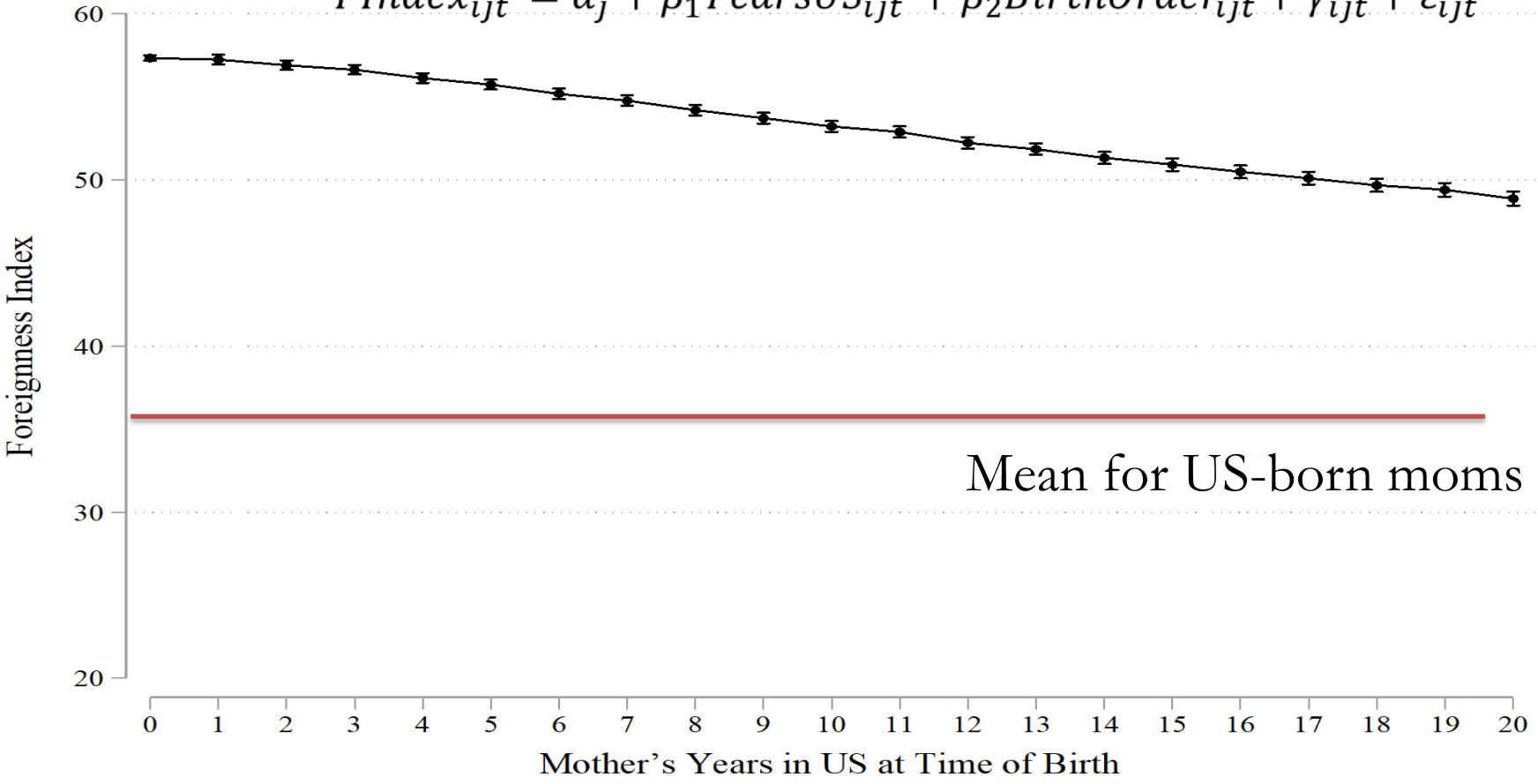
	NAME	AGE	BIRTH PLACE
66	Abramitzky, Ran	40	ISRAEL
67	———, Noya	-	ISRAEL
68	———, Roee	10	ILLINOIS
69	———, Ido	7	CALIFORNIA
70	———, Tom	4.	CALIFORNIA.

Abramitzky Family:

Ran Abramitzky (Head, Age 40, Born in Israel)
Noya Abramitzky (Wife, Age XX, Born in Israel)
Roee Abramitzky (Son, Age 10, Born in Illinois)
Ido Abramitzky (Son, Age 7, Born in California)
Tom Abramitzky (Son, Age 4, Born in California)

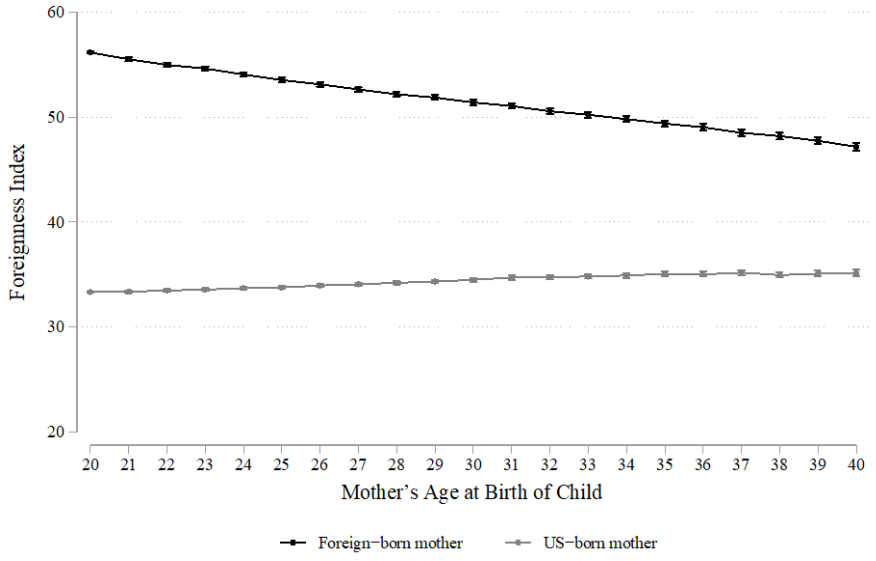
Measuring assimilation as name foreignness

$$FIndex_{ijt} = \alpha_j + \beta_1 YearsUS_{ijt} + \beta_2 BirthOrder_{ijt} + \gamma_{ijt} + \varepsilon_{ijt}$$

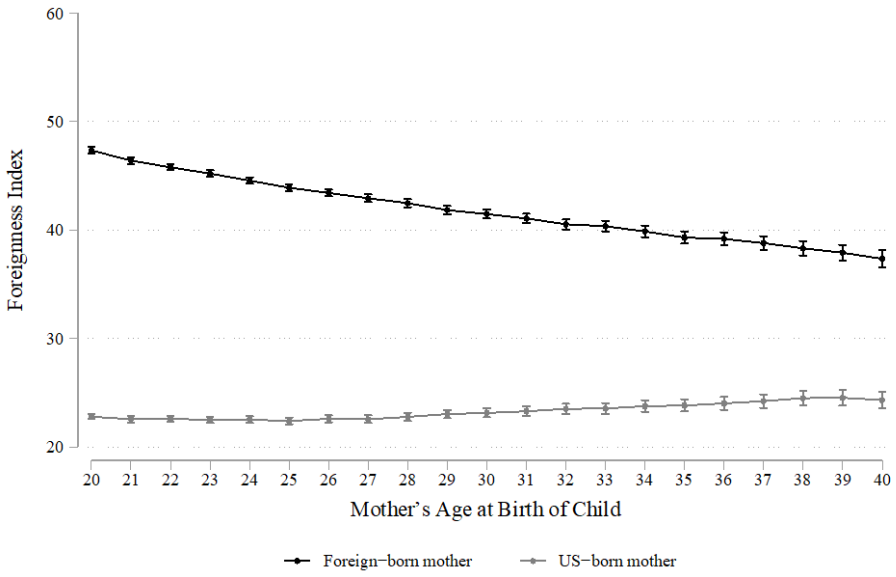


Assimilation rates similar over time

(A) Historical data (1920 Census)

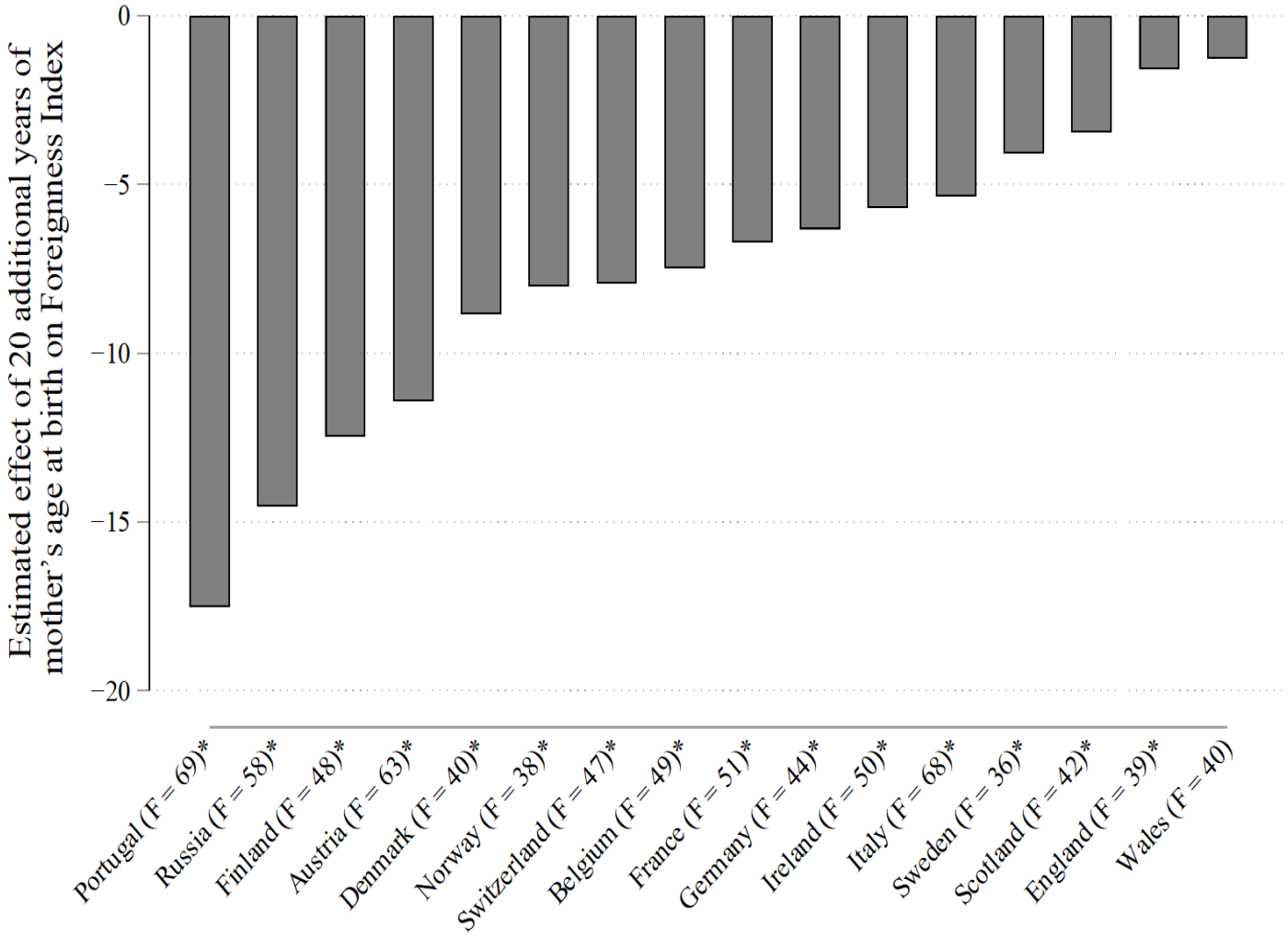


(B) Modern data (CA birth certificates)

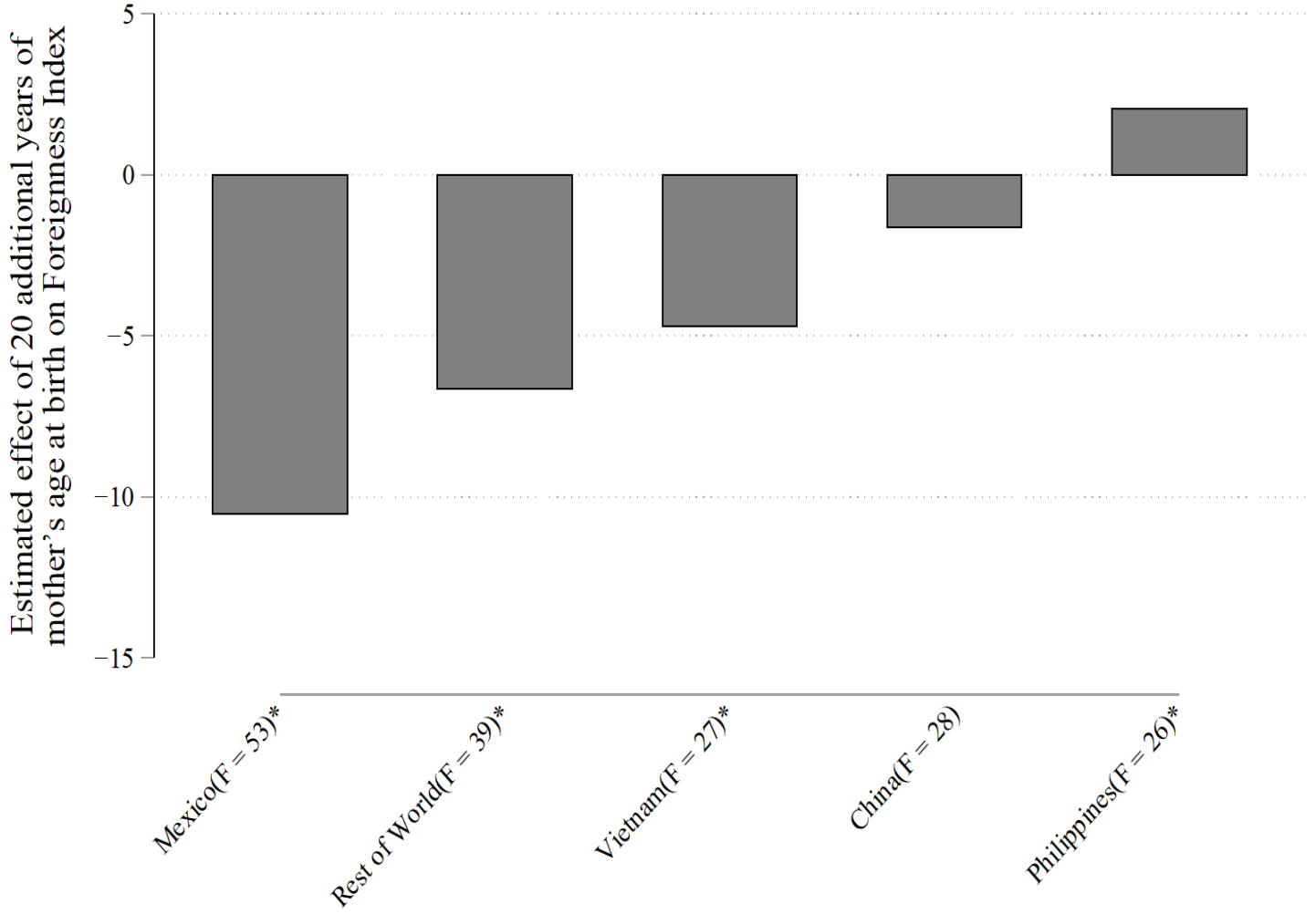


Convert to mother's age at birth (not years in the US at birth) to compare with US-born and to compare over time to CA birth certificates

Look at which immigrant groups assimilate quickly, past



Look at which immigrant groups assimilate quickly, today



Immigrant parents gave their children less foreign names as they spent more time in US

- Shift in name choices was similar for more/less educated mothers
- Bigger shift in name choice for immigrants with foreign last name
- Somewhat faster name assimilation in families in which both parents were foreign born
- Faster name-based assimilation when only father is foreign born than when only mother is foreign born
- Bigger shift for immigrants who lived in immigrant enclaves

Other measures also suggest cultural assimilation

- By 1930, more than two-thirds of immigrants had applied for citizenship and almost all reported they could speak some English

- A third of first-generation immigrants who arrived unmarried and more than half of second generation immigrants wed spouses from outside their cultural group

Forced assimilation can backlash

- Before WWI, bilingual education was common in many states
- After WWI, Ohio and Indiana barred the German language from their schools
- Using linked census records and WWII enlistment data
- DID: compare cohorts at school with older cohorts in states with and without a German ban

Focus on border counties to increase comparability

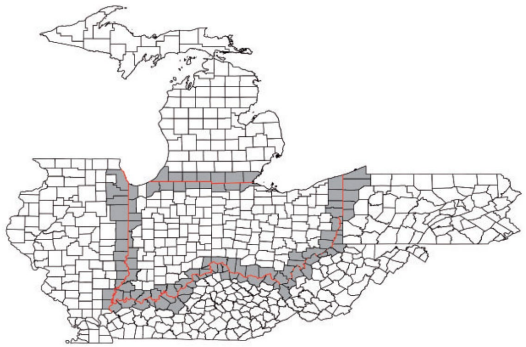


FIGURE 1
Counties on the borders of Indiana and Ohio

Fouka, "The Unintended Effects of Language Prohibition in US Schools after World War I," *Restud* (2020)

Forced assimilation can backlash

- Affected individuals were less likely to volunteer in World War II and more likely to marry within their ethnic group and to choose decidedly German names for their offspring

- Rather than facilitating the assimilation of immigrant children, the policy instigated a backlash, heightening the sense of cultural identity among the minority

Effects of immigration on economic prosperity

- Context: European immigration to US during Age of Mass Migration
- Research strategy: exploiting cross-county variation in immigration that arises from the interaction of fluctuations in aggregate immigrant flows and of the gradual expansion of the railway network
- Finding: Counties with more historical immigration have today higher income, less poverty, less unemployment, higher rates of urbanization, and greater educational attainment

Sequeira, Nunn, and Qian, "Immigrants and the Making of America," *Restud* (2020)

End with puzzle

- Despite positive outcomes, anti-immigrant sentiment seems to be high/rising

- Or is it…?

Despite positive outcomes, anti-immigrant sentiment seems to be high/rising

"Assimilation has been very hard. It's almost, I won't say nonexistent, but it gets to be pretty close. And I'm talking about second and third generation — for some reason there's no real assimilation."

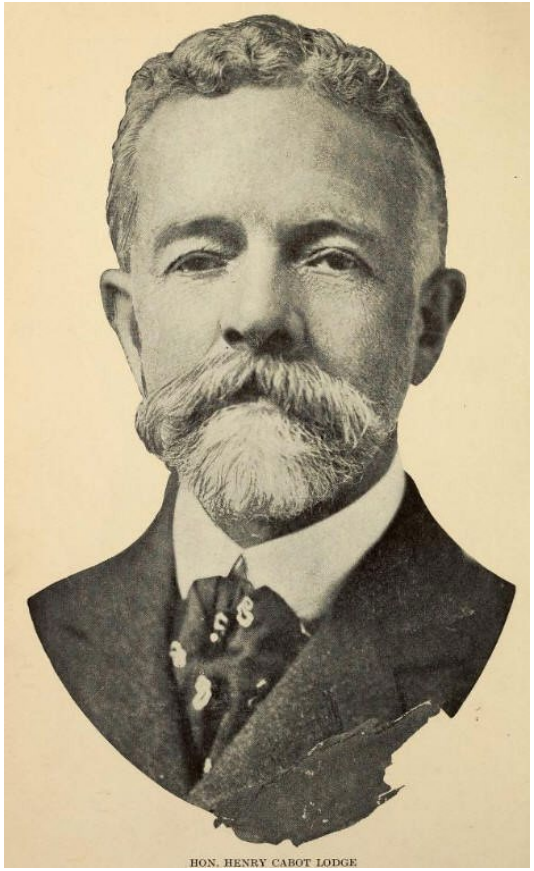
- Donald Trump, 2015

Is this new?

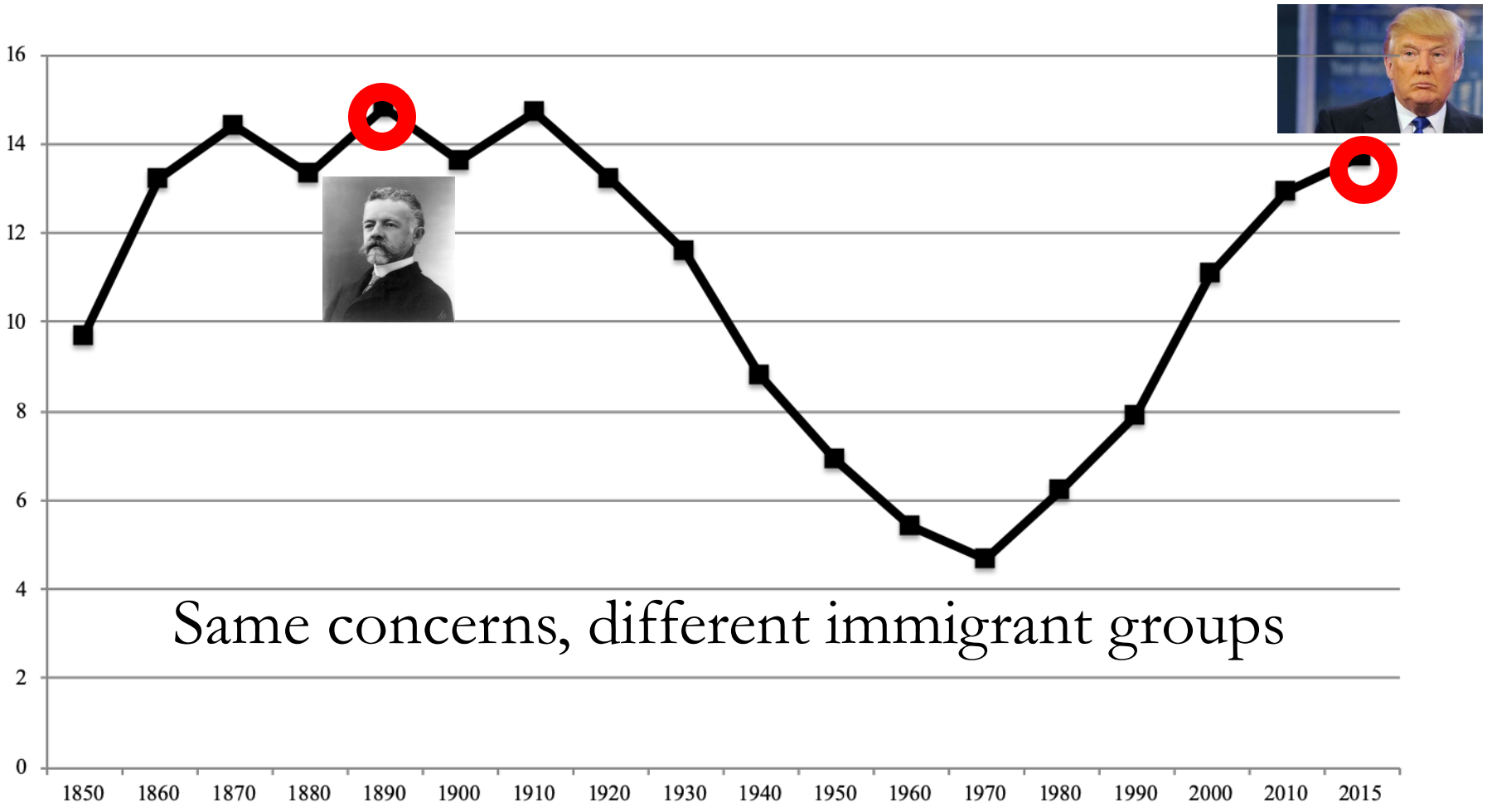
How has anti-immigration sentiment changed over time?

Immigrants are "from races most alien to the body of American people and from the lowest and most illiterate classes of these races"

- Sen. Henry Cabot Lodge, 1891



When immigrants reach 14%...

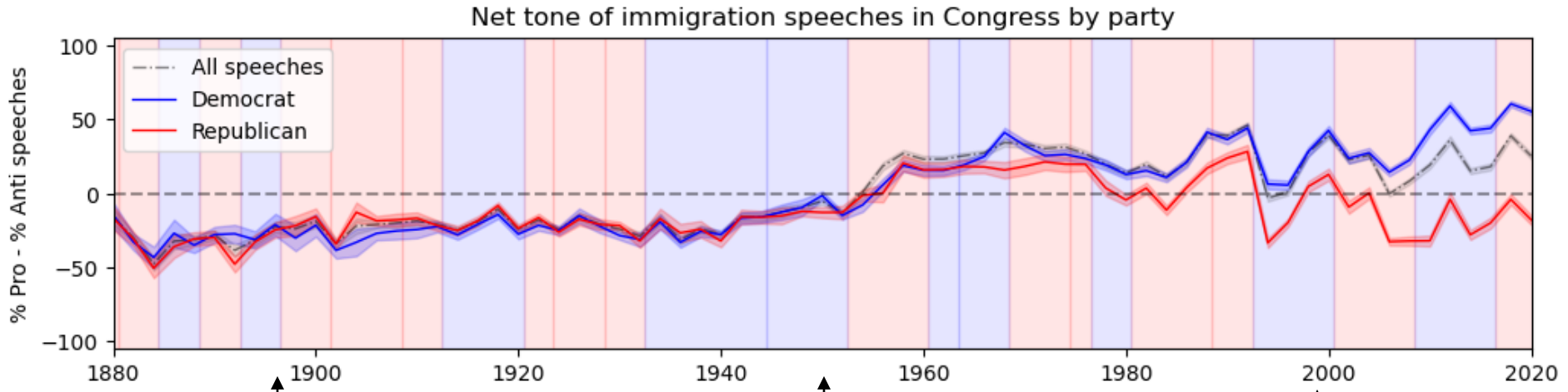


Congressional speeches about immigration more positive but more polarized today

(with Chris Becker, Dallas Card, Serina Chang, Dan Jurafsky, Rob Voigt)

- 8 million speeches; 200,000 pertain to immigration
- Research team classified random congressional speeches:
    1. as being about immigration or not and
    2. as having a positive or negative (or neutral) tone toward immigrants
- Use machine learning to scale up coding to full corpus

Average tone more pro-immigrant over time, but increasingly polarized by party

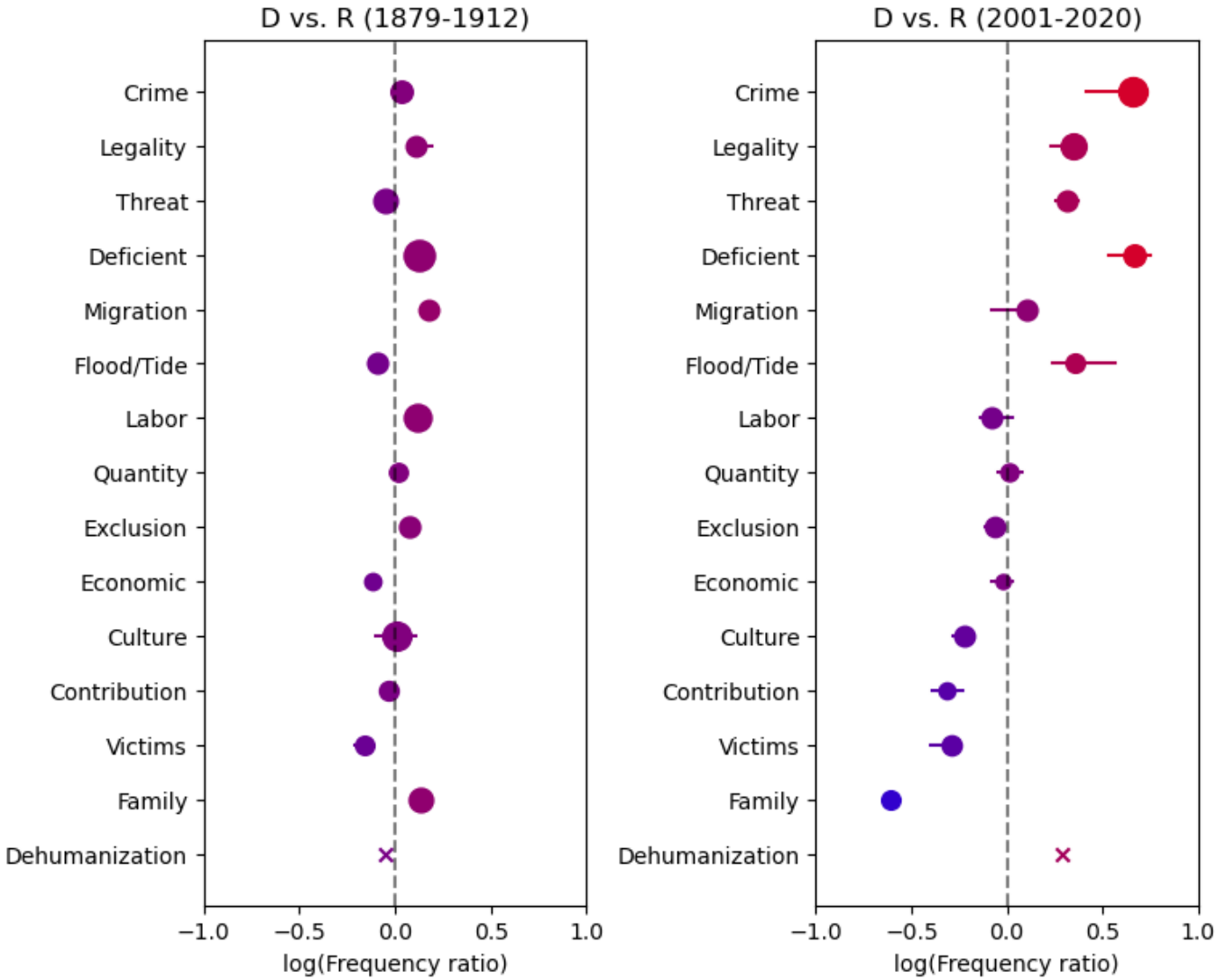


(1) Consistently negative 1880-1940

(2) Transition after WWII

(3) Positive but polarized 1965-today

Partisan gap emerges. Focus on crime/ legality (GOP) and family/victims/contribution (Dem)



Immigration policy with a long view

- Tone in congressional speeches – and American public opinion – more positive toward immigration than ever

- Our research can help explain why. Immigrants readily become Americans and their children move into the middle class and beyond


thank you
danke
謝謝
ngiyabonga
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спасибо
dank je
gracias
tapadh leat
bedankt
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hvala
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grazie
terima kasih
merci
감사합니다
мерси

Lecture 6 – Urbanization

- Why does economic activity concentrate in space?

- Locational fundamentals – Some areas are more productive than others (e.g., climate, access to coast)

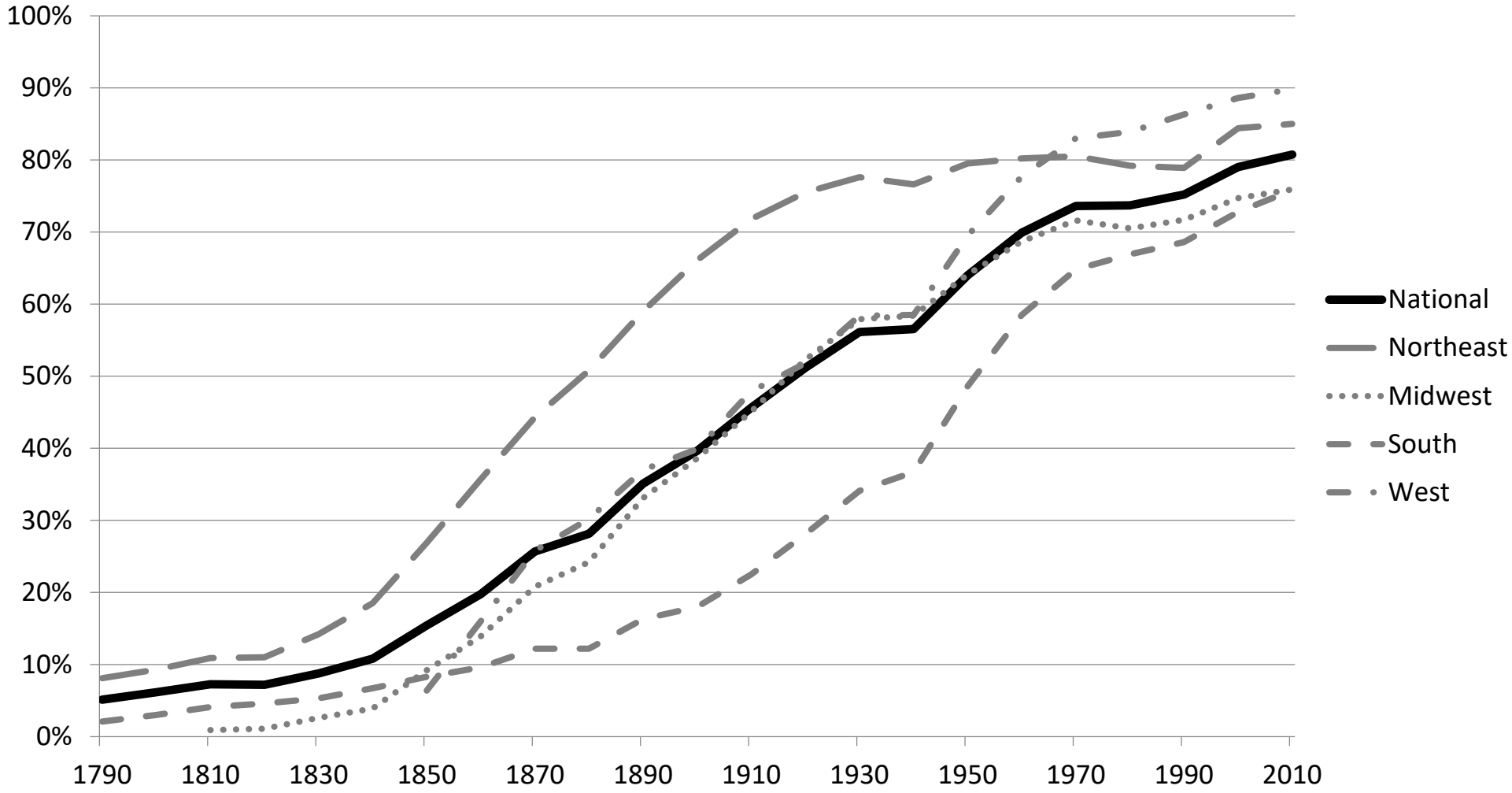
- Increasing returns to scale/agglomerations – Small differences in initial conditions may matter if proximate individuals and firms augment each others' productivity
  - Mechanisms: Knowledge spillovers, labor market pooling (or other inputs)

- Key to distinguishing the models: Agglomeration economies predict that temporary shocks can be permanent. Removing an economic "fundamental" (e.g., with changes in transport technology) may not erode a city's size

- Role of infrastructure and transportation technology both across and within cities

Urbanization in US: 1790-2010

Census definition = In town with 2,500+ population



A foundational debate

- Davis and Weinstein (2002) – Locational fundamentals
- Bleakley and Lin (2012) - Agglomerations
- Long follow-on literature… Even some work going back to ancient world – Michaels and Rauch, 2018; Fluckiger, et al. 2021 on Roman Empire, Bosker et al., 2013, 2017 on Europe; Bakker, et al. 2021 on Iron Age

Locational fundamentals: Cities with more war-related population loss have higher pop. growth post-war

- Census data on 300 Japanese cities from 1925
- Firebombing was strategic but effectiveness had an idiosyncratic component
- Cities that experienced the most damage during the war rebounded the fastest in the decade afterwards, even controlling for governmental aid
- Suggests that locational advantages were stronger than draw of agglomerations in other areas. But infrastructure and social networks were not destroyed…

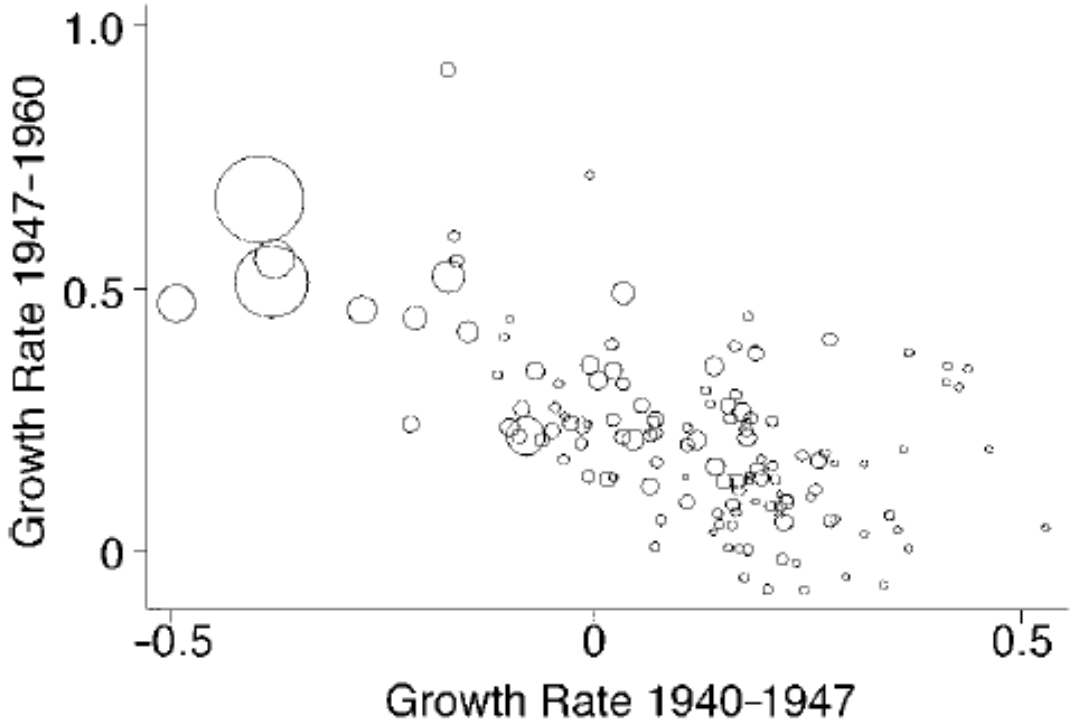
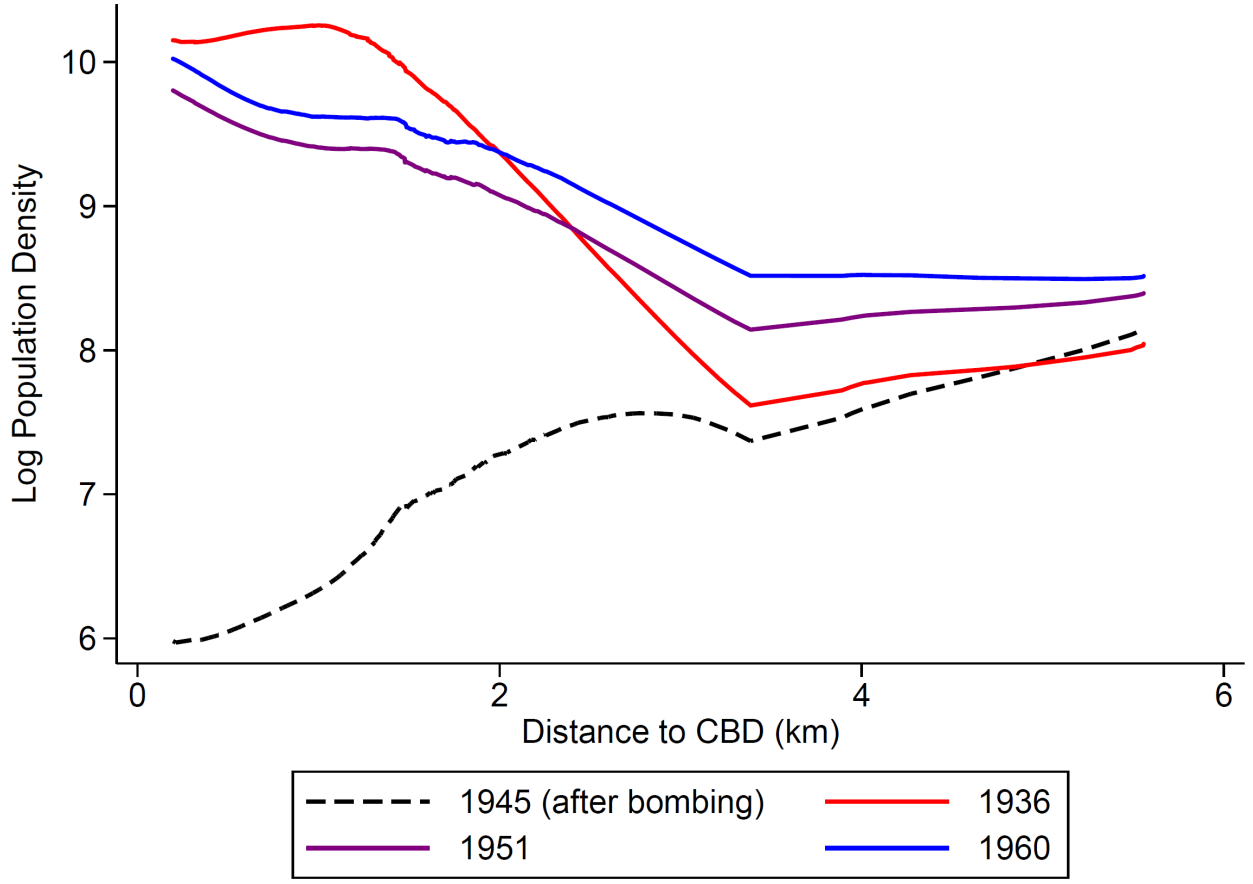


FIGURE 1. EFFECTS OF BOMBING ON CITIES WITH MORE THAN 30,000 INHABITANTS

Note: The figure presents data for cities with positive casualty rates only.

Source: Davis and Weinstein, AER 2002

Bounce-back occurred in Hiroshima and Nagasaki in total population – and in "monocentric" nature of the city



Source: Takeda and Yamagishi, 2022

Agglomerations: Cities persist at historical portage sites even after (temporary) locational advantage ended

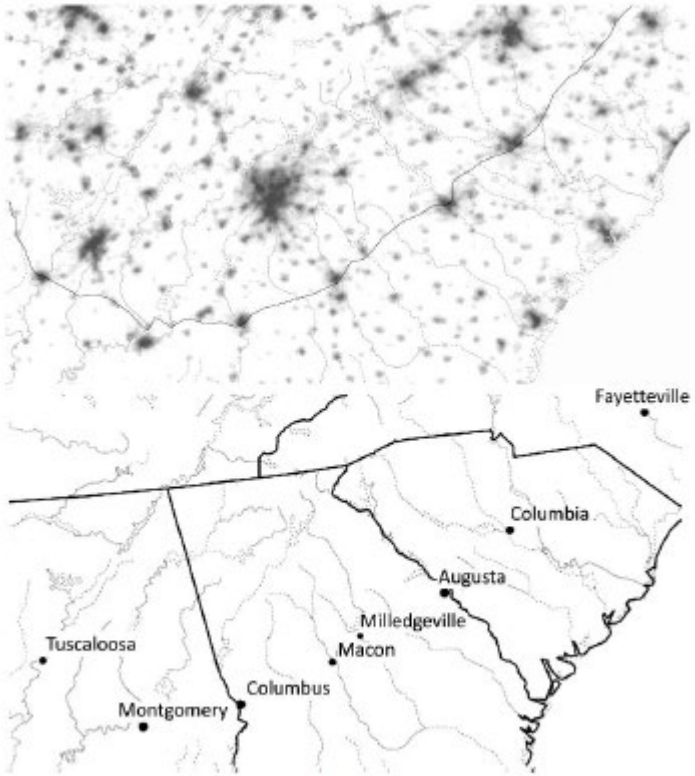


FIGURE II
Fall-Line Cities from Alabama to North Carolina

- Fall line = Junction between upland and coastal plain
- When fall line is crossed by a river, rapids form. In past, generated portage cites (carrying canoe)
- As a result, commercial zones developed in the past. And cities remain in these locations today!
- Suggest that forces of agglomeration render historical advantages relevant in the present (persistence)

Source: Bleakley and Lin, QJE 2012

Proximity to historical portage site predicts contemporary population density

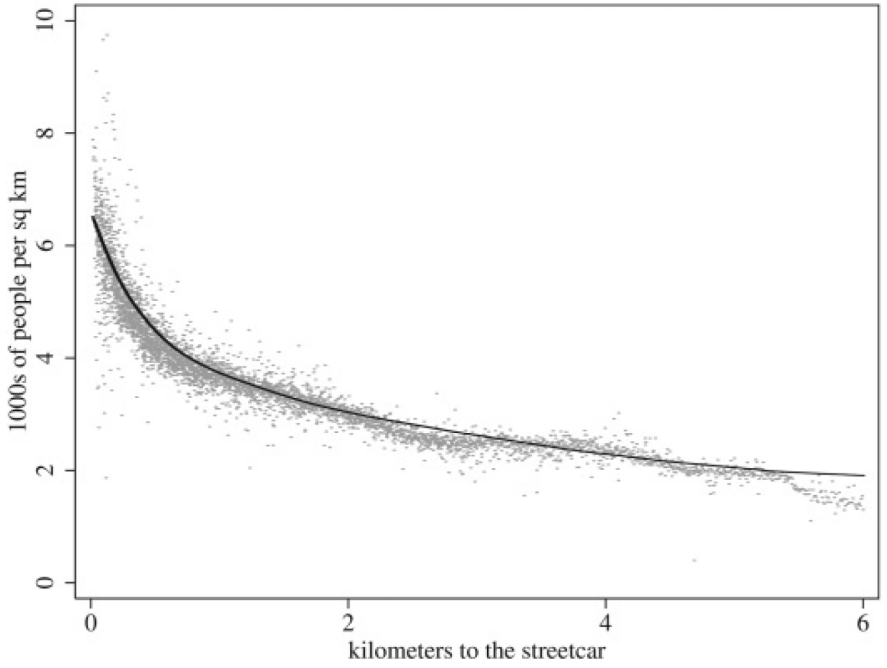
	(1) Basic	(2) Other spatial controls	(3)
Specifications:		State fixed effects	Distance fron various featur
Explanatory variables:			
Panel A: Census Tracts, 2000, N = 21452			
Dummy for proximity to portage site	1.113 (0.340)***	1.009 (0.321)***	1.118 (0.243)***
Distance to portage site, natural logs	−0.617 (0.134)***	−0.653 (0.128)***	−0.721 (0.118)***
Panel B: Nighttime Lights, 1996–97, N = 65000			
Dummy for proximity to portage site	0.504 (0.144)***	0.445 (0.127)***	0.490 (0.161)***
Distance to portage site, natural logs	−0.188 (0.065)***	−0.159 (0.065)**	−0.151 (0.090)

- Dependent variable in Panel A = ln(population density)
- Dummy =1 if area is 15 miles or less from portage site
- If <15 miles away, density = 110% greater
- Beyond that, increasing distance from portage by 100% reduces density by ~60%
- Control for other vintage capital: Universities, railroads, industrial composition, etc.

Persistence at smaller levels: Proximity to street car stop predicts density in LA today. Institutional mechanism.

- Street cars built between 1890-1910; replaced by road travel
- Last street car pulled out in 1963 but still predicts density today
- Not due to vintage capital (= true also of new construction); not due to road grid. Explained by zoning regulations

FIGURE 1.—MODERN POPULATION DENSITY STRONGLY RELATED TO STREETCAR LOCATION



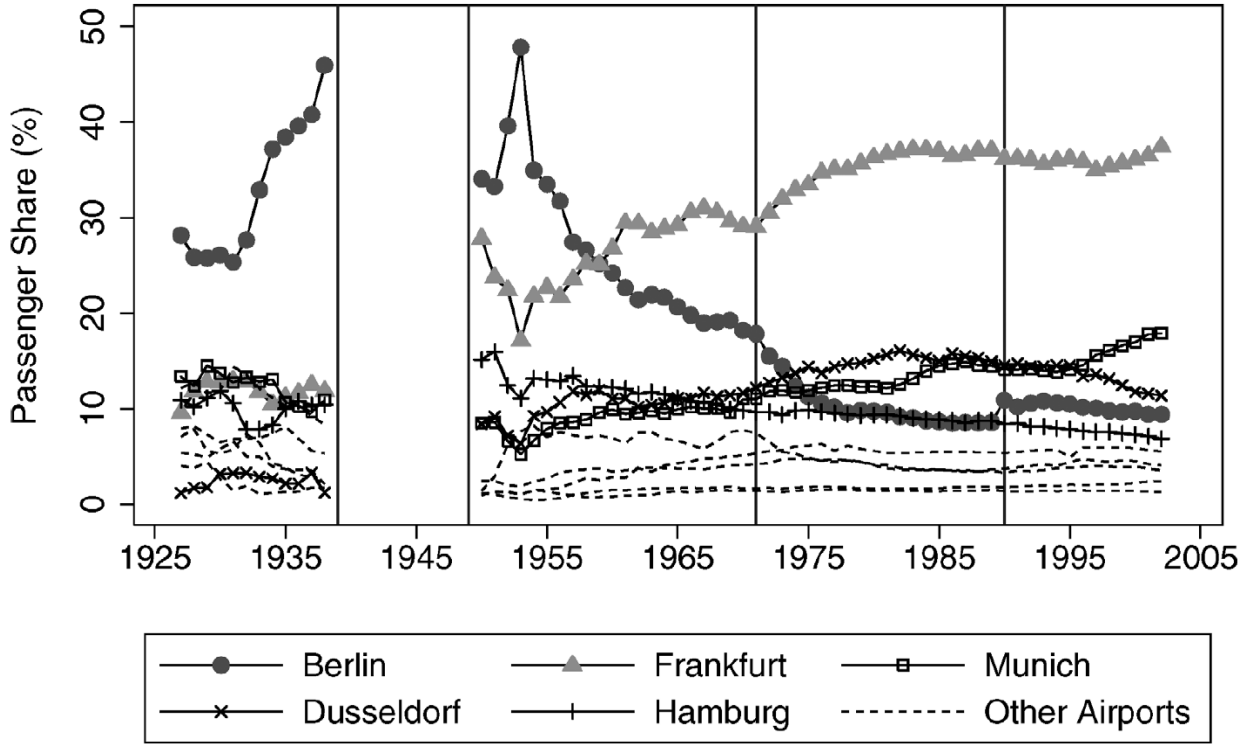
The figure shows a pattern of declining 2010 population density with distance to the streetcar. Each point is the average tract density of approximately 400 parcels. The line is a local linear regression estimated with a tricube weight and a bandwidth of 0.3.
Sources: Density information comes come from the 2007–2011 American Community Survey census tract level data, expressed in terms of 1940 census tract boundaries. We calculate distance to the streetcar for each parcel in the county based on our digitization of streetcar maps.

Source: Brooks and Lutz, ReStat 2018

Another mechanism: Temporary shocks can have permanent effects on infrastructure network

- Division of Germany after World War II led to a shift in the central air hub from Berlin to Frankfurt
- After the reunification, air travel did not shift back
- Frankfurt did not have obvious advantage over other cities (in terms of GDP or distance to markets)
- Possibility of multiple steady states; role of initial conditions

FIGURE 2.—AIRPORT PASSENGER SHARES
DEPARTING PASSENGERS AT THE TEN MAIN GERMAN AIRPORTS

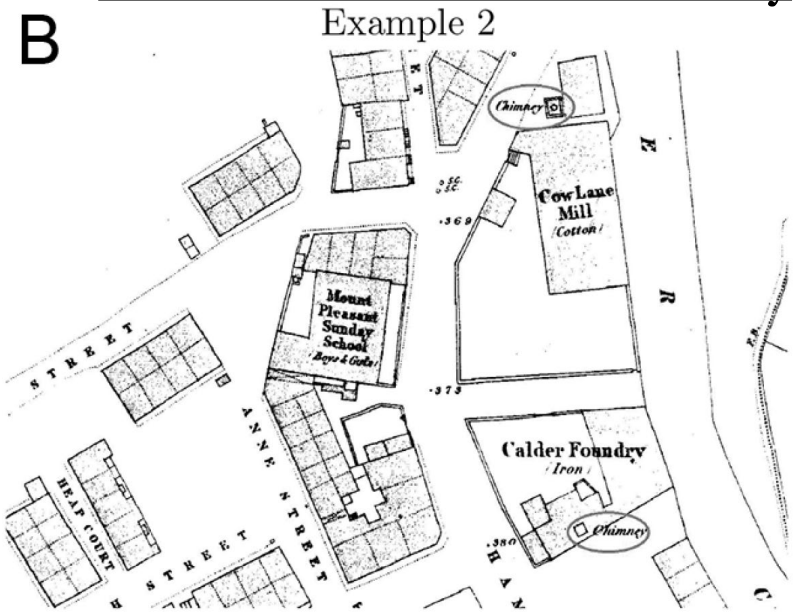


Source: Redding, Sturm, Wolf, ReStat 2011

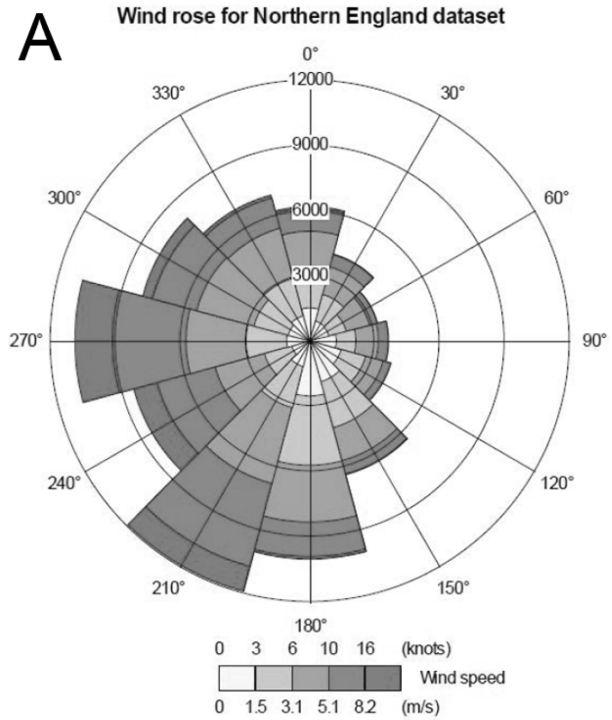
Endogenous persistence (i.e., without institutional support)

Neighborhoods that are upwind from an industrial chimney that omitted pollution from 1870s-1950s are still lower income today. Proposed mechanism is ***endogenous*** location amenities (including neighbor income)

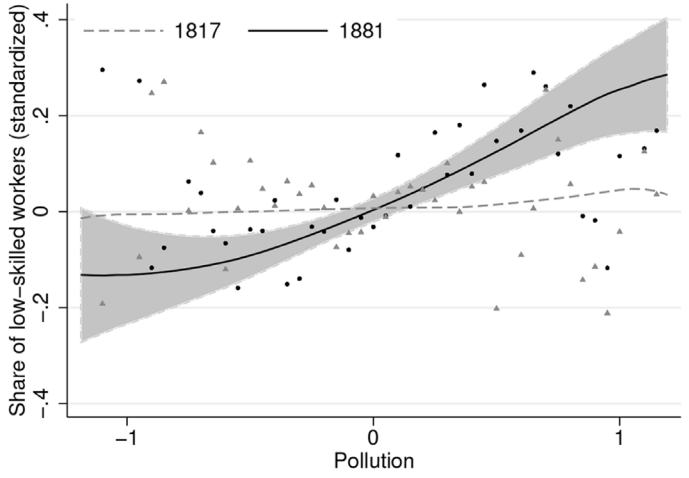
Distance to industrial chimney

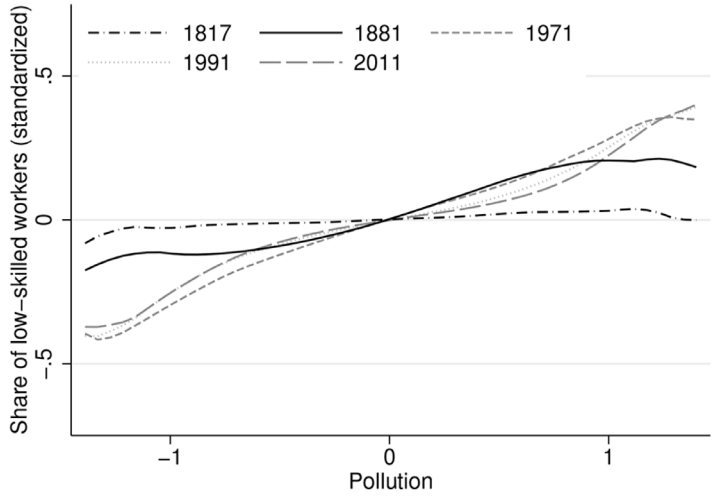


Interacted with wind direction

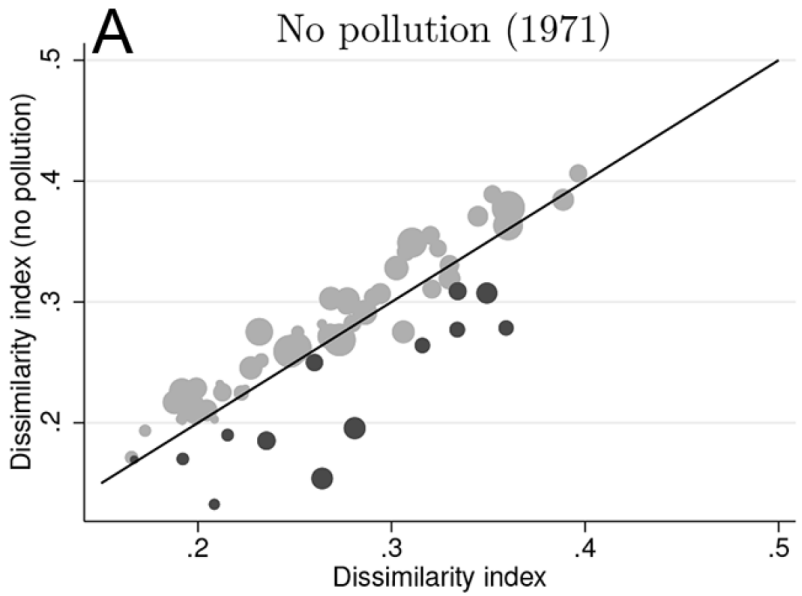


Source: Heblich, Trew and Zylberberg, JPE 2021





Step 1: Imputed pollution in neighborhood associated with % low skilled workers from 1881 onward, but not in 1817 before the Industrial Revolution began in earnest



Step 2: Estimate model of neighborhood choice with two types of workers (low/high skill) and moving frictions. Then use to estimate a no-pollution counterfactual. Cities with high pollution levels (dark gray) would have lower segregation levels if historical pollution had not taken place

Shocks matter when geography is homogeneous. German areas resettled after WWII

Before shock

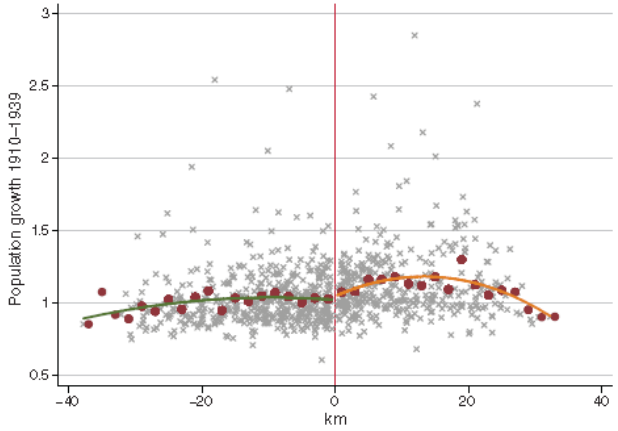


FIGURE 2. POPULATION GROWTH 1910–1939

Short run (1950)

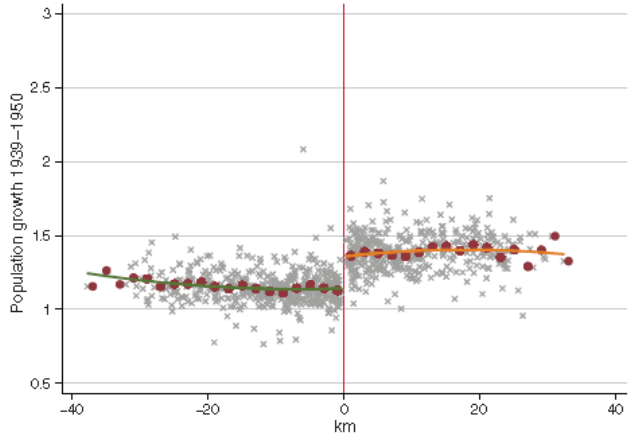


FIGURE 4. POPULATION GROWTH 1939–1950

Long run (1970)

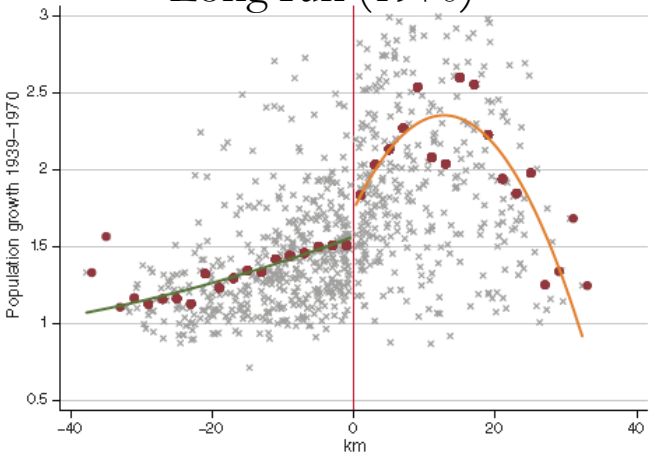


FIGURE 6—POPULATION GROWTH 1939–1970

- Millions of Germans returned after War. Allowed to settle in US, UK and Soviet zones, but not in French zones
- In short run, increased population across border by 22%, in long run, by 17%.

Source: Schumann, AEJ 2014

Persistent segregation and neighborhood flux can co-exist, depending on city's heterogeneity in natural amenities

More homogeneous cities have more neighborhood change and shocks matter more

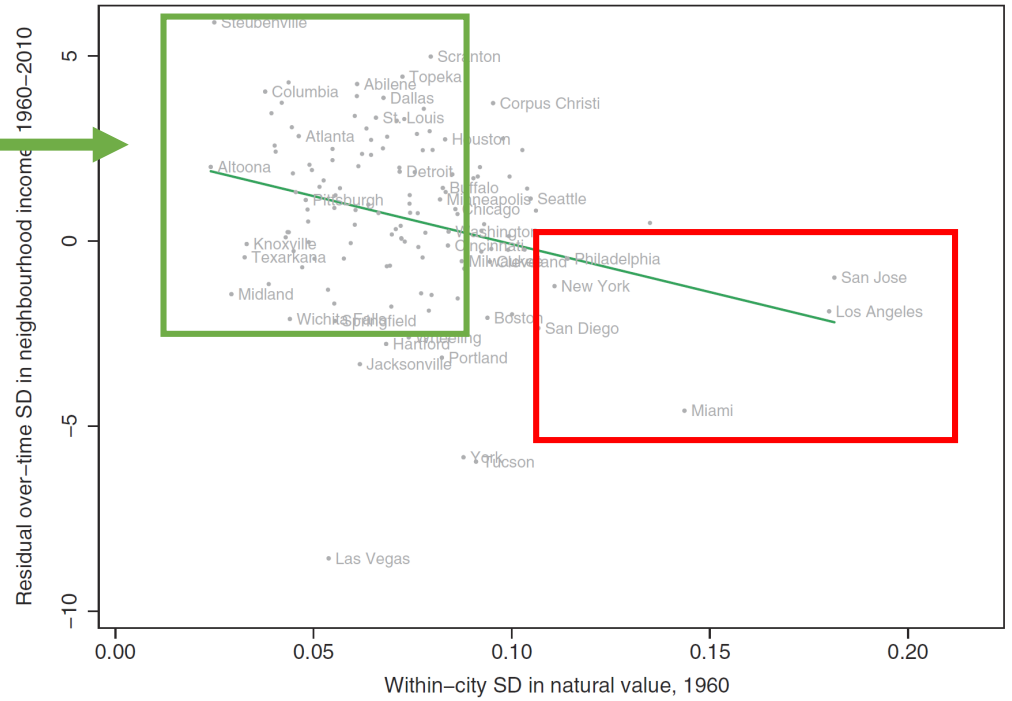


FIGURE 6

Persistence: neighbourhoods in naturally heterogeneous cities experience smaller over-time fluctuations in income

Notes: This plot shows time-series variation in neighbourhood percentile rank and cross-sectional variation in neighbourhood natural amenities. The vertical axis measures the metropolitan-level residual from a regression of mean neighbourhood 1960–2010 standard deviation (SD) in percentile rank by income (×100) on within-metropolitan SD in neighbourhood income and log changes in metropolitan population and land area over the same period. The horizontal axis measures the within-metropolitan SD in aggregate natural value using estimated hedonic weights as described in the text. The slope of the fitted line corresponds to the estimate in Table 6, Panel C, column (5).

Source: Lee and Lin, ReStud 2018

Implications for industry shocks and regional growth

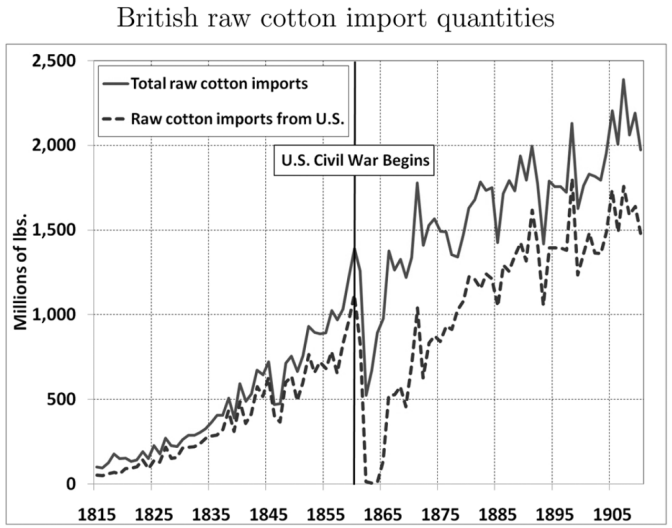
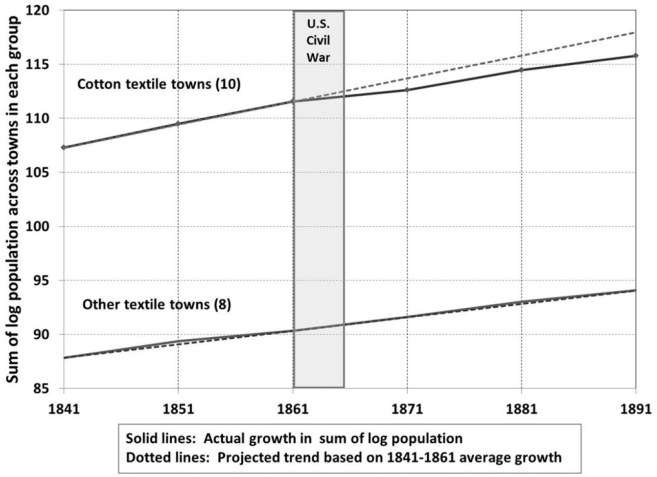


FIGURE 3.—POPULATION GROWTH IN COTTON AND OTHER TEXTILE CITIES



- Temporary fall in cotton imports to UK during US Civil War
- Cotton towns experienced temporary decline in population growth → permanent fall in population levels
- Can lead to regional re-organization of economic activity

Source: Hanlon, ReStat 2017

So, agglomeration forces matter and can lead to path dependence… but how quantitatively important are they?

- Allen and Donaldson (2021) offer an exciting new framework. They augment the Rosen-Roback model with historical spillovers

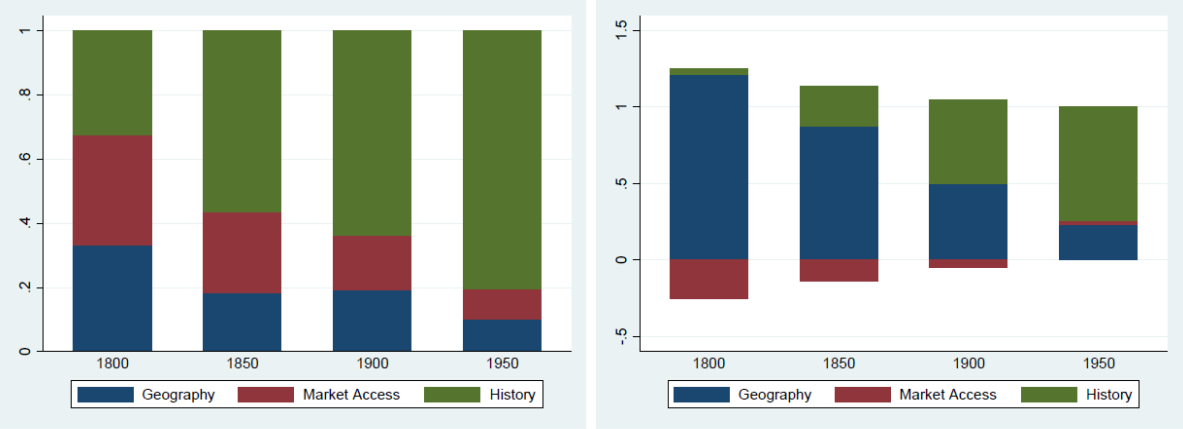
- Workers and firms choose locations based on productivity and amenities, which together determine wages and rents. Allen and Donaldson add costly migration between locations and overlapping generations

- Size of a location (population) determined by relative strength of agglomeration and dispersion. Possibility of path dependence/multiple steady states determined by *historical and contemporaneous* agglomeration forces

History has greater effect on local population size than on welfare (migration = safety valve)

Figure 4: How much of the spatial distribution of economic activity today is due to history?

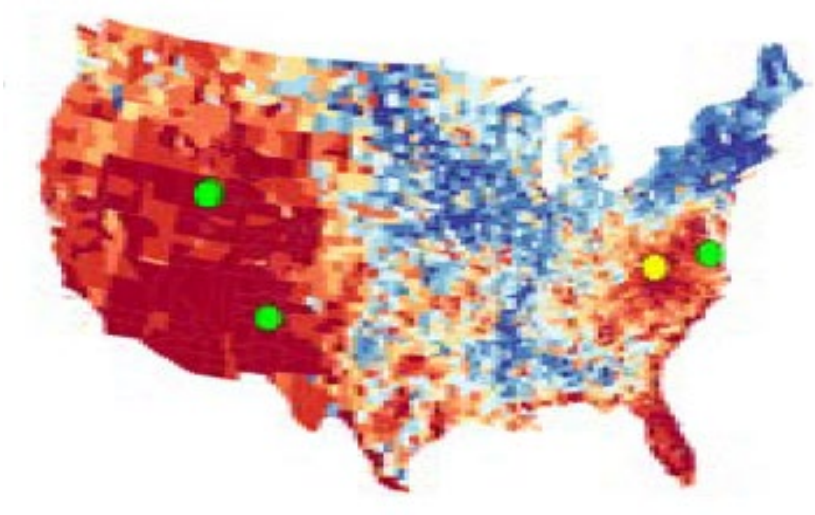
(a) Population ($L_{i,2000}$) (b) Ex-post welfare ($W_{i,2000}$)



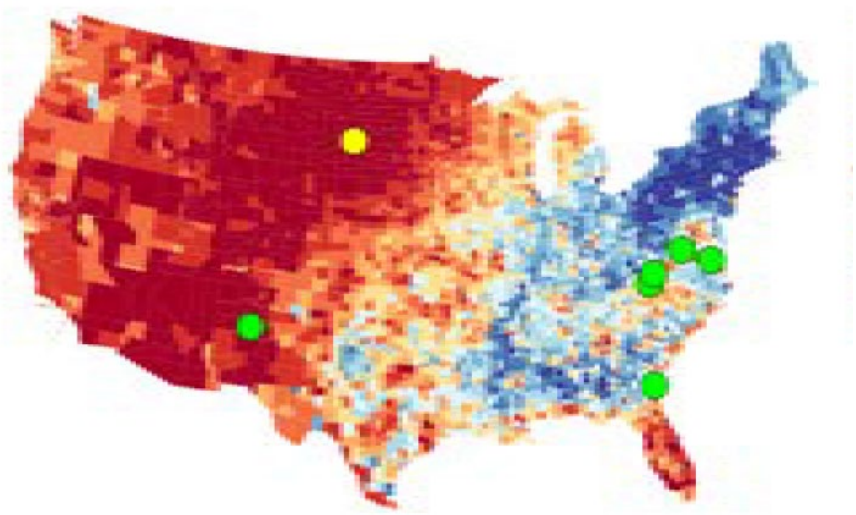
Notes: This figure presents the variance decomposition of the observed spatial distribution of economic activity in the year 2000 into three components, as per equation (33): geography fundamentals (i.e. the complete history of realizations of productivities $\bar{A}_{it}$ and amenities $\bar{u}_{it}$ from $t = 0$ until the present), market access (i.e. the complete history of goods market access P_{it} and labor market access Λ_{it} from $t = 0$ until the present), and history (i.e. the population distribution in $t = 0$, L_{i0}). The decompositions shown correspond to four choices of initial year $t = 0$: 1800, 1850, 1900, and 1950. Panel (a) presents the decomposition for

Of 100 simulations, 75 predicted more population in the West and less in New England/Mid Atlantic

(d) 26 simulations*



(f) 49 simulations*



- Red = More population than today; Blue = less population than today in 1,500 years
- Green and yellow dots = cities with >10 mil residents == Virginia, Albuquerque, Denver (!!)
- Did slavery and southern agriculture hold back the South? Role of communication/ transportation innovation and taste for good weather?

Infrastructure investments lower transport costs and may alter optimal location for economic activity

- Brief transport history: Canals → railroads → internal combustion/roads → air travel → shipping containers

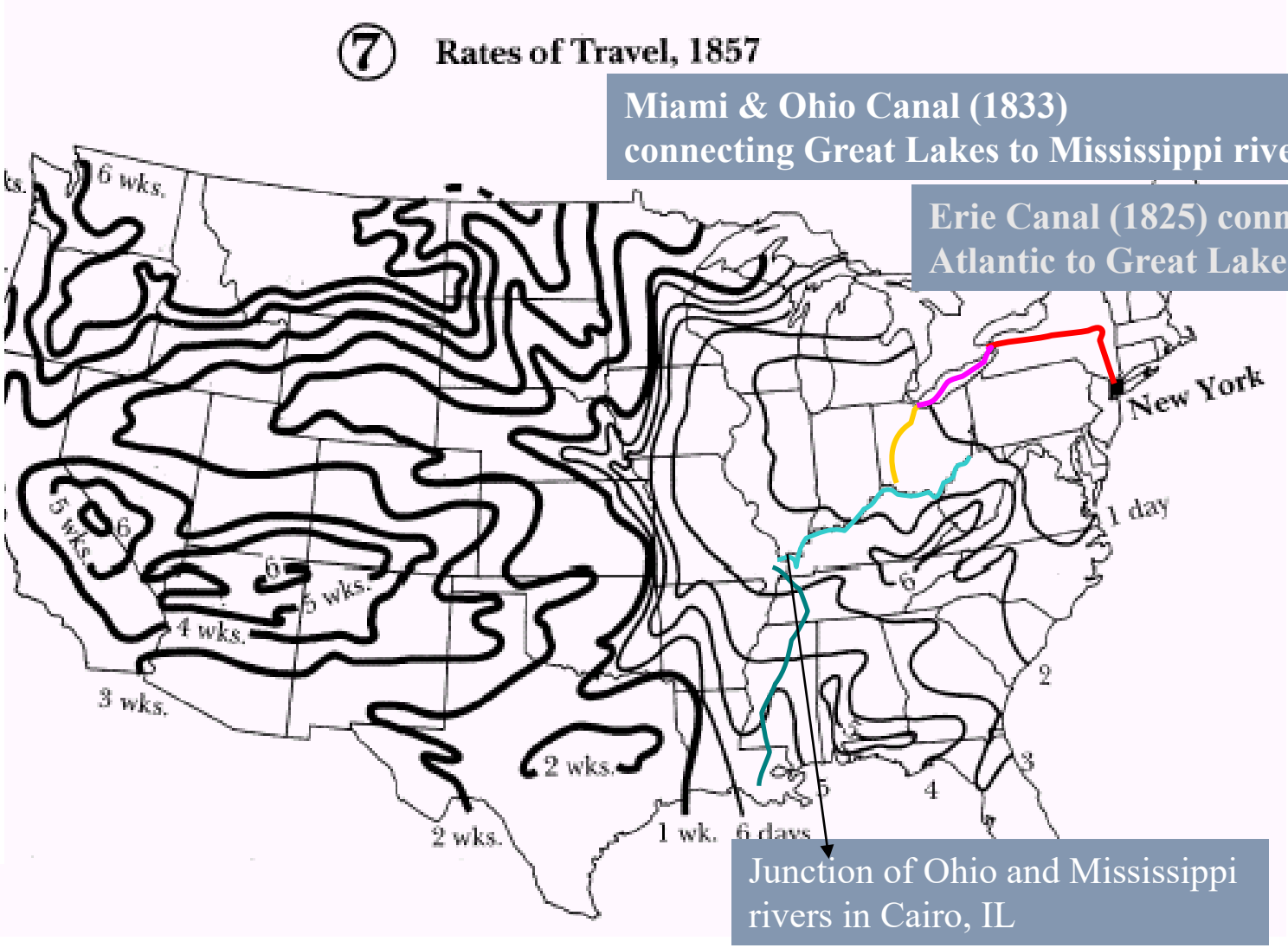
- Initial work of Robert Fogel: Was the railroad "indispensable"? No, other transportation options would have arisen in its absence (improved canals)

- New market access approach - Hornbeck and Donaldson for US history

- Also vast literature for history and developing countries – Donaldson, 2018 in India; Jedwab, et al., 2017 in Kenya; Faber, 2014 on Chinese highways; Hornung, 2015 in Prussia

Decline in travel time before the railroad

6 weeks



Miami & Ohio Canal (1833)
connecting Great Lakes to Mississippi river

Erie Canal (1825) connecting Atlantic to Great Lakes

Junction of Ohio and Mississippi rivers in Cairo, IL

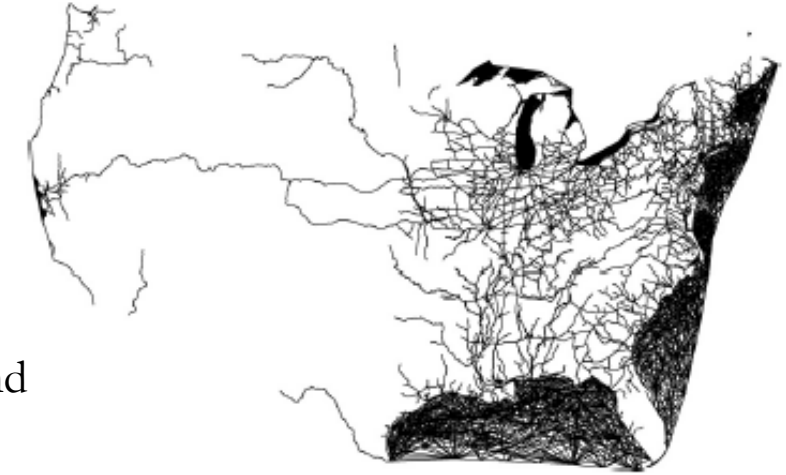
Railroad expansion between 1870 and 1890

Figure 2. Constructed Network Database (Partial)

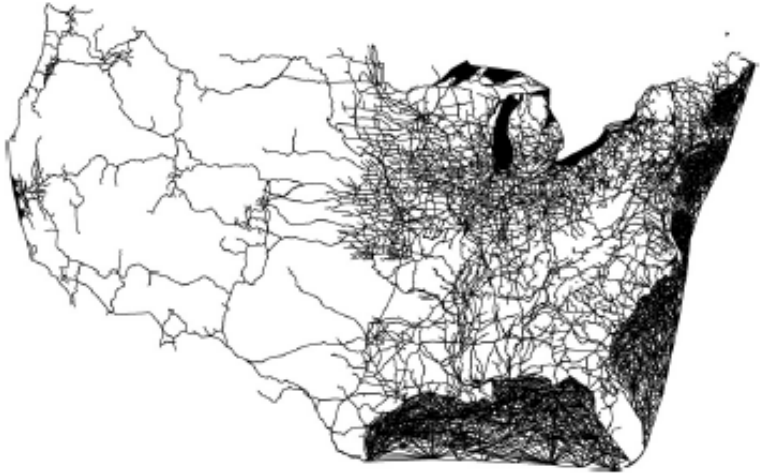
A. Natural Waterways

B. Natural Waterways and Canals

C. Natural Waterways, Canals, and 1870 Railroads



D. Natural Waterways, Canals, and 1890 Railroads



Source: Donaldson and Hornbeck, QJE 2016

A "market access" approach to valuing new infrastructure

- Hornbeck and Donaldson (2016) Reassess importance of railroads for economic outcomes using trade theory & new GIS data for transport network

- New rail connection in one location affects all areas. Measure change in market access:

$$MA_o = \Sigma_d \tau_{od}^{-\theta} N_d$$

Market access at origin is sum of market size (N = population) across all destinations d, weighted by trade costs (τ) … where $\theta>1$ captures variation in productivity or incentives to trade across places. Particular functional form comes out of trade model

- Follow Fogel in estimating trade costs τ using shipping rates and distances + a transshipment cost for changing modes. Even though rail more expensive than water routes, τ falls from 1870 to 1890 as railroad shortens distances and economizes on wagon transport

Aggregate effect of railroad on agricultural sector

- Outcome = log value agricultural land
- RHS variable = log market access controlling for county and state-by-year fixed effects
- Coefficient = 0.511; robust to using change in market access due to new RR outside county or buffer radius
- Counterfactual market access without railroad (from the model). Mean county would have experienced 80% reduction in MA without railroad!
- Without railroad, 60% reduction in agricultural land value ($5 billion) or 3.2% of 1890 GDP. Nearly identical to Fogel, but proposed canal extensions would have been poor substitute

Considering manufacturing sector; and adding distortions in inputs across space

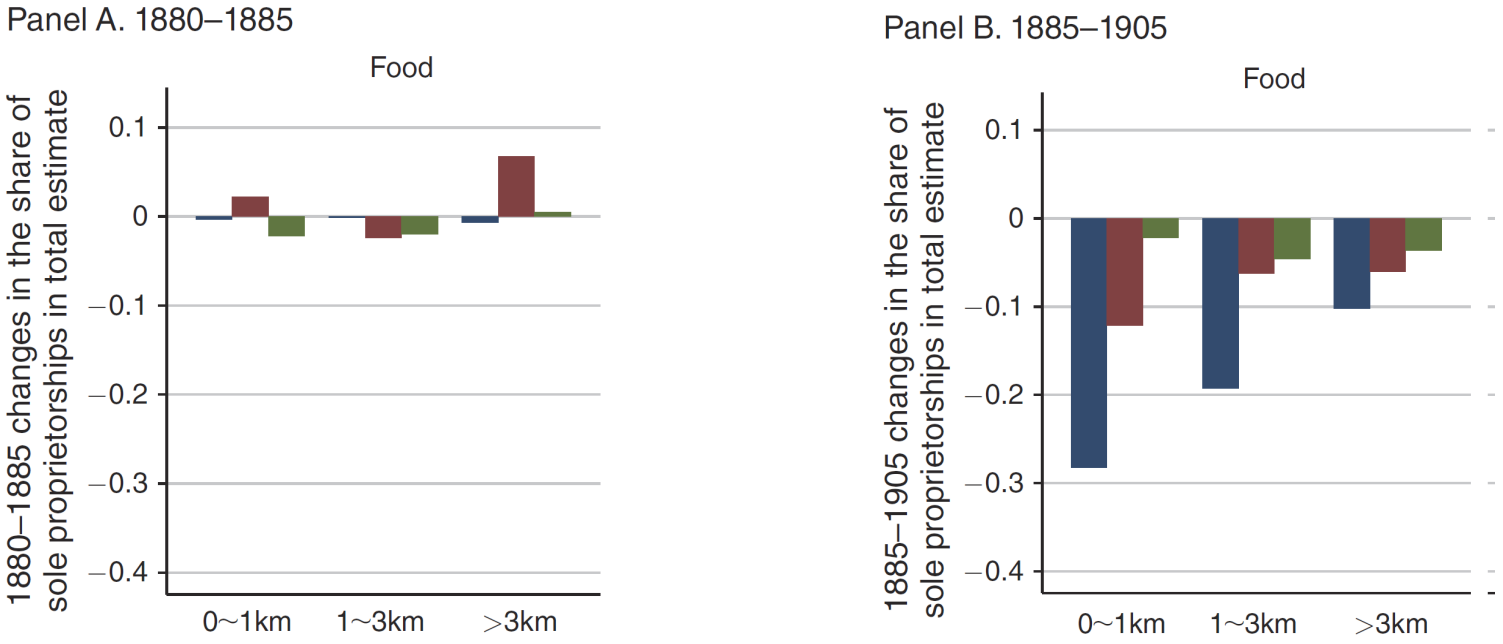
- Newly digitized county-by-industry data from Census of Manufactures on variables needed for production function
- Doubling of MA increases revenues by 20%, but also all inputs to similar degree, so little effect on TFP
- But large effect on "allocative efficiency" – after account for TFP gains, still a large residual. Implies that railroad allowed inputs to be allocated to locations that had inherently high marginal product of inputs (> costs) but some distortions had prevented activity before

	Baseline Specification (1)
Panel A. Log Revenue	
Log Market Access	0.192
	(0.049)
Panel B. Log Capital Expenditure	
Log Market Access	0.158
	(0.053)
Panel C. Log Labor Expenditure	
Log Market Access	0.196
	(0.061)
Panel D. Log Materials Expenditure	
Log Market Access	0.183
	(0.050)
Panel E. Log Productivity = Revenue - costs	
Log Market Access	0.204
	(0.051)
Number of Counties	1,802
County-Year Obs.	5,406

	Baseline Specification (1)
Panel A. Log County Productivity	
Log Market Access	0.204
	(0.051)
Panel B. County TFPR (Revenue Total Fa	
Log Market Access	0.036
	(0.025)
Panel C. County AE (Allocative Efficiency	
Log Market Access	0.168
	(0.051)
Number of Counties	1,802
County-Year Obs.	5,406

Source: Hornbeck and Rotemberg, WP 2021

Market access *within* cities – electrification of the street car and emergence of grocery stores



Notes: The horizontal axis represents the distances from the city center (City Hall).

- Electrification of existing horse-drawn street car lines in Boston, 1886-1905
- Digitize and geo-locate data from City Directories
- Decline in sole proprietorships in food stores, but not other retail
- Stronger effects close to city center, and in connected neighborhoods (e.g., Charlestown but not East Boston)

Source: You, AEJ 2021

Demand for transport services can increase endogenously alongside industrialization

- Nice structural model from Trew (2020) that makes this point in UK context
- Cost of transporting goods from a location is a function of past infrastructure stock but also labor allocated to distribution and new infrastructure investments
- Falling transport costs affects the optimal scale of production, so early infrastructure investments can have positive feedback on industrialization

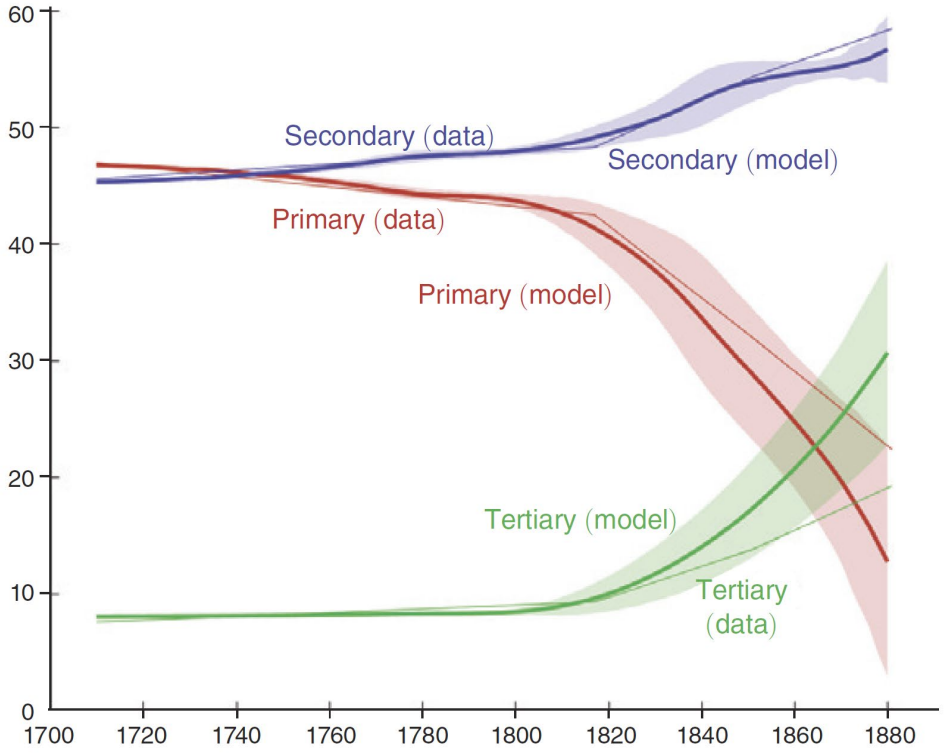


FIGURE 10. BASELINE SIMULATION: STRUCTURAL TRANSFORMATION (PERCENT LABOR SHARE)

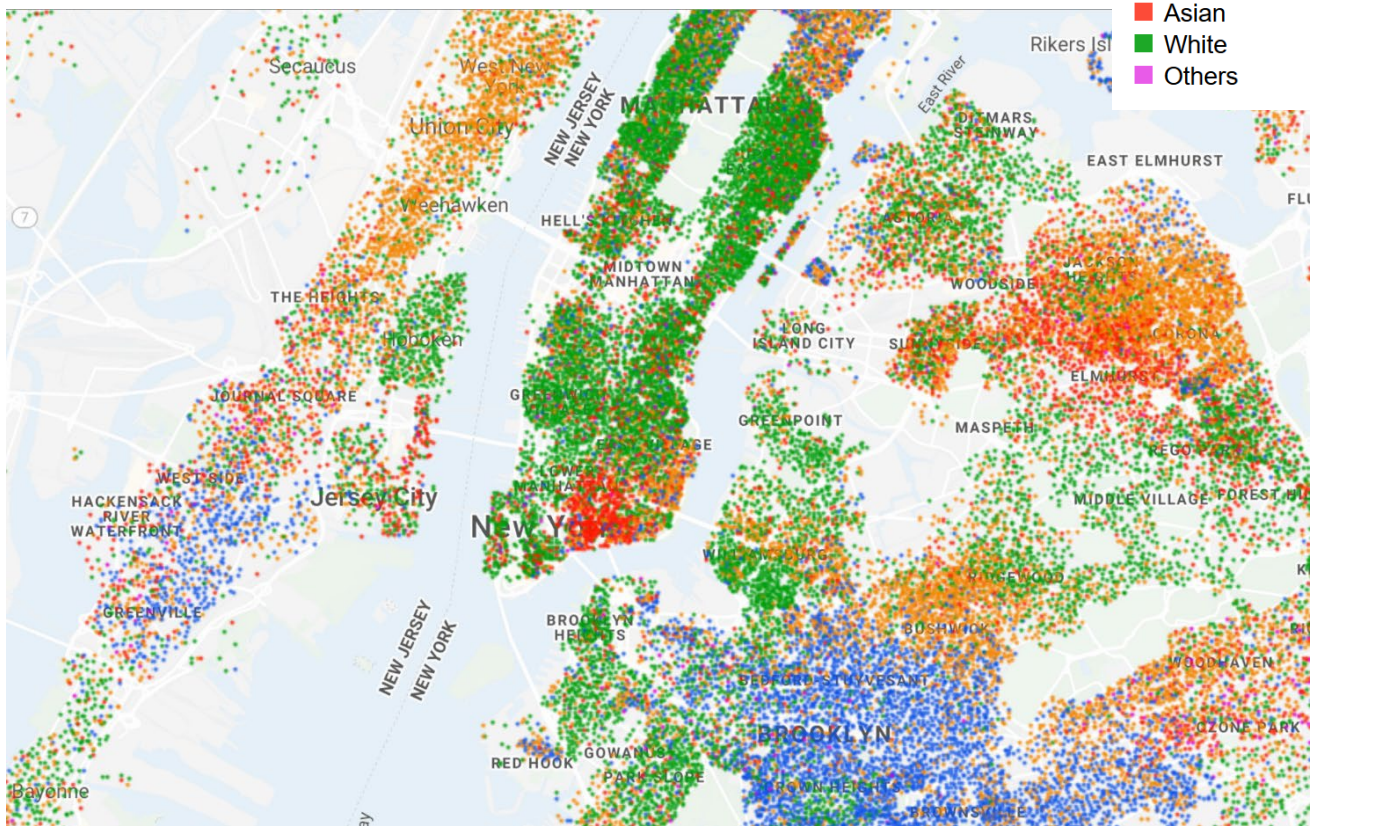
Source: Trew, AEJ 2020

Lecture 7 – Segregation within cities

Not all residents benefit equally from the concentration of economic activity in space

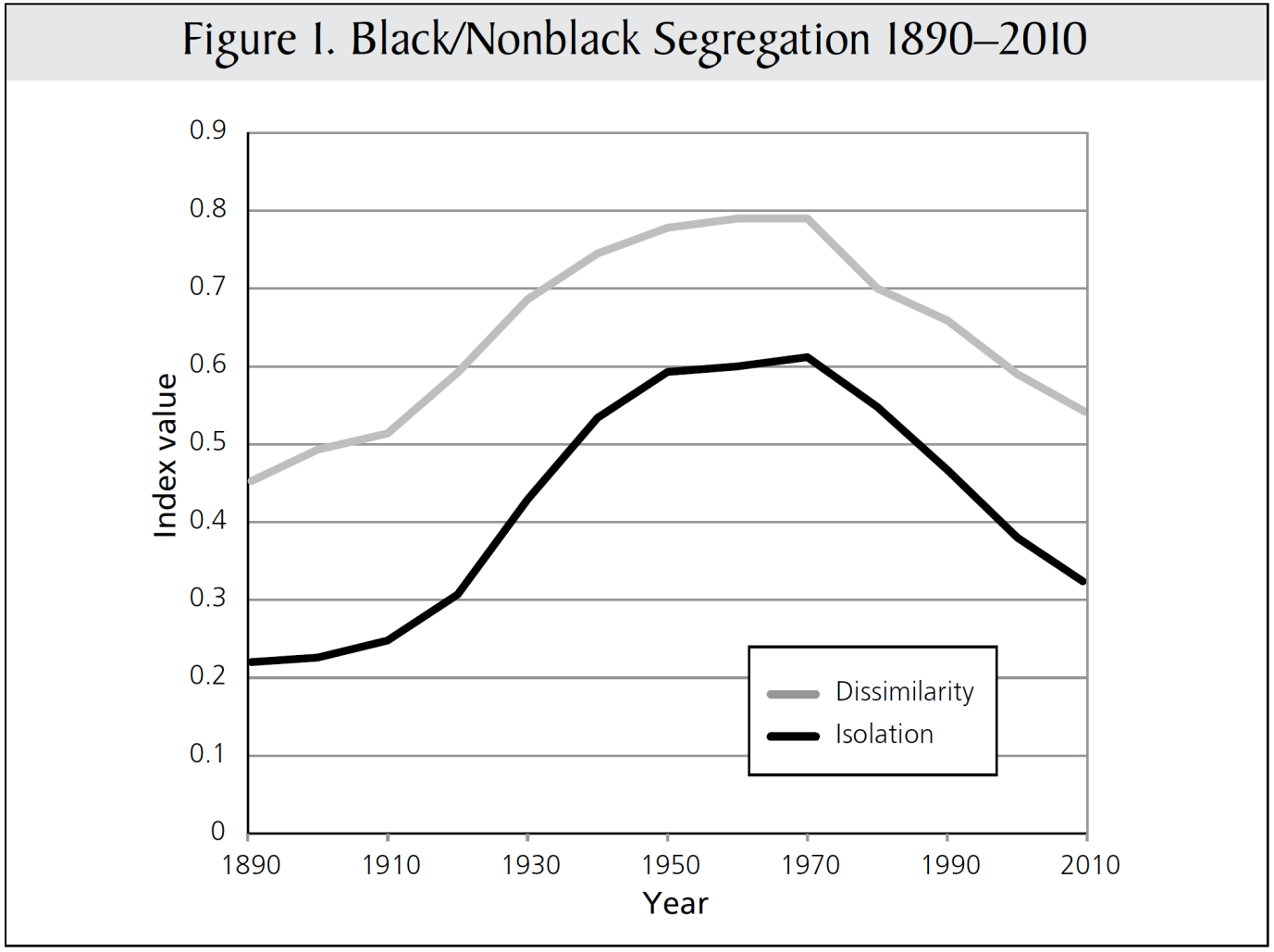
How is segregation maintained? What is the economic cost?

Are public health improvements that made city living more beneficial in the 20th century equally shared?



Source: *NYT*, 7/8/15

Black/non-black segregation over a century



Notes:

1. Housing market: CBSA (metro + micropolitan areas, unweighted)

2. Neighborhood: Wards from 1890-1940; Tracts from 1940-present

3. Groups: Non-black = white, Asian and many Hispanics & Native Am

4. Definition of dissimilarity and isolation indices

5. See Logan and Parman (2017) for next door neighbor measure of segregation (1880-1940)

Source: Glaeser and Vigdor (2012)

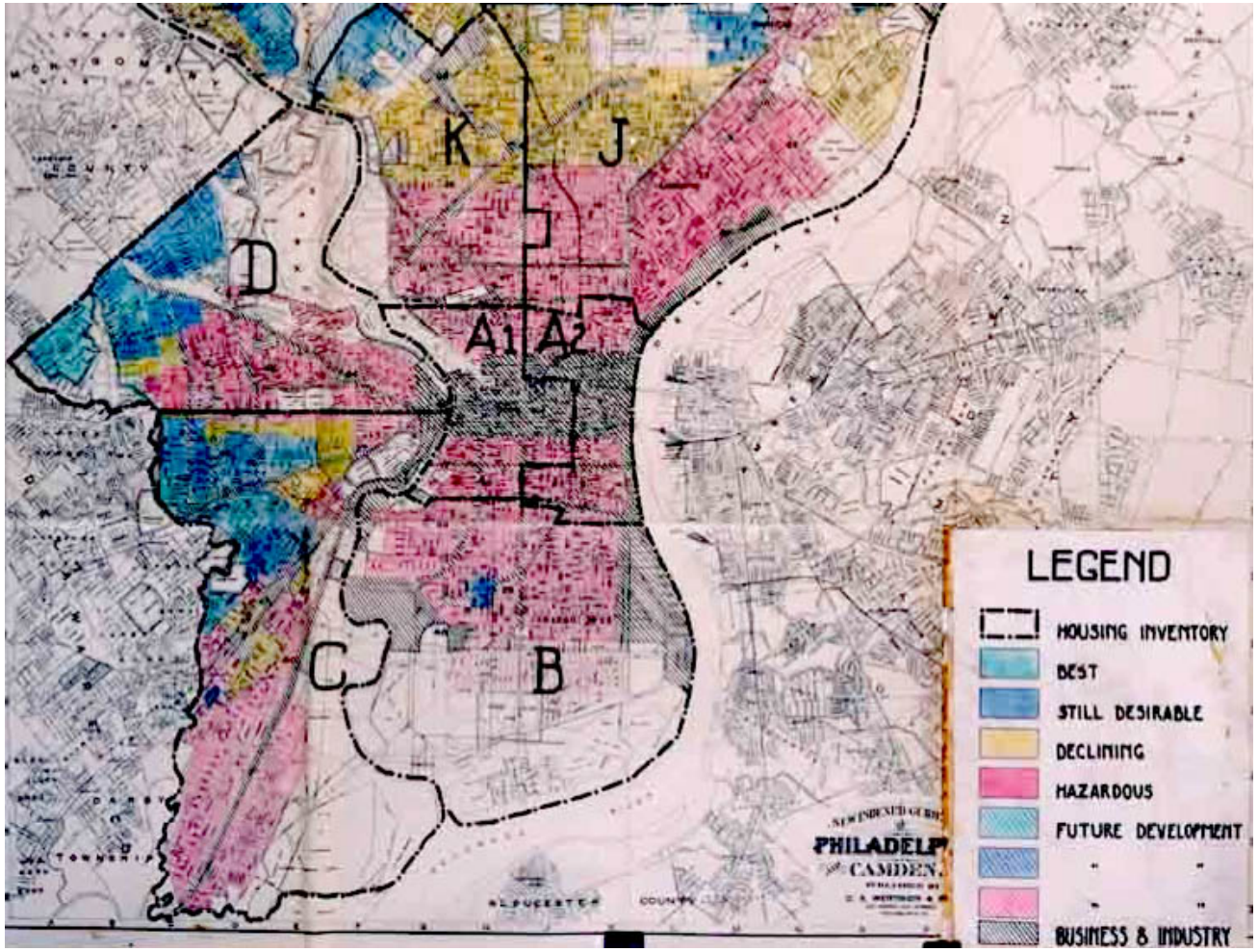
Explaining the rise of segregation
(see Cutler, Glaeser, Vigdor, 1999 for framework)

- Collective exclusion and policy efforts (partial list)
  - Restrictive covenants (Sood, et al. 2019)
  - Violence and intimidation
  - Differential access to credit
  - Urban renewal projects (Collins and Shester, 2013)

- Individual mobility (white flight)

- What about the decline?
  - Fair Housing Act of 1968 (Collins, 2004 studies earlier state laws)
  - Community Reinvestment Act of 1977 (for history: Taylor 2019)
  - Demolition of public housing sites (Chyn, 2018)

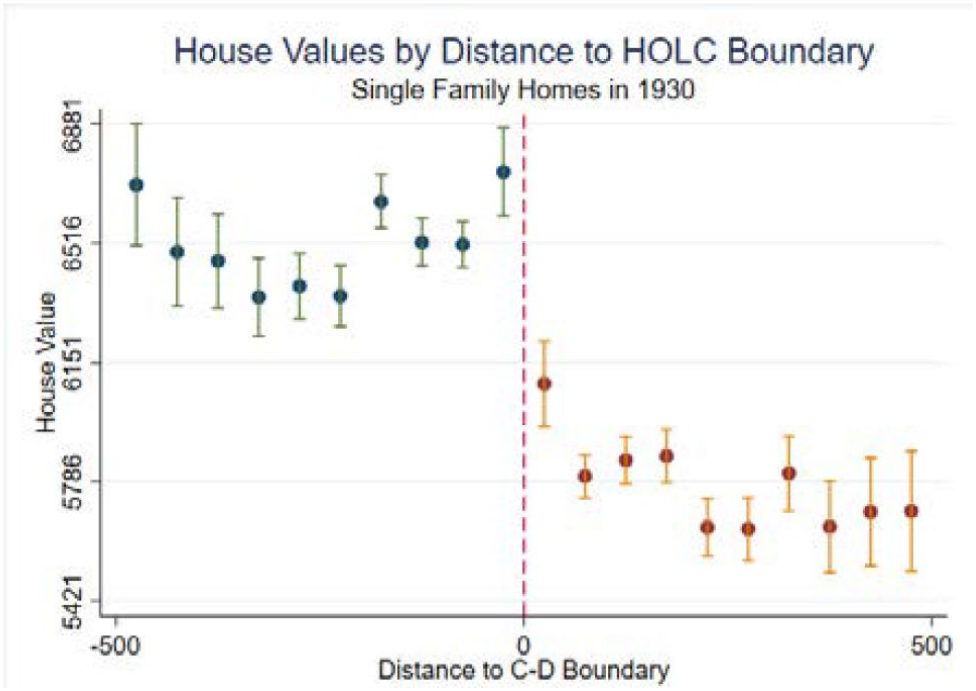
Collective exclusion via access to credit

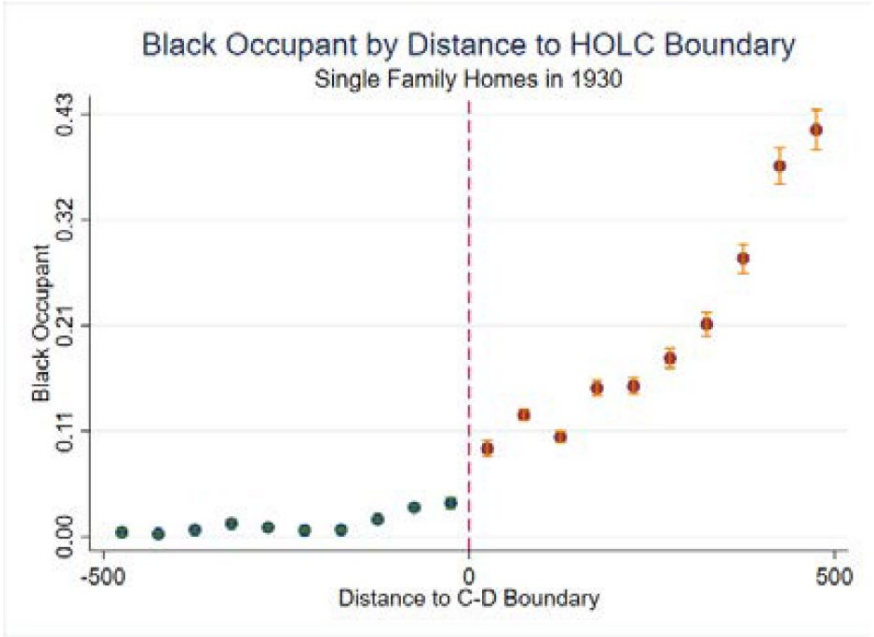


Home Owners Loan Corporation: Established in 1933 to purchase troubled mortgages from lenders. Maps based on housing and demographic attributes of n'hoods ("redlining"). Later used by FHA?

Were HOLC loans an independent force of exclusion or just documenting existing perceptions of risk?

Gaps in attributes in 1930 (before maps)





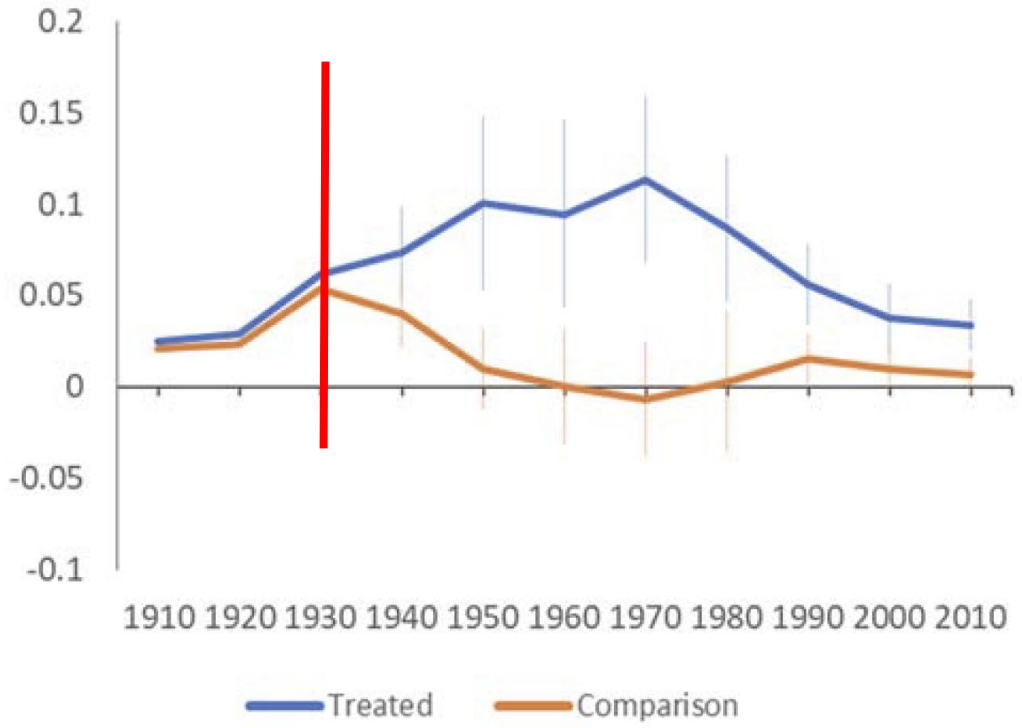
Panel D: Racial Composition

Source: Fishback et al., NBER WP 2021

Yet HOLC maps *may* contribute to changes in segregation

Figure 5: Main Effects along D-C Boundaries

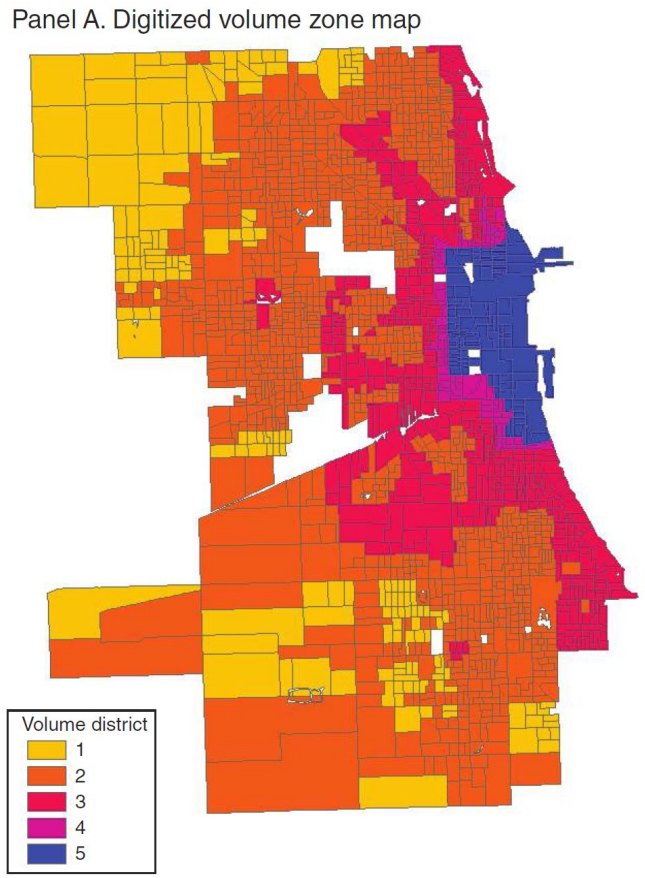
Panel A: Share African American



- Start with blocks ¼ mile away from a red vs. yellow boundary (**blue**)
- Notice that gap in % black already exists and grows from 1920-30 (before maps)
- Add comparison (**orange**): Propensity score suggests these areas *should* divide red vs. yellow
- Difference between actual vs. placebo in % black after 1930
- Mechanism: Blacks have fewer outside options

Source: Aaronson, Hartley, Mazumder, WP 2019

Zoning and land use is another potential source of neighborhood disparities



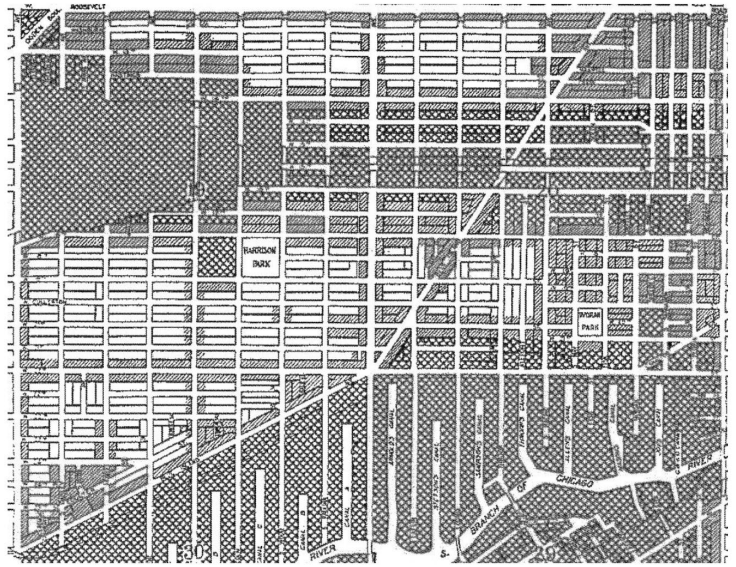


FIGURE 5. ZONING MAPS

Notes: Panel A: This map shows volume districts in the Chicago zoning ordinance with enumeration districts assigned to the volume district in which the majority of its area fell. District 5 permitted the tallest buildings, up to 22 stories. District 1 was the most restrictive, allowing only buildings with three or fewer stories. Panel B: This image shows the area of Chicago west of the downtown along the Chicago River. Unhatched areas are zoned for apartments, hatched areas are zoned for commercial uses, and cross-hatched areas are zoned for manufacturing.

- Detailed maps from Chicago's first zoning law in 1923 coupled with Census data from 1920 on residents by enumeration district

Source: Shertzer, Twinam and Walsh, AEJ 2016

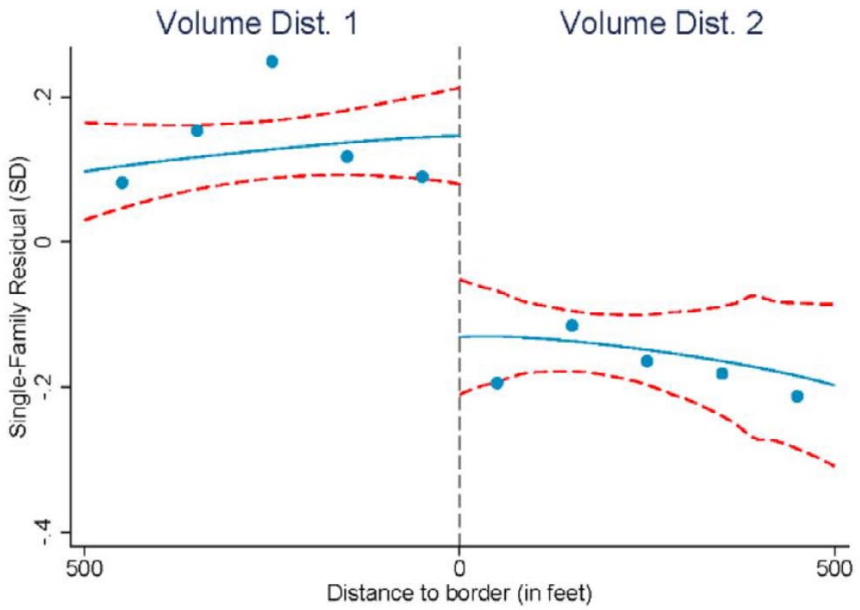
Black neighborhoods more likely to be zoned at high density

TABLE 3—EFFECT OF MINORITY SHARE ON VOLUME ZONIN

In standard deviations

	Indicator for receivi for high	
	(3)	(4)
Total black percent share	0.268	
	(0.0964)	
Southern black share		0.294
		(0.198)
Northern black share		0.00344
		(0.166)
First-gen. immigrant share	−0.0585	−0.0592
	(0.0898)	(0.0900)
Second-gen. immigrant share	0.0826	0.0817
	(0.0586)	(0.0588)
1913 land values	5.046	5.035
	(0.757)	(0.758)
Diff. between black and first-gen. effect (p-value)	0.001	
Diff. between south. black and first-gen. effect (p-value)		0.093
R^2	0.525	0.525
Controls	Yes	Yes
Observations	395	395

Source: Shertzer, Twinam and Walsh, 2016, JUE 2018



- Compare districts within 1000 feet of boundary between volume 1 and 2 zones (vol 1 = up to 3 stories, vol 2 = up to 8 stories)
- Zones from 1923 still have effect on % single family dwellings today!

White flight from central cities, 1940-70

TABLE II
BLACK MIGRATION TO CENTRAL CITIES AND WHITE POPULATION LOSS

Dependent variable:	Actual black population in city	White population in city	
Instrument type	First stage	OLS	IV
Assign actual migrants	4.442	−2.099	−2.365
	(0.652)	(0.549)	(0.805)
Assign predicted migrants, 1940–1970	3.466	−2.099	−2.627
	(0.671)	(0.549)	(0.782)

$$\text{W\_CITY}_{mrt} = \alpha_m + \beta_1(\text{B\_CITY}_{mrt}) + \gamma_1(\text{POP\_METRO}_{mrt}) + \upsilon_{rt} + \varepsilon_{mrt}, \quad (5)$$

Source: Boustan, QJE 2010

White flight at neighborhood level: 1900-1930

Table 2. Baseline OLS and IV Results for Effect of Black Arrivals on White Departures

	dependent variable = change in white population		
	1900-1910 Decade	1910-1920 Decade	1920-1930 Decade
OLS Results			
Change in Black Population	0.189	-0.908***	-1.492***
	(0.264)	(0.122)	(0.075)
R-squared	0.088	0.139	0.258
IV Results			
Change in Black Population	-0.936	-1.886***	-3.389***
LIML Standard Errors	(0.577)	(0.227)	(0.246)
Conley GMM Spatial Standard Errors	(0.719)	(0.238)	(0.386)
Change in Black Population: Spatial Subsample	-0.871	-1.956***	-3.550***
Bootstrapped Standard Errors	(1.178)	(0.368)	(0.805)
First Stage			
Predicted Change in Black Pop.	0.918***	0.732***	0.878***
	(0.040)	(0.025)	(0.053)
F-test on First Stage	520.2	829.0	275.9
Observations	1,975	1,975	1,975

Notes: See Table 1 for sample and variable details. All regressions include city fixed effects. The instrumental variables regressions are estimated using limited information maximum likelihood estimation (LIML). The Conley (1999) spatial standard errors are estimated using GMM. The spatial subsample standard errors are generated using 25 percent spatially independent subsamples bootstrapped 100 times.

Source: Shertzer and Walsh, ReStat 2019

White flight and local public goods

- Many city neighborhoods remained ~100% white after black migration

- Role of city-wide public goods?
  - Ideal experiment = similar neighborhoods in jurisdiction with high/low %black
  - Can use border between cities/suburbs (Boustan 2013, following Black, 1999, etc.)

- Desegregation of urban public schools in 1970s
  - City districts were held responsible for *de facto* segregation, but most suburbs exempted
  - Key Supreme Court decisions: 1973 *Keyes v. Denver*; 1974 *Miliken v. Bradley*

Housing prices fall on city side of border after desegregation, suggests departures from city

Table 5: School desegregation and relative city housing prices at the district border, 1960-80

Dependent variable = ln(housing value)

	Placed under court-order during 1970s	Not placed under court-order during 1970s	Difference
1970	-0.047	-0.026	-0.021
	(0.014)	(0.015)	(0.020)
1980	-0.097	-0.023	-0.073
	(0.028)	(0.022)	(0.035)
Δ 1970-1980	-0.065	-0.007	-0.058
	(0.024)	(0.015)	(0.028)
Pre-trend:			
Δ 1960-1970	-0.023	-0.022	-0.001
	(0.013)	(0.017)	(0.022)

Source: Boustan, AEJ 2012

Segregation associated with poor outcomes for black residents

• Cutler and Glaeser (1997): Black residents of segregated metro areas earn less. But why are some areas more segregated than others?

• Ananat (2011) Railroads as "segregation technology" that divided some cities into well-defined neighborhoods, facilitating segregation

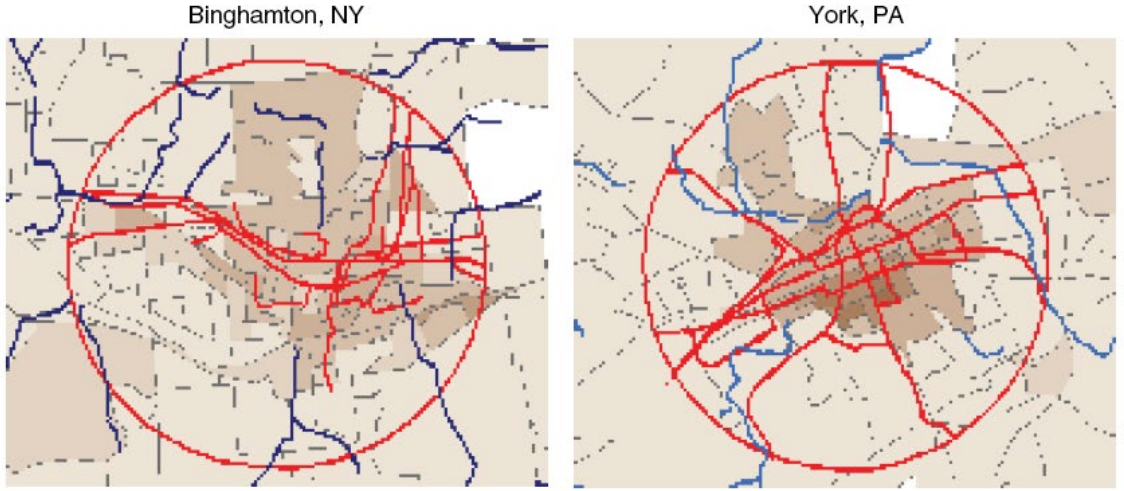


FIGURE 1. THE NATURAL EXPERIMENT—2 EXAMPLES

Segregation raises black poverty rate using railroad division as instrument

TABLE 2—THE EFFECTS OF SEGREGATION ON POVERTY AND INEQUALITY AMONG BLACKS AND WHITES

	OLS: Effect of 1990 dissimilarity index		Main results: 2SLS RDI as instrument for 1990 dissimilarity		Falsification: Reduced form effect of RDI among cities far from the south	
Outcome:	Whites (1)	Blacks (2)	Whites (3)	Blacks (4)	Whites (5)	Blacks (6)
Within-race poverty and inequality						
Gini index	**−0.079**	**0.459**	**−0.334**	**0.875**	−0.110	0.167
	(0.037)	**(0.093)**	**(0.099)**	**(0.409)**	(0.066)	(0.424)
Poverty rate	**−0.073**	**0.182**	**−0.196**	**0.258**	−0.036	−0.136
	(0.019)	**(0.045)**	**(0.065)**	**(0.108)**	(0.035)	(0.094)

Source: Ananat, AEJ 2011

Great Migration associated with segregation and lower mobility rates – especially for black men

FIGURE 6: GREAT MIGRATION REDUCED AVERAGE UPWARD MOBILITY IN NORTHERN COMMUTING ZONES

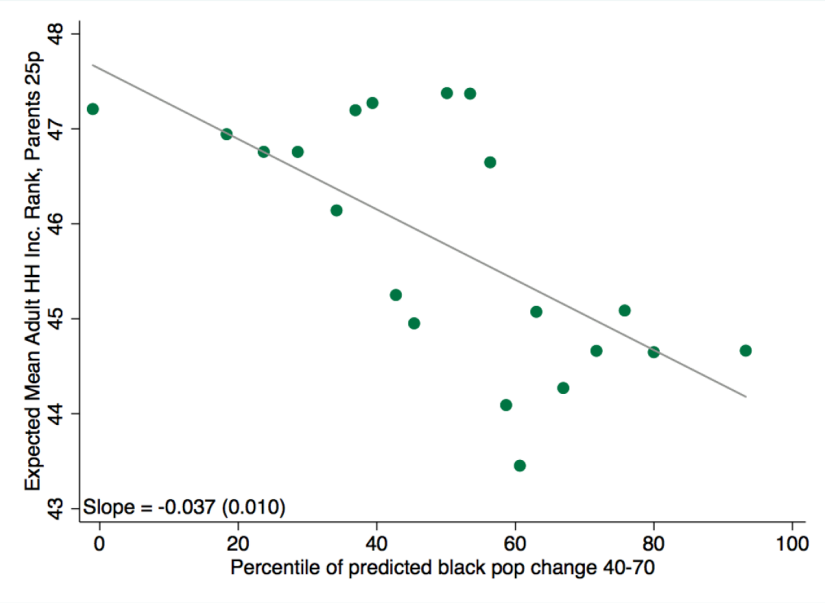
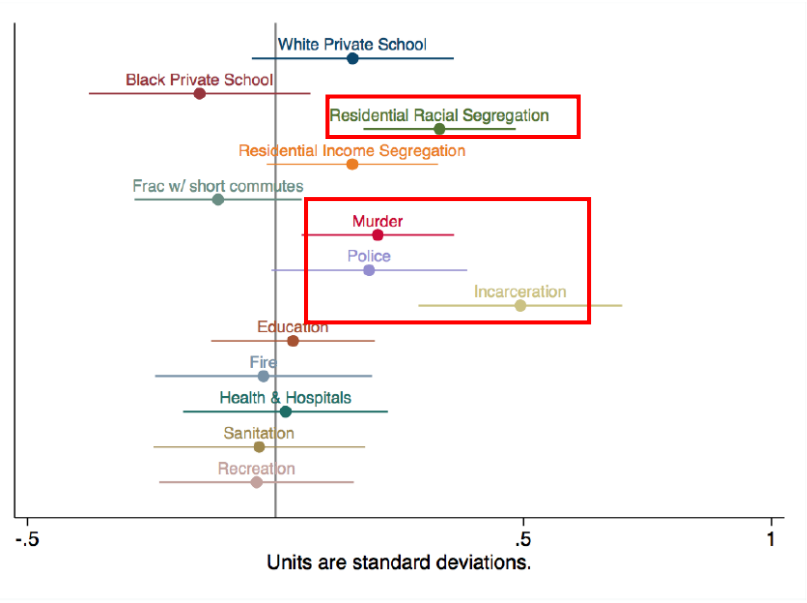


FIGURE 9: INCREASED SEGREGATION, CRIME, POLICING, AND INCARCERATION IN GREAT MIGRATION CZS



Notes: This figure plots the coefficient on the instrument for black population increases during the Great Migration, in approximately one standard deviation units, in separate regressions. The dependent variables are standardized mean 1970-2000 white and black private school enrollment rates; the Theil indices in res-

Source: Derenoncourt, AER forthcoming

Public health for all?

- Because of residential segregation (by race, by income), are amenity and productivity advantages of living in cities shared by everyone?

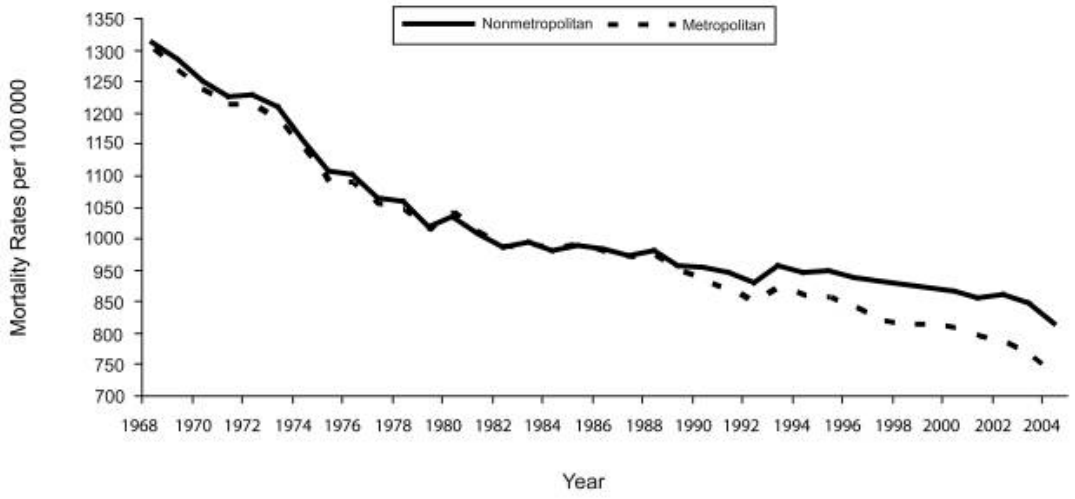
- We have already seen that segregation is associated for poorer outcomes for black residents of cities

- What happens when a new investment improves well-being in cities… is it shared by all?

Cities were deadly in early 20th century; converged with rural areas by 1960s

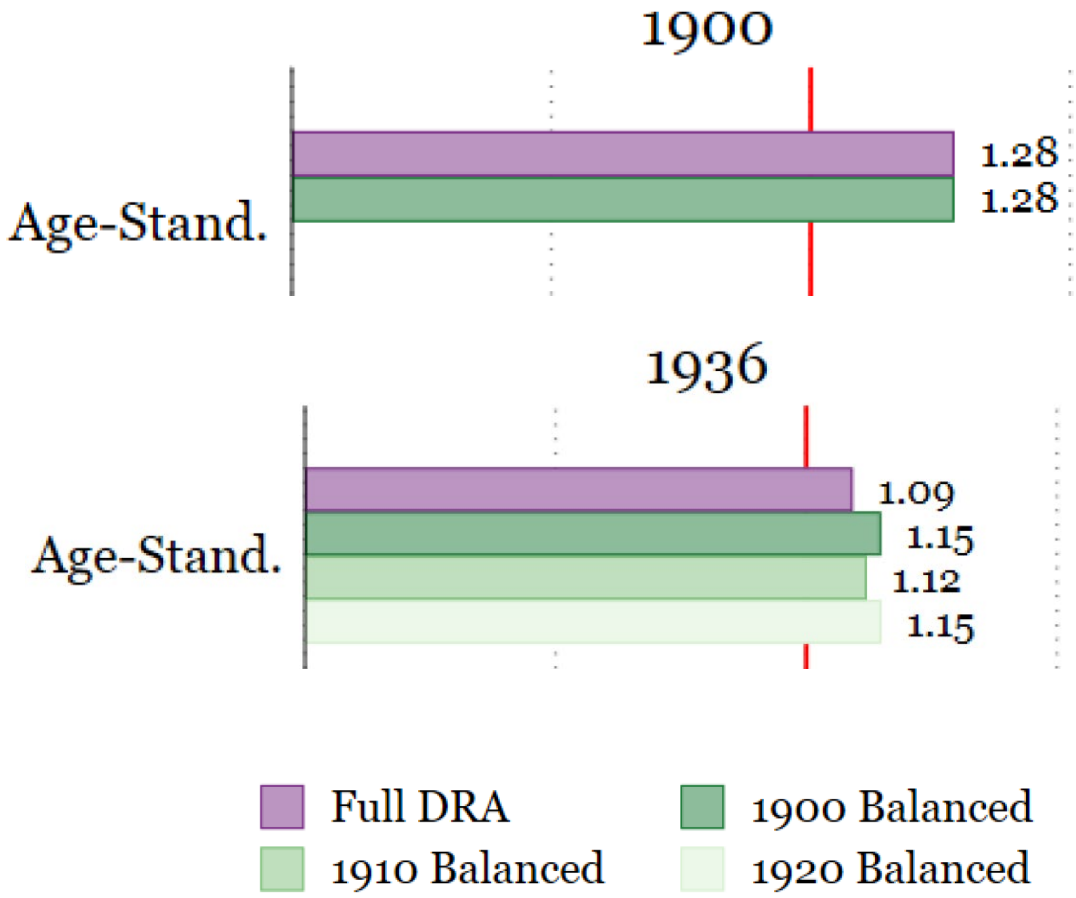
Annual death rates per 1,000 c. 1900

	Total death rates			Infant death rates (under 1 year)		
	Rural	Urban	Ratio urban/ rural	Rural	Urban	Ratio urban/ rural
				1890—Data unadjusted for underregistration		
Massachusetts	17·0	20·1	1·18	130·0	227·6	1·75
New Hampshire	17·9	18·8	1·05	140·1	222·2	1·59
New Jersey	15·4	23·3	1·51	149·7	263·3	1·76
New York	13·7	23·3	1·70	99·5	249·5	2·51
Rhode Island	20·3	21·4	1·05	202·6	226·8	1·12
Vermont	15·7	17·6	1·12	101·5	211·7	2·09



Source: Condran and Crimmins, 1980; Cosby, et al. 2008

Urban mortality penalty diminished (but did not disappear!) in 1920s

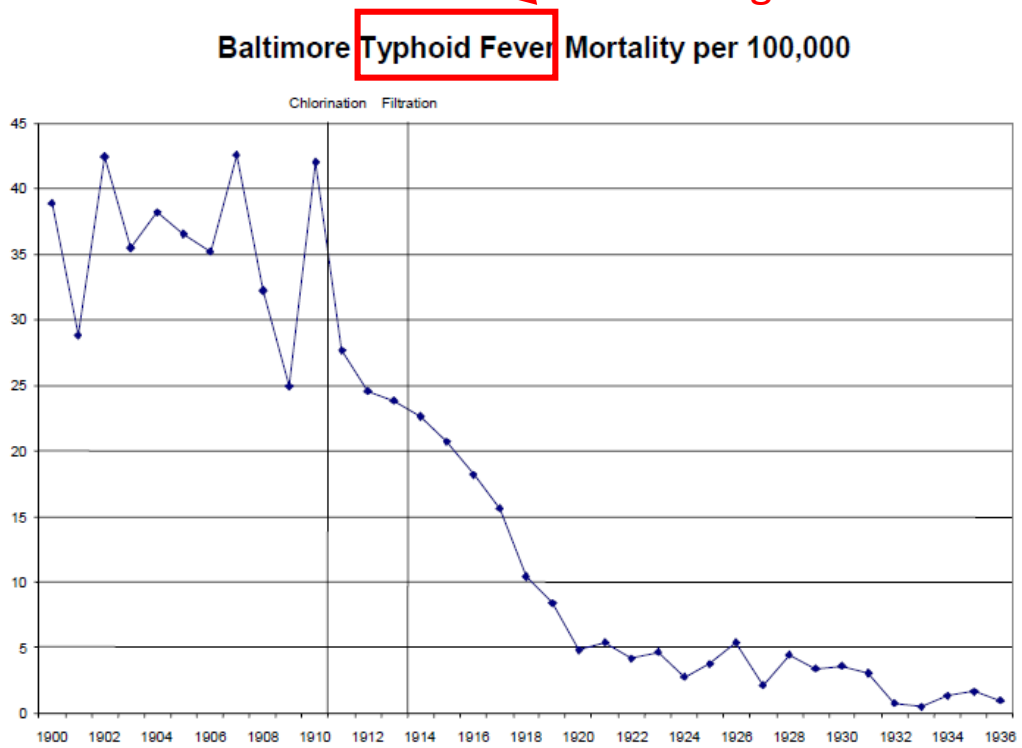


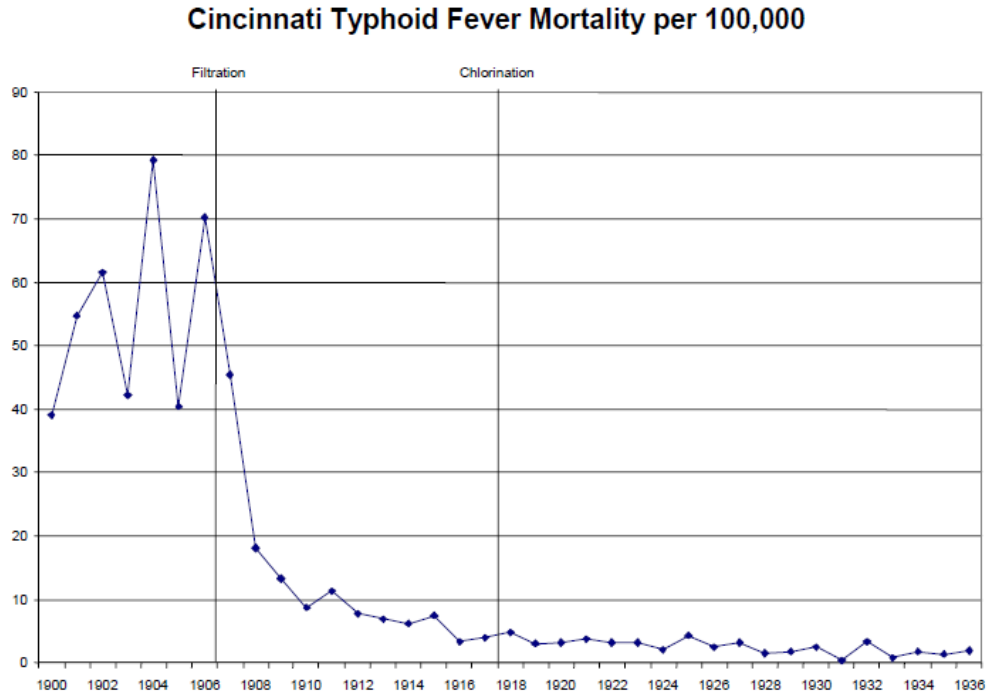
Source: Feigenbaum, Hoehn-Velasco, Wrigley-Field, WP 2020

Causal effect of public health investments

Start with 13 cities before/after water chlorination or filtration

Striking effects for water-born diseases





Estimate = ~15% reduction in total mortality in years following water filtration

Source: Cutler and Miller, Demography 2005

Was clean water a good investment?
(Based on Cutler and Miller estimates)

	Point Estimate
% Mortality Reduction Due to Clean Water	0.1326
1915 Mortality Reduction per 100,000 Population	208
1915 Deaths Averted	1,484
1915 Life Years Saved	57,922
1915 Annual Benefits in Millions of 2003 Dollars	$679
1915 Annual Costs in Millions of 2003 Dollars	$29
SOCIAL RATE OF RETURN	23:1
COST PER LIFE YEAR SAVED IN 2003 DOLLARS	$500

Assumes value of $10k per person per year

A great example of re-examining an important question

Table 11. Comparing our Total Mortality Estimates to those of Cutler and Miller (2005)

	(1)	(2)	(3)	(4)	(5)
	Replicating C&M's original estimates	Column (1) + clustered standard errors	Column (2) + Memphis, TN correction	Column (3) + consistent population estimates used to calculate mortality rates	Column (4) + corrected filtration and chlorination dates
Filtration	-.162***	-.162**	-.134**	-.081**	-.043
	(.036)	(.064)	(.053)	(.028)	(.034)
		{.059}	{.019}	{.034}	{.293}
Chlorination	-.017	-.017	-.010	-.039	-.049*
	(.025)	(.034)	(.024)	(.026)	(.026)
		{.621}	{.671}	{.215}	{.096}
*Filtration*Chlorination*	.047**	.047	.032	.054**	.043
	(.022)	(.031)	(.025)	(.024)	(.025)
		{.154}	{.215}	{.071}	{.127}
Years	1905-1936	1905-1936	1905-1936	1905-1936	1905-1936
Mean of total mortality rate	1,504	1,504	1,498	1,494	1,494
N	415	415	410	410	410
R^2	.957	.957	.963	.970	.969

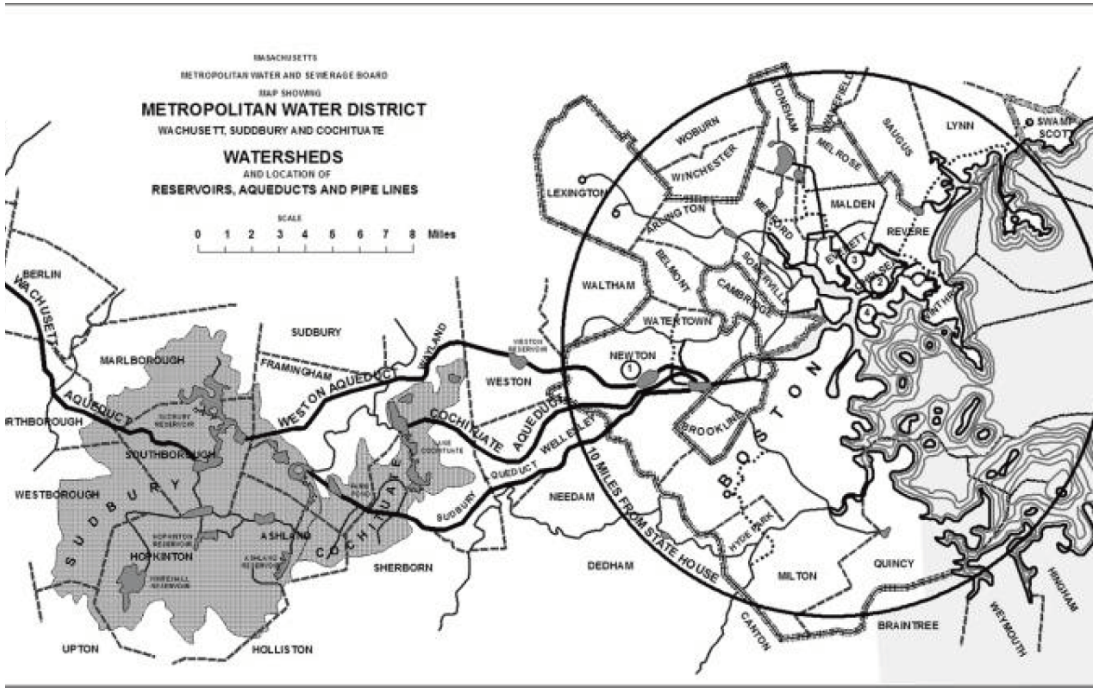
*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

- Expanded sample to 25 cities
- Found limited effect of clean water on adult mortality
- Worked to systematically explain differences in estimates
- Lower role of clean water in falling adult mortality; some role for *infant* mortality
- Note that falling infant mortality is crucial for end of urban penalty…

Source: Anderson, Charles and Rees, AEJ 2020

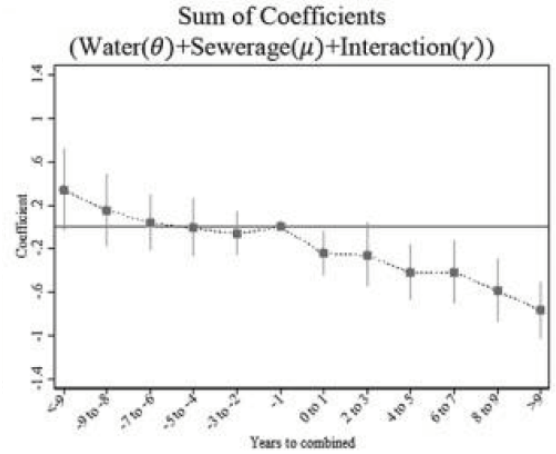
Why do some cities invest in sewerage and clean water before others?

- In 1886, towns within a 10 mile radius of Boston were compelled to join a metropolitan sewerage district to prevent downstream pollution
- Expect towns inside the district to undergo larger declines in infant mortality after 1886, relative to towns outside of the district
- Benefit of research design: Towns do not have a choice about whether to join or when

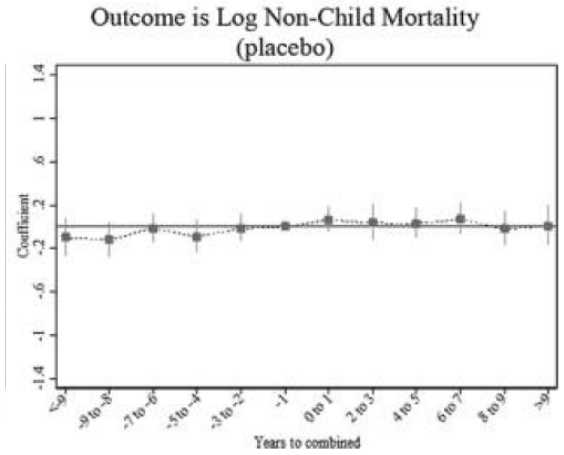


Source: Goldin and Alsan, JPE 2019

Infant mortality rates in treated towns relative to comparison (again, no effect on adults)



Infant mortality



Adult mortality

Forgotten cause of urban mortality penalty: Air pollution

- Modern environmental literature focused on health costs of air pollution. What about in the past?
- No data on historical pollution, but can use industrial structure of 580 districts in UK and coal use per worker for each industry as proxy
- Industrial structure may affect health in other ways, so authors consider upwind/downwind cities
- Explains 1/3 of urban mortality penalty for infants

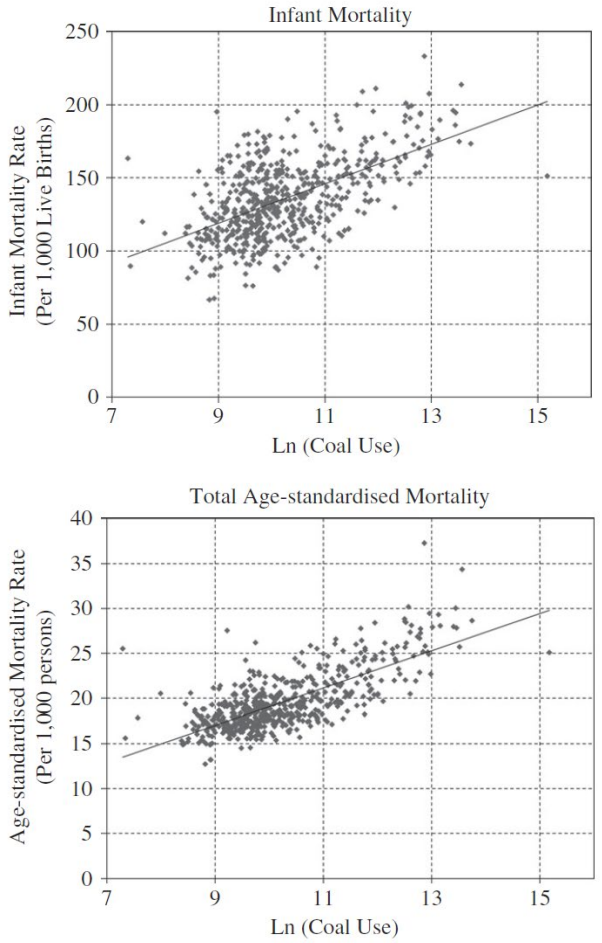


Fig. 2. *Coal Use and Mortality in England and Wales in 1851–60*
Notes. Local industrial coal use is based on the industrial composition of districts in 1851. The mortality rates are calculated using data from 1851 to 1860.

Source: Beach and Hanlon, EJ 2018

Next steps: Pollution, access to clean water, density across neighborhoods. Heterogeneity in mortality rates in Paris

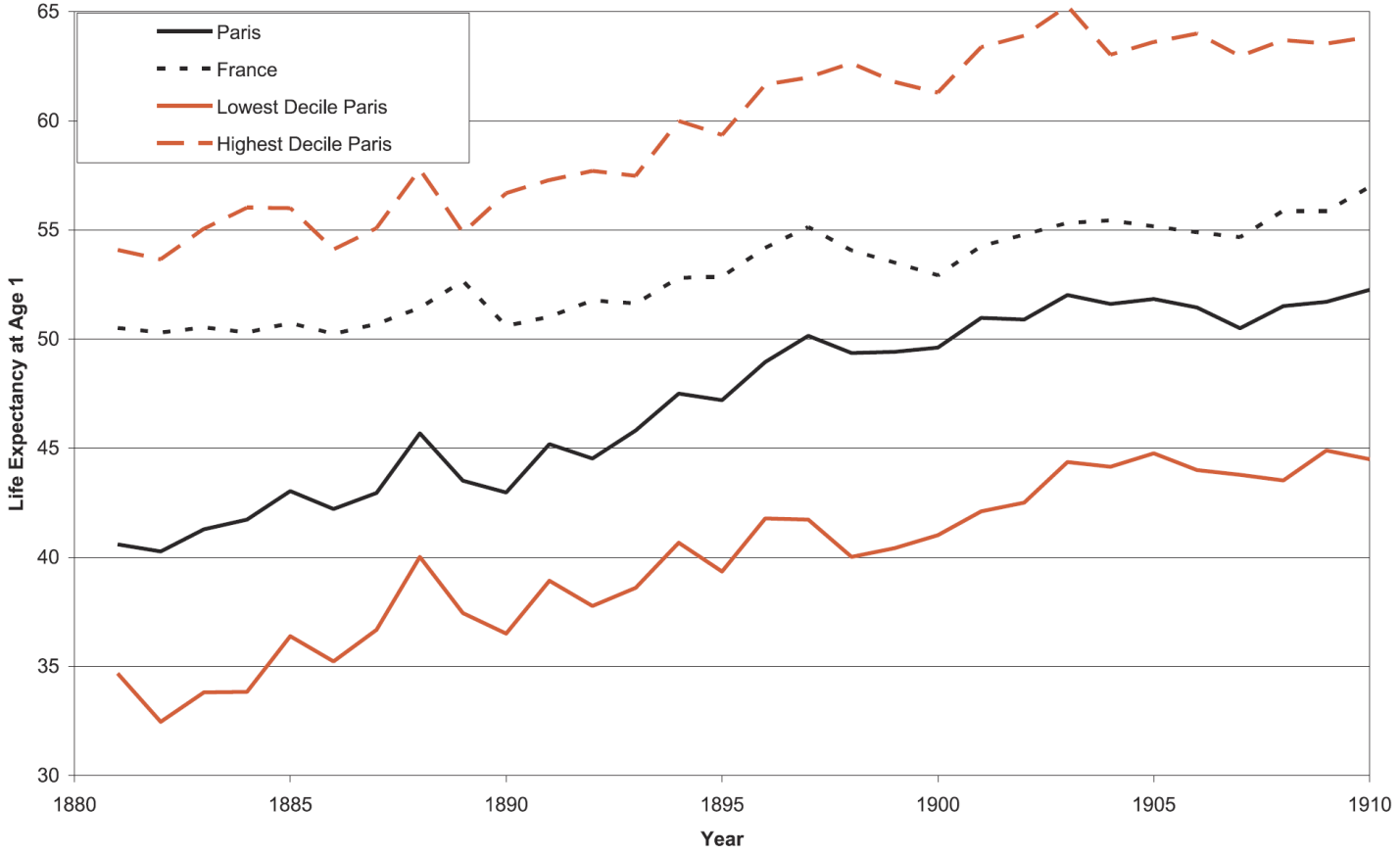


Fig. 2. Life expectancy at age 1 within Paris, compared to France. (For interpretation of the references to color in this figure, the reader is referred to the web version of this article.)

Source: Kesztenbaum and Rosenthal, JUE 2017

Local public health associated with local health improvements

- Substantial variation in sewer hookups by neighborhood – not the case that all residents of a city benefit equally

- Using neighborhood and time fixed effects, authors find that complete hook-up is associated with 1 additional year of life expectancy at age 1 (even controlling for rents as proxy for income composition)

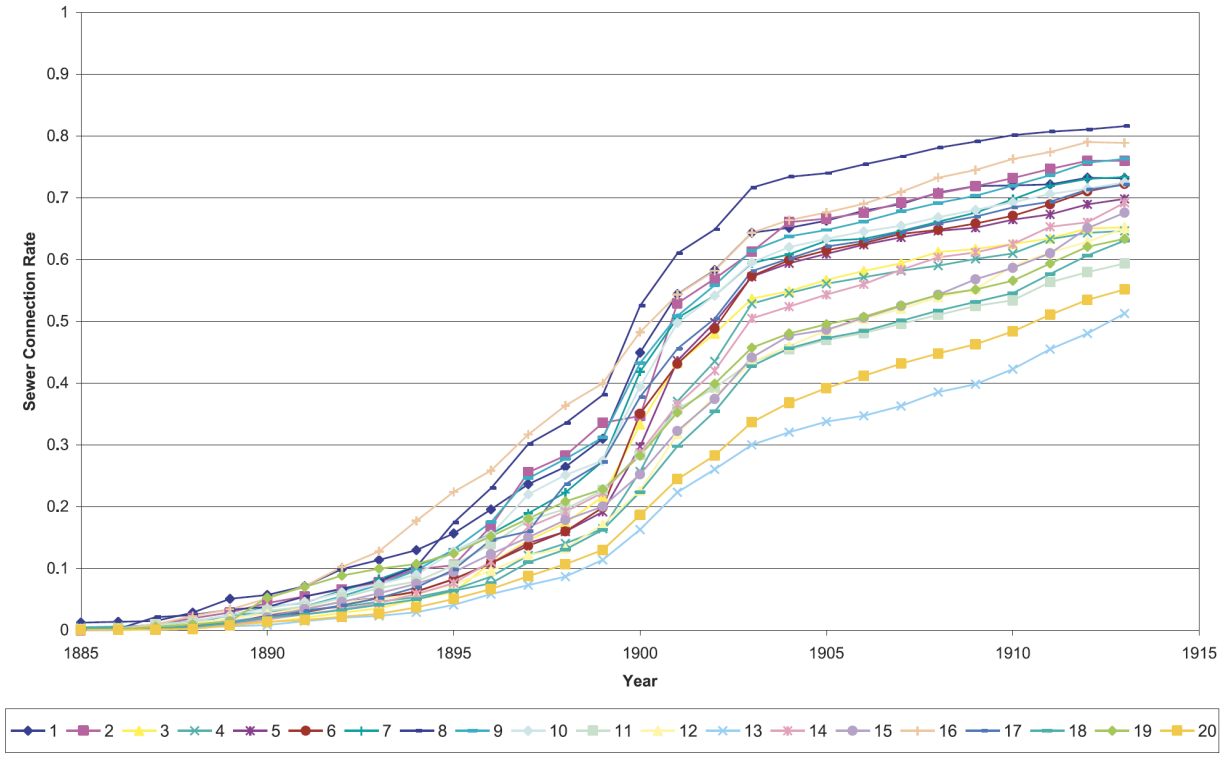


Fig. 3. Share of buildings connected to the sewer by districts.

Black children in US benefited less from clean water if city was segregated

Table 3: Difference-in-differences estimates of the relationship between waterworks construction and infant mortality

DV is whether mother has lost a child by 1900				
Sample:	All cities (1)	All cities (2)	Above med. city size (3)	Top 25 % city size (4)
Panel A: White Mothers				
Water Exposure	-0.037***	-0.033***	-0.026*	-0.030
	(0.012)	(0.012)	(0.014)	(0.018)
Water Exposure × Segregated City		-0.010	-0.020*	-0.028
		(0.008)	(0.011)	(0.017)
Sample Mean	0.375	0.375	0.374	0.375
Observations	1,704,294	1,704,294	1,543,628	1,336,236
R-squared	0.068	0.068	0.066	0.065
Panel B: Black Mothers				
Water Exposure	-0.041***	-0.126***	-0.149***	-0.132***
	(0.012)	(0.022)	(0.031)	(0.044)
Water Exposure × Segregated City		0.093***	0.112***	0.088*
		(0.021)	(0.031)	(0.046)
Sample Mean	0.541	0.541	0.541	0.540
Observations	278,839	278,839	238,671	201,970
R-squared	0.068	0.068	0.062	0.058

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors (clustered at the city level) are reported in parentheses. Sample is restricted to black and white women between the ages of 18 and 55 who have had given birth to at least one child (at the time of 1900 census enumeration). Water exposure is the share of fertile years (ages 18 to 45) that the mother resided in a city with a constructed waterworks. Each regression includes city fixed effects, cohort fixed effects, and an indicator for whether the individual is white or not. Segregation is measured using the Logan-Parman segregation index.

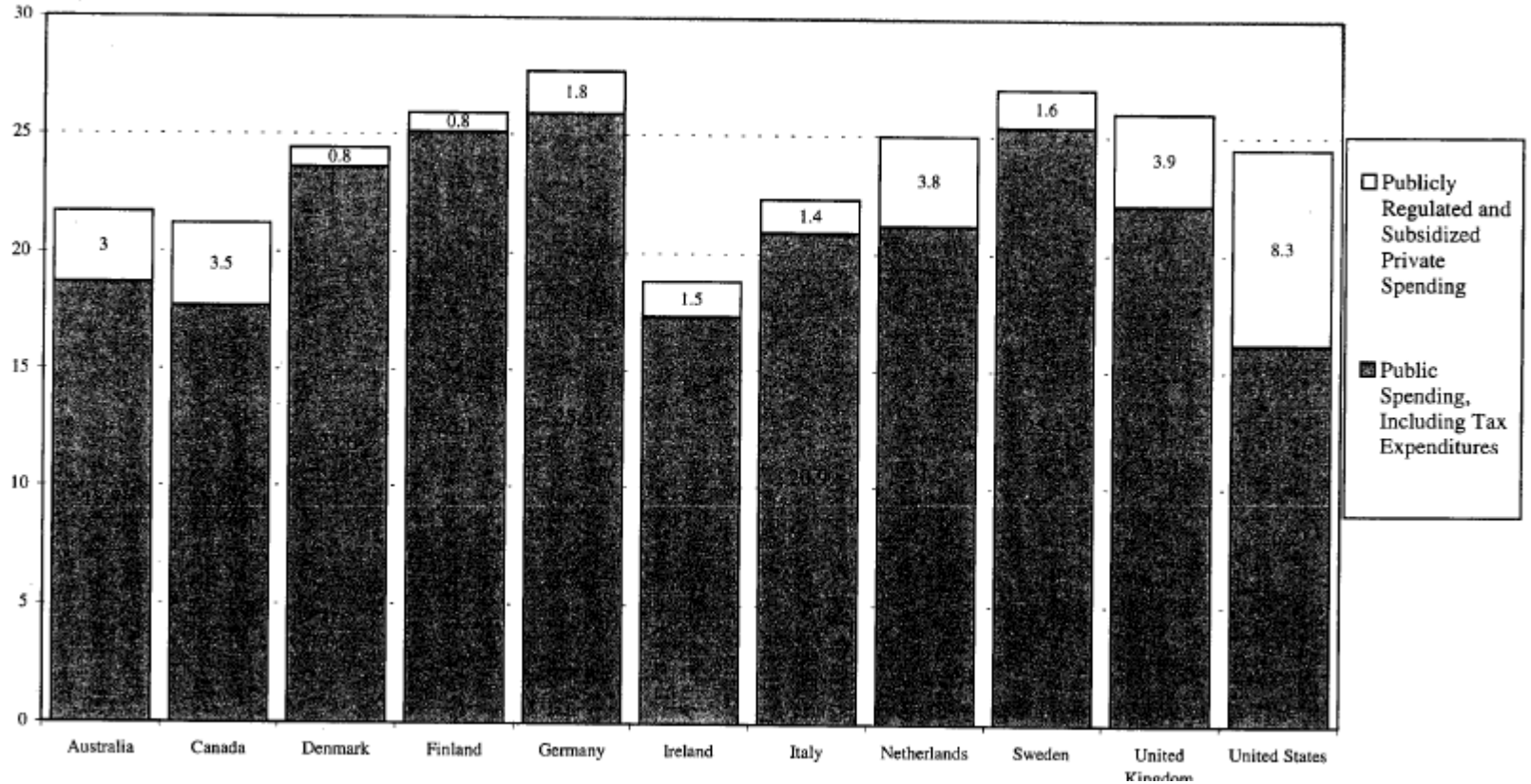
Source: Beach, Parman, Saavedra, 2022 (this is 2018 version)

Lecture 8 - Social programs and social insurance

- Why doesn't the US have a European-style welfare state today?
- Key historical moment: Supreme court before/after New Deal
- Pre-New Deal: Unemployment insurance and state cash transfers
- Post-New Deal: Federal pensions through Social Security
- Expansion in 1960s: Medicare, Food stamps

Expenditures on social programs: US vs. Europe

Data for 1990s as % GDP



Key features of US system:

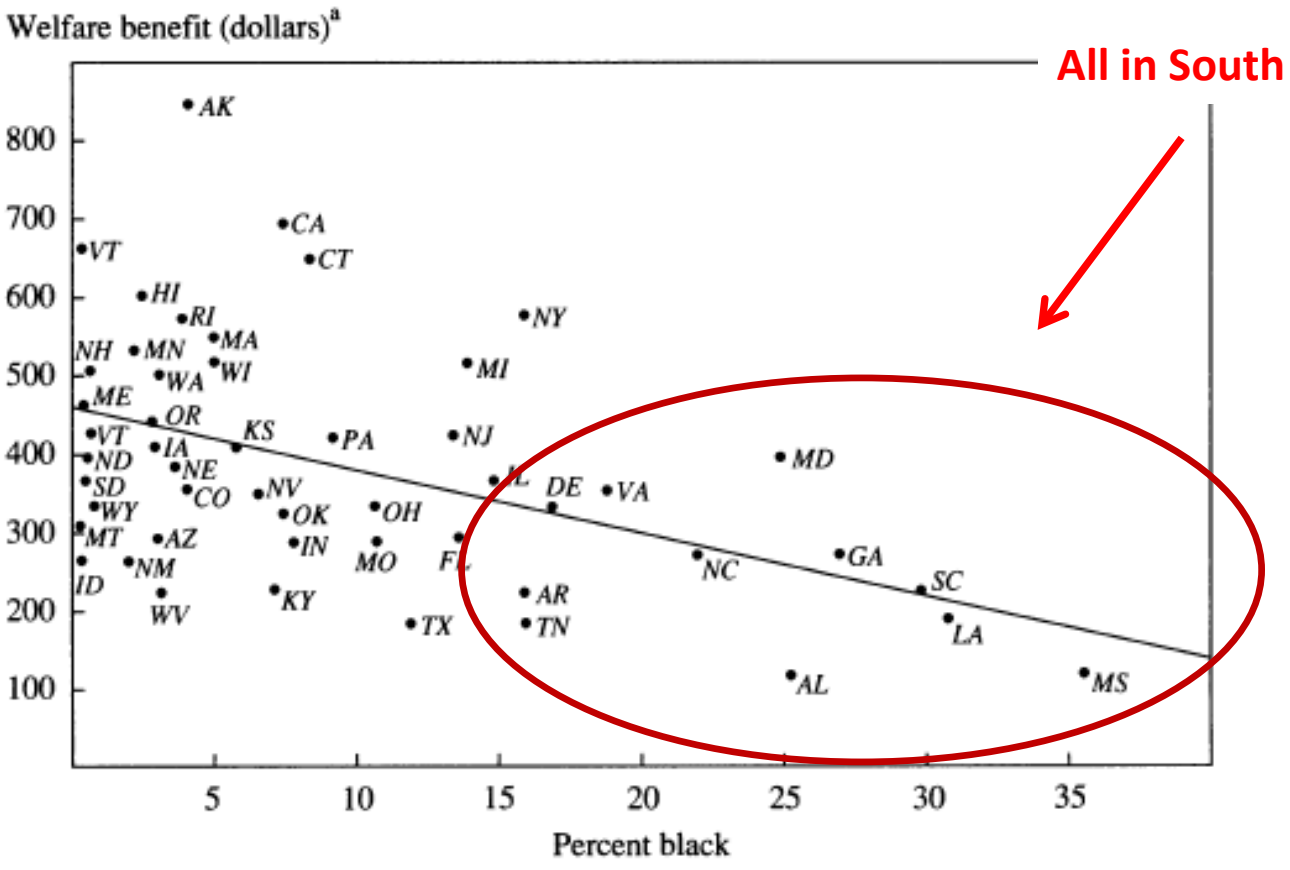
1. Benefits tied to employment
2. Federal/state partnership via block grants, etc.

Includes cash benefits for disability, old age, death of a spouse, occupational injury, sickness, childbirth, unemployment, and poverty. Also includes spending on housing, health care, and services for elderly.

Source: J. Hacker, 2004

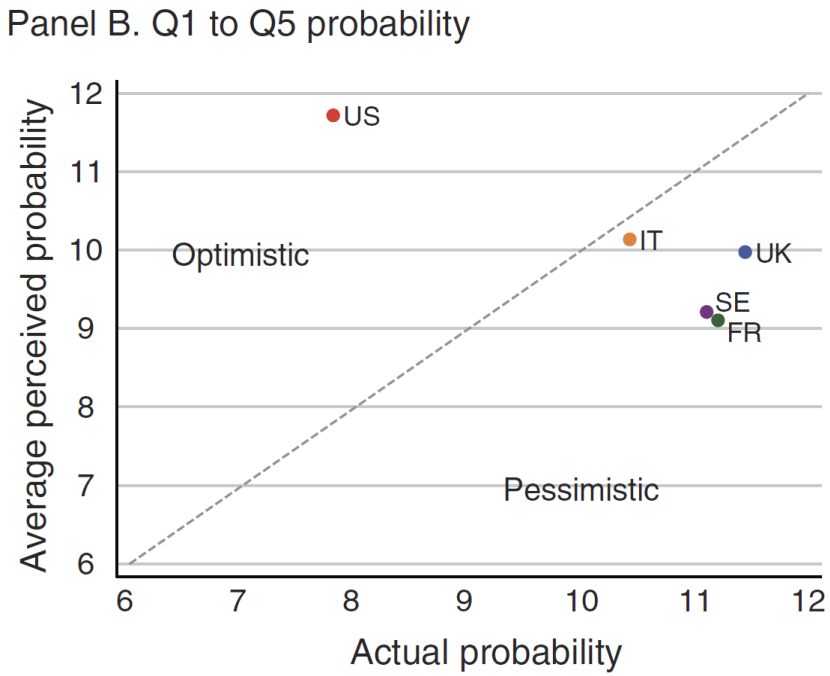
Why does US have fewer direct expenditures on social programs? (Alesina, Glaeser, Sacerdote, 2001)

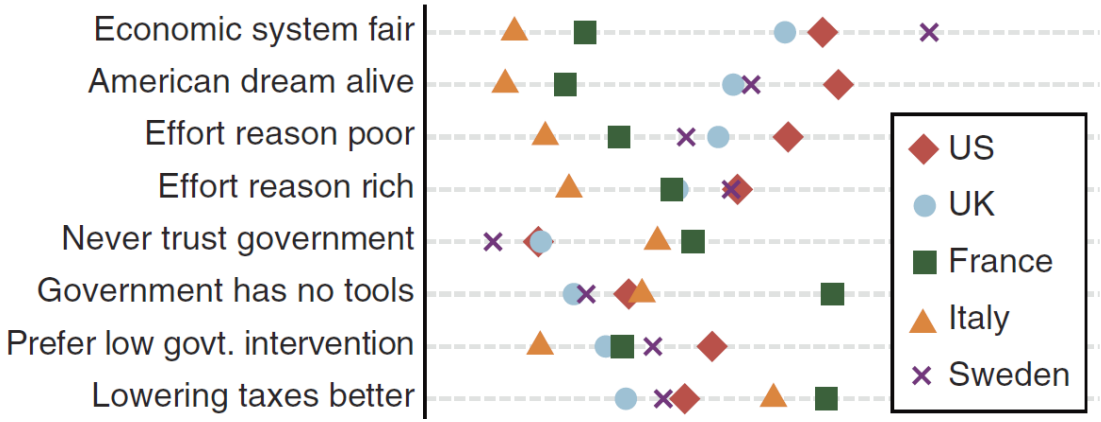
Figure 5. Relationship between Welfare Benefit and the Black Population Share, by State, 1990



- Not due to higher income inequality: Would predict *more* support for transfers, via median voter model
- Not due to lower social mobility: Would predict *more* support because lower probability of finding yourself at top (but misperceptions…)
- Racial divisions matter – what will happen to Europe with higher immigration?

Americans misperceive degree of social mobility; perhaps as a result they perceive economic system as "fair"





Source: Alesina, Stantcheva, Teso, AER 2018

Despite long-standing beliefs in mobility, American social safety net expanded in 1930s and 1960s. History matters!

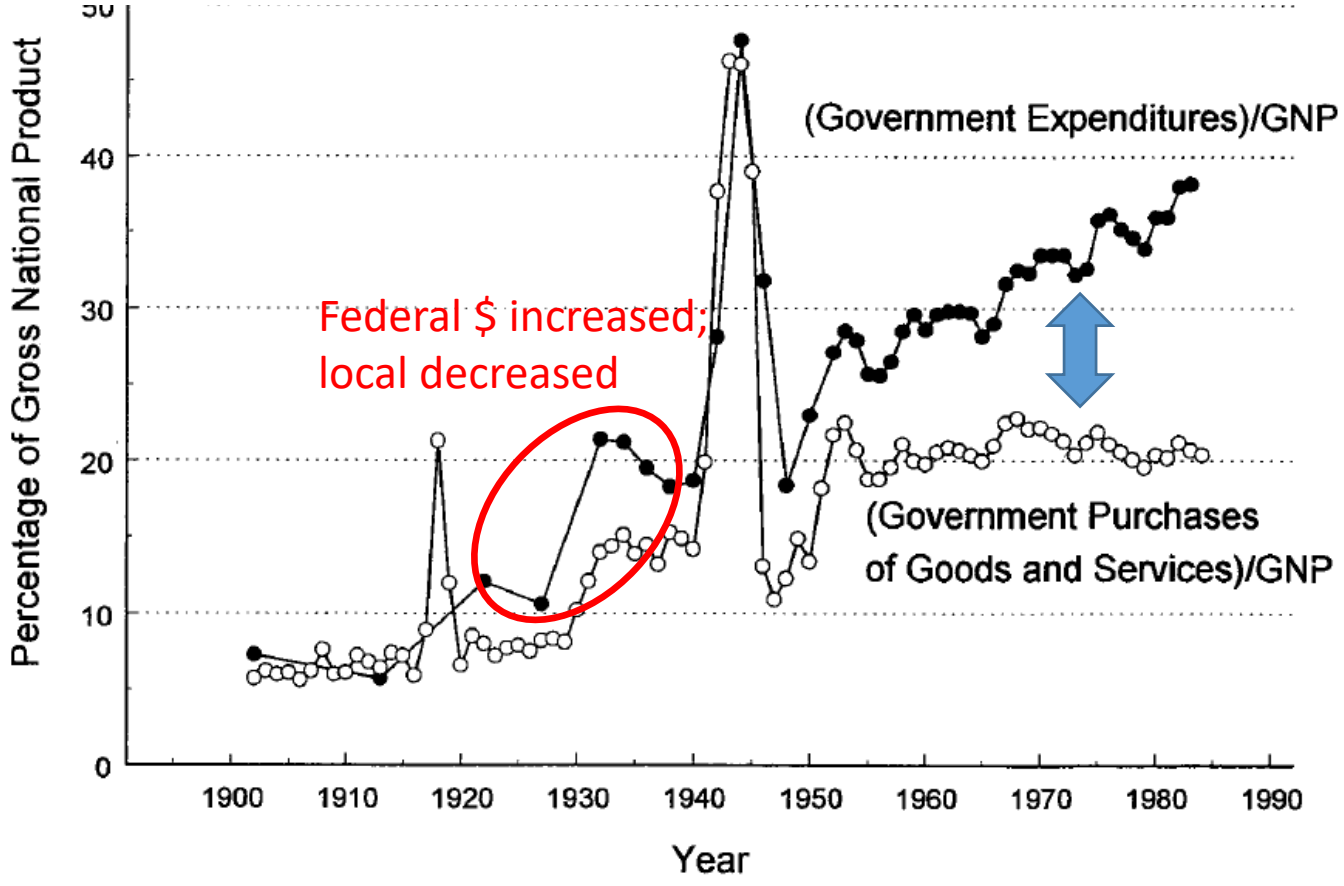


Fig. 1 Government (national, state, and local) as a share of GNP, 1902–84
Source: Higgs (1987, table 2.1).

Source: Bordo, Goldin, and White, 1998

The New Deal as a "defining moment"?

- First set of New Deal legislation:
  - Agricultural Adjustment Act (1933)
  - National Industrial Recovery Act (1933)
- Supreme Court declared unconstitutional
- Second set of legislation:
  - Agricultural Adjustment Act (1938)
  - Wagner Act (1935)
  - Fair Labor Standards Act (1938)
  - Social Security Act (1935)
  - Emergency Relief Act (1935)

1. Court changes view on federal regulation of the economy
2. Public changes view on government role in providing social insurance and public goods

Changing direction on the Supreme Court

- “The act invades the reserved rights of the states. It is a statutory plan to regulate and control agricultural production, a matter beyond the powers delegated to the federal government.” *US v. Butler, 1935*

- "[Although] activities may be intrastate in character when separately considered, if they have such a close and substantial relation to interstate commerce that their control is essential or appropriate to protect that commerce from burdens and obstructions, congress cannot be denied the power to exercise that control”

NLRB v. Jones and Laughlin (1937)

Unemployment Insurance established *before* the New Deal

- 7 states had some form of UI before 1929. 25 acted by 1933
- Unique features: Federal-state structure, experience rating, limited duration
- Design intended to appease court: States can "opt in." But, federal gov't imposes tax of 3% on wages in eligible firms, all but 0.3% of it waived if state passes UI
- Experience rating and duration adopted to address moral hazard by firms (seasonality) and workers
- Baicker, Goldin and Katz, 1998 argue that features of modern state programs are correlated with historical attributes of the states at time of founding

Cash transfers to poor families another example of *pre*-New Deal program

- State Mother's Pension programs (1911-35) pre-dated federal AFDC (1935-1996; now TANF). Established by states and administered by counties. Substantial cross- and within-state variation

- Eligibility: Mother poor; husband absent or disabled. Benefits varied from $10/month per child for Iowa to $35/month for Ohio (~15% of fam income)

- Aizer, et al. (2015) evaluate long-run outcomes for recipient children relative to kids whose mother applied but was rejected (N = 16,000). Data from 11 states with names matched to death records

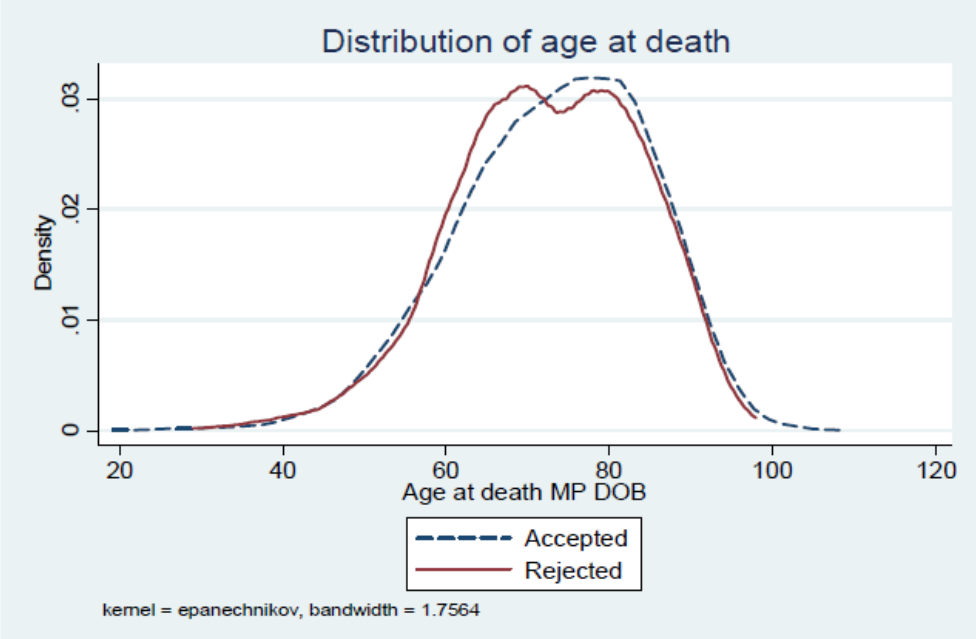
Sons of accepted mothers live 1 year longer

Also compared to orphans or children of divorced moms who did not apply

Fig. 1: Distribution of Age at Death.

Boys of Accepted and Rejected Applicants

a. All matches



- Consider intermediate outcomes. Match to WWII enlistment records and 1940 Census

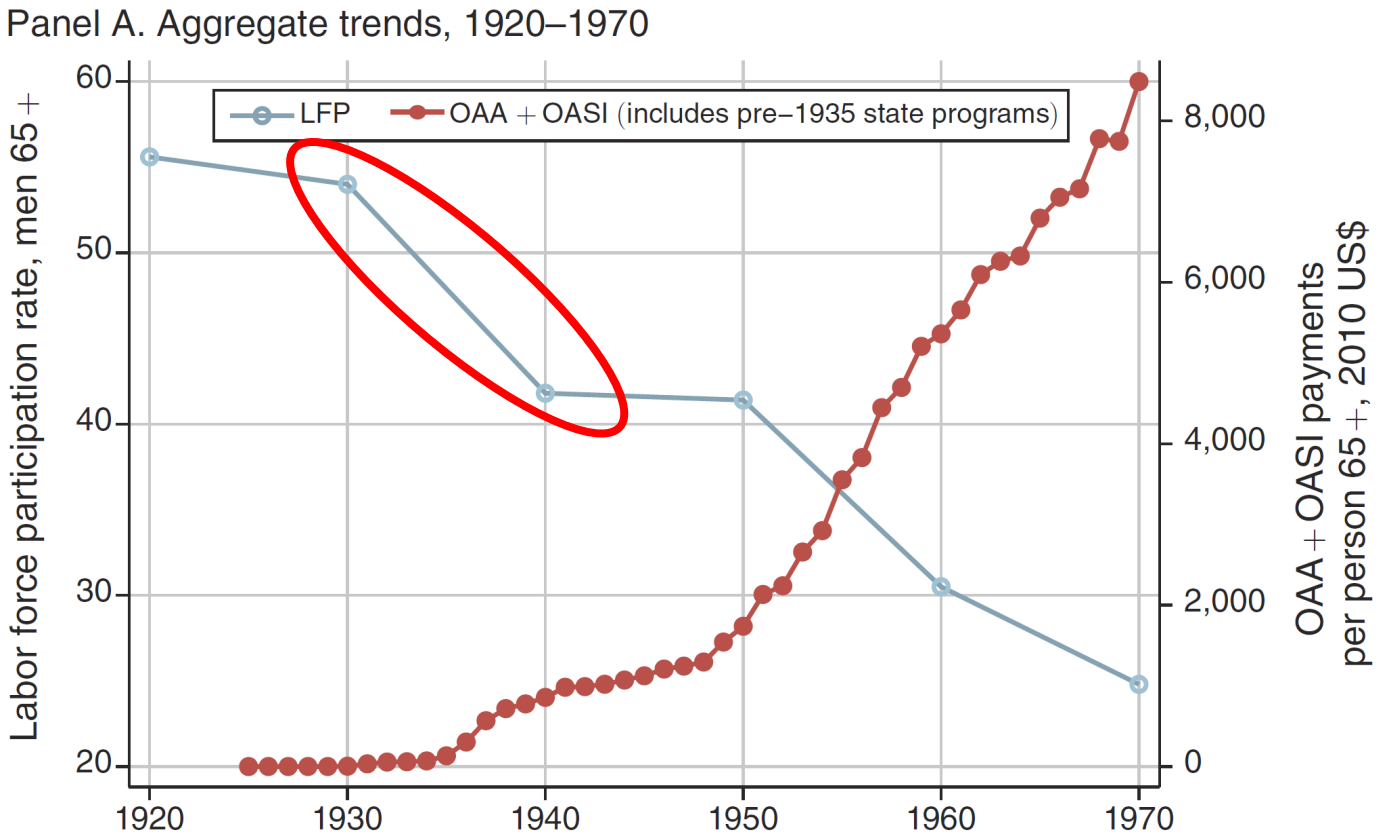
- Eligible children were:
  - half as likely to be underweight (nutrition)
  - had 0.4 additional years of school
  - had 14% higher income

Source: Aizer, et al., AER 2015

Federal pensions (Social Security) as legacy of New Deal

- By 1934, 27 states had cash assistance for needy elderly
- Social Security, a non-means tested federal pension system, was established in 1935; no payments until 1940
- Coupled with immediate aid through Old Age Assistance (OAA), precursor to today's Supplemental Security Income (SSI). By 1940, covered 22% of elderly
- OAA structured as fed-state partnership (50-50%). Fetter and Lockwood (2018) use variation to estimate effect on labor supply

As federal support for elderly increased, LFP decreased



Note: Panel A shows labor force participation rate of men 65 and older, from Series D35 of US Bureau of the Census (1975), and payments under Old Age Assistance (OAA) and Old Age and Survivors Insurance (OASI) per person 65 and older, in 2010 US dollars. OAA payments data come from Parker (1936) for 1925 to 1935 and Series Bf621 of Carter et al. (2006) for 1936 onward. OASI payments data come from Series BF396 of Carter et al. (2006).

Source: Fetter and Lockwood, AER 2018

LFP of elderly lower in states with generous OAA benefits, only above 65 age cutoff

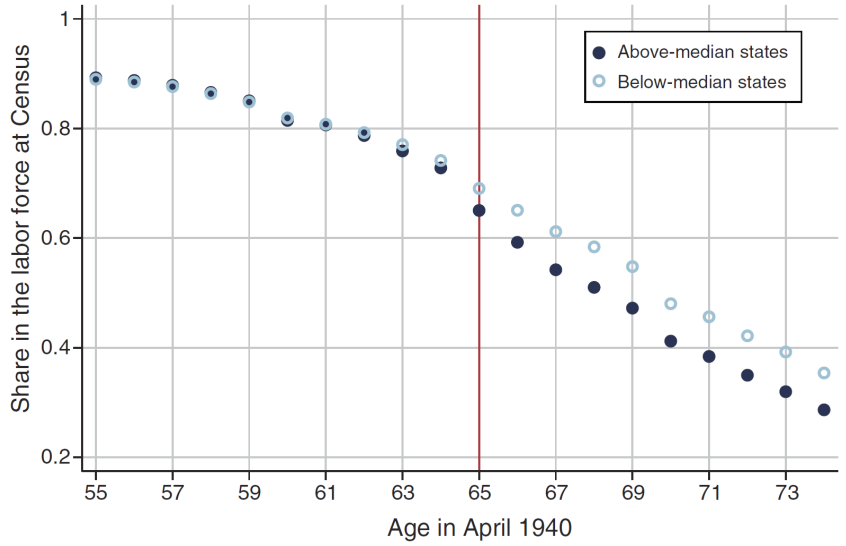


FIGURE 2. LABOR FORCE PARTICIPATION IN 1940, BY AGE AND STATE OAA PAYMENTS PER PERSON 65+

Note: Figure shows share of men in the labor force at the time of the 1940 Census, in states with above- and below-median OAA payments per person 65+ in 1939, for states with an eligibility age of 65 in 1939.

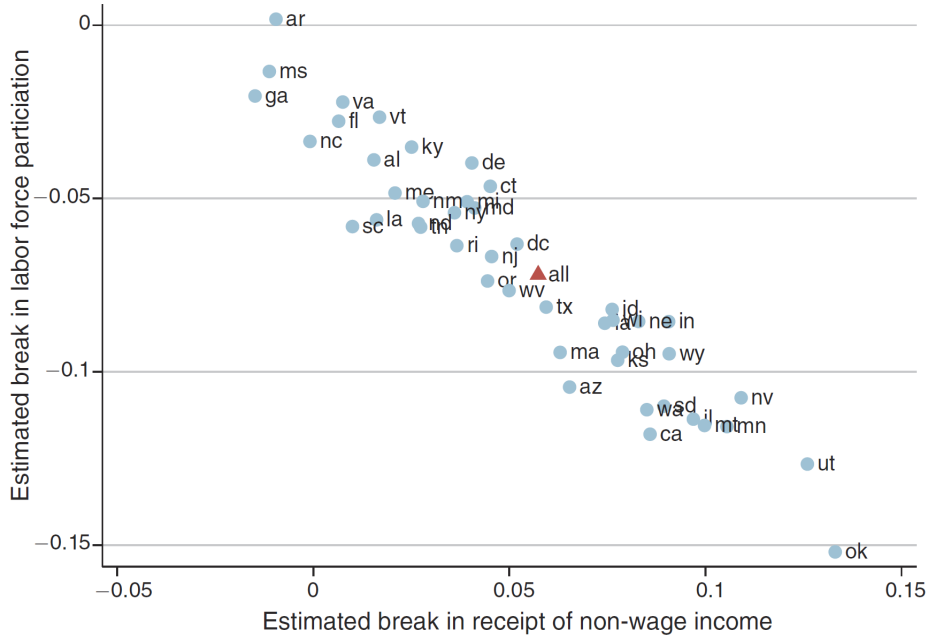


FIGURE 6. BREAKS IN NON-WAGE INCOME VERSUS BREAKS IN LABOR FORCE PARTICIPATION, BY STATE

Break in LFP for 65+ in 1940, above vs. below median generosity states

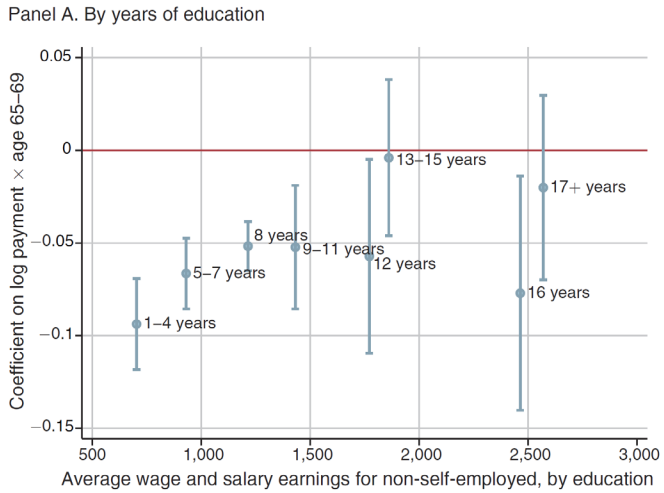
Estimated break is larger in states with greatest generosity (explains ~50% of 1930-40 drop in LF)

Income effect? (Leisure is normal good) OR substitution effect (Labor income is taxed)

- Largest effects for men with low labor income suggests mostly income effect

- 16% of men 65-74 on OAA. 8.5% estimated to leave LF. So, ~50% got OAA and stayed in LF. At lower bound, $1 benefit valued at $0.50.

- Lifecycle model of work and retirement suggests that benefits valued at even higher rate



Earliest old age pensions from Union Army

TABLE IV

RETIREMENT RATES BY DISABILITY AMONG VETERANS LESS THAN 70 YEARS OF AGE

	Percent retired	Sample size	χ^2	Prob
Rated mildly disabled				
Receiving ≤ $12/month	5.0	100		
Receiving > $12/month	25.0	8	4.9	0.03
Rated fairly disabled				
Receiving ≤ $12/month	10.7	131		
Receiving > $12/month	20.0	30	1.9	0.16
Rated very disabled				
Receiving ≤ $12/month	14.0	43		
Receiving > $12/month	17.0	59	0.2	0.68

Note. The χ^2 is for a test to show that the percent of men who are retired differs by pension amount within each category.

- 35% of men in late 50s in North in 1900 on pension
- Detailed surgeon reports on health conditions, mortality, retirement info

- Can use "war time" injury to instrument for pension size
- No effect of veteran status on pr(retire) in South

Source: Costa, QJE 1995

Temporary relief programs included in New Deal

- Total = 4-8% of GDP (c. 1935)

- Specific programs
  - Public Works Administration = infrastructure jobs
  - Works Progress Administration = state and local block grants to provide work/direct relief
  - Agricultural Administration Act = payments to farmers to keep land fallow

- Fishback and co-authors collected annual county-level data on federal $ per program

Relief spending buoyed local economies

TABLE 3 — OLS AND 2SLS ESTIMATES OF THE IMPACT OF NEW DEAL GRANTS ON THE RETAIL SA

	OLS Retail Sales Growth Equations				Second-Stage Retail Sales Growth	
Variables	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Endogenous Variables:						
Per capita public works and relief spending	0.000046	3.13	0.000023	1.55	0.00082	3.25
Per capita AAA spending	–0.00025	–15.3	–0.00004	–1.96	–0.00008	–0.41

- OLS: One standard deviation increase in relief = 0.05 SD increase retail sales
- IV: 1 SD increase = nearly 1 SD increase in retail sales
- Expect large endogeneity bias because $s flow to counties that are hard hit
- Key instrument = SD in democratic votes (1896-1928) = "swing districts"
- Note that AAA has, if anything, negative effect on county

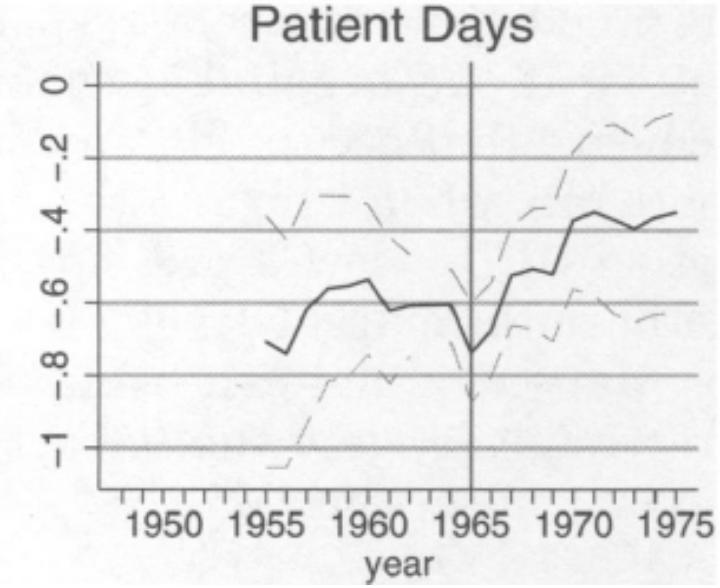
Fishback, Horrace, Kantor, JEH 2005

Expansion of federal programs in 1960s

- **Medicare and Medicaid**: Provided health insurance for ~40 million individuals, either 65+ or below income threshold
- **Elementary and Secondary School Act**: Head Start preschools, first federal funding for K-12, including for special education programs
- **Welfare programs**: Expanding eligibility for Social Security (including disability), food stamps (now SNAP)
- Clean water and air acts, local War on Poverty programs, Civil Rights Act and expansion in minimum wage cvoerage

(1) Use establishment of new programs (rather than incremental changes) to study program effects

- One example: Effect of insurance coverage on health care utilization
- Studies of individual-level coverage found little effect. But Medicare was large enough to have potential GE effects, hospital responses
- Use variation in pre-existing coverage for elderly by region (e.g., 50% for New England, 12% for East South Central but raised to 100% for all)
- Expenditures increased ~40% by 5 years after 1965; can explain half of growth in health care spending during period

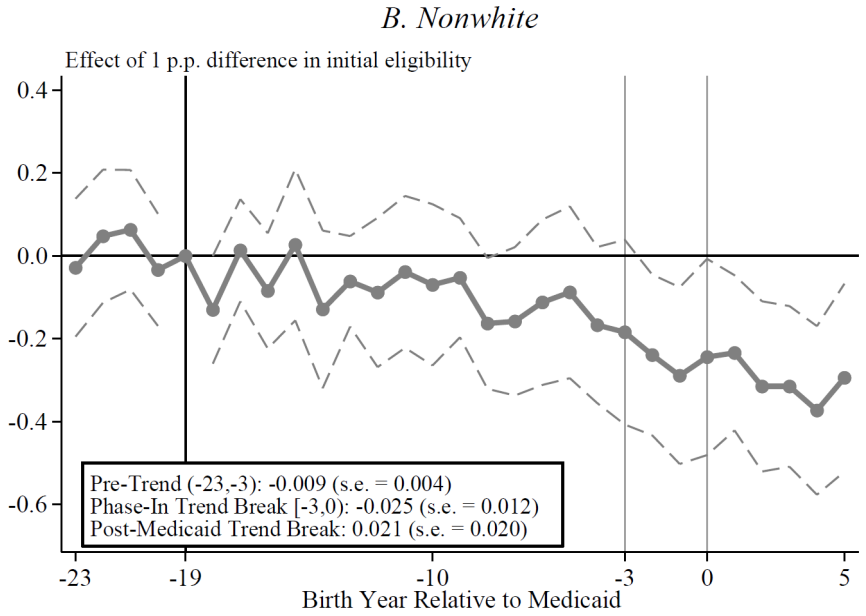


Source: Finkelstein, QJE 2007

(2) Long-run effects of programs on adult outcomes today

- First example = Medicaid/CHIP covers 40% of children today ($90b/year)
- Years of exposure: Born close to program start (1966-70) and in state with greater welfare use (automatic enrollment). Allows use of event study design
- State of birth-by-year design allows use of census data: disability, employment, transfer payments, income

Figure 5. Early Childhood Eligibility Lowers Adult Disability: Event-Study Estimates of Medicaid's Effect on Rates of Ambulatory Difficulty by Race (coefficients×100)



Notes: The dependent variable is the share of respondents in each state-of-birth-by-cohort cell who report having a "long-lasting condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying" (ambulatory difficulty). The sample includes Census/ACS years 2000-2007, when the question text was comparable. The figure plots the estimated coefficients on interactions between $AFDC^{*}_{rs}$ and event-time dummies for 23 years before and five years after Medicaid. Time -19 is omitted. The model includes birth-state, region-by-birth-year, and Medicaid-year-by-birth-year fixed effects; birth year per-capita income and general fertility rate. The nonwhite estimates also adjust for a linear trend interacted with $AFDC^{*}_{rs}$ for each Medicaid year for event-times prior to -15. Estimates are weighted by the sum of the Census weights in each cell. The dashed lines are based

Source: Goodman Bacon, AER 2021

Medicaid benefits save later program costs, rate of 2-to-1

Figure 6. Early Childhood Eligibility Lowers Disability Transfer Receipt and Increases Employment: Event-Study Estimates of Medicaid's Effect on Rates of Employment and Disability Benefit Receipt (coefficients×100)

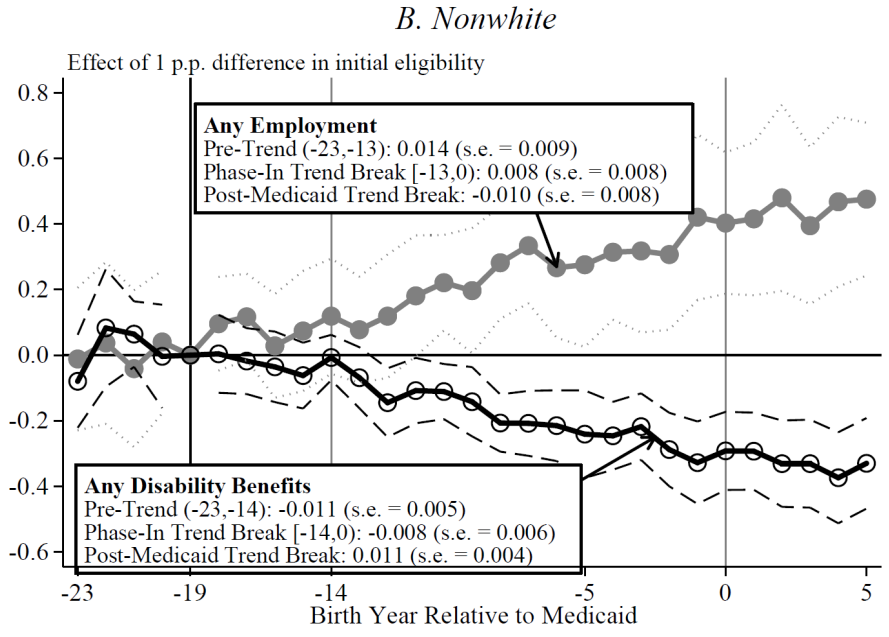
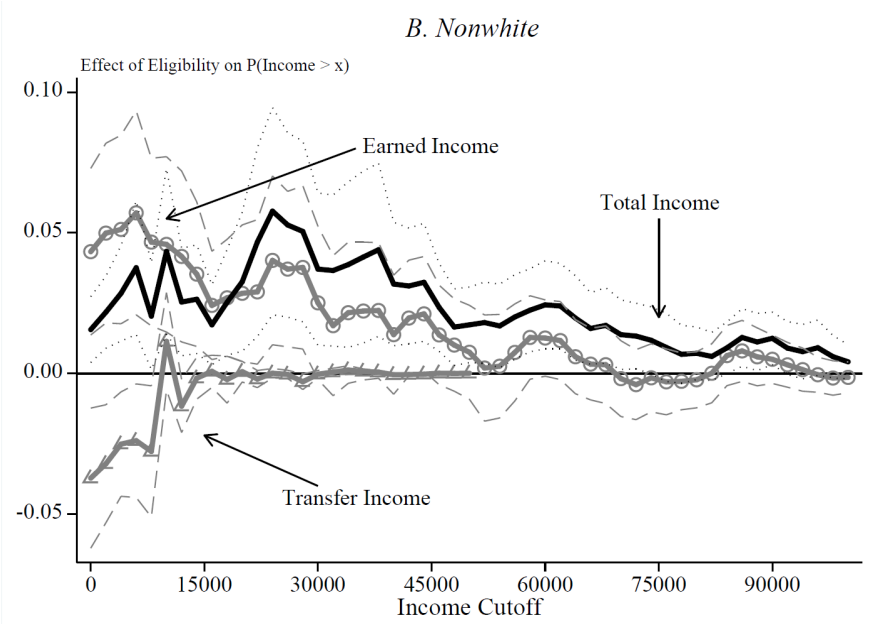


Figure 7. Early Childhood Medicaid Eligibility Shifts Income from Benefits to Earnings: Instrumental Variables Estimates on the Distribution of Income by Source



Notes: The figure plots instrumental variables estimates of the effect of cumulative Medicaid eligibility at ages 0-11 on the probability of earnings, transfer income, or total income greater than the amount on the *x*-axis (measured in $2,000 bins in 2012 dollars). The sample includes Census/ACS years from 2000 to 2017. $50,000 is the maximum of the transfer income variable.

Second example: Effect of food stamps on adult health

- In 2018, 17% of kids lived in HH with food stamps (total spending = $57b/year)
- Food stamps funded in 1964; counties applied to participate but wait list for roll out
- Some counties delayed because preferred existing Commodity Distribution Program, esp. if strong agricultural interests
- Exposure by county, year of birth, and parental income (= high school education) up to age 5. Add state time trend and 1960 characteristics (e.g., % black, % urban) x year FE

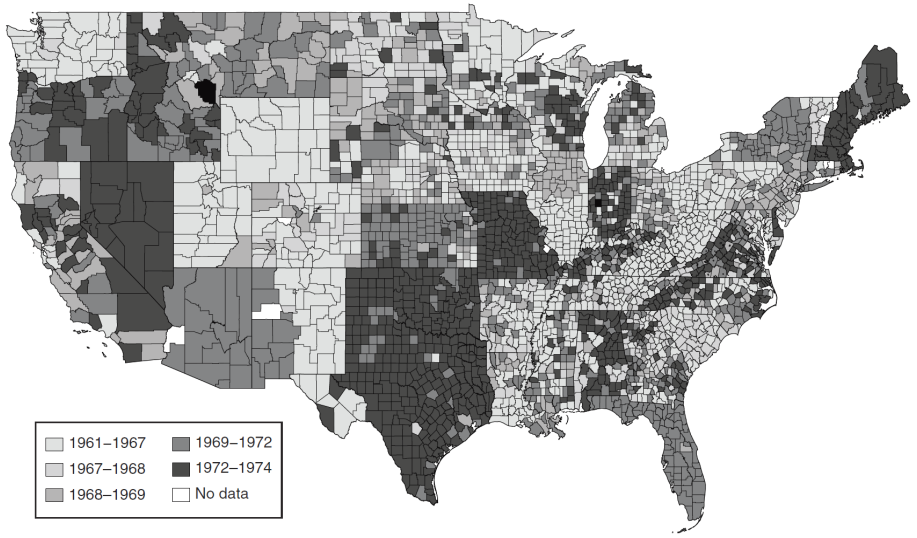


FIGURE 2. FOOD STAMP PROGRAM START DATE, BY COUNTY, 1961–1974

Notes: Authors' tabulations of food stamp administrative data (US Department of Agriculture, various years). The shading corresponds to the county FSP start date, where darker shading indicates later county implementation.

Source: Hoynes, Schanzenbach and Almond, AER 2016

Food stamps in early childhood has long run benefits (esp. for women)

TABLE 5—METABOLIC SYNDROME AND ECONOMIC SELF-SUFFICIENCY IN THE HIGH PARTICIPATION SAMPLE, BY GENDER

	Women			Men		
	Metabolic syndrome (index)	Good health	Economic self-sufficien-cy (index)	Metabolic syndrome (index)	Good health	Economic self-sufficien-cy (index)
FS share IU–5	−0.312**	0.336***	0.306*	−0.526**	−0.077	0.005
	(0.130)	(0.100)	(0.164)	(0.251)	(0.112)	(0.168)
Mean of dependent variable	0.03	0.53	−0.37	−0.01	0.66	−0.11
Observations	5,062	15,702	12,208	3,184	10,036	7,907
R^2	0.37	0.22	0.43	0.32	0.18	0.46

Notes: Each parameter is from a separate regression of the outcome variable on FSP exposure (share of months between conception and age five that FSP is in the county). The sample comes from the 1968–2009 PSID and includes heads and wives born between 1956 and 1981 who are between ages 18 and 53 (or 24–53 for economic outcomes). The high participation sample includes those born into families where the head had less than a high school education. Estimates are weighted using PSID weights and clustered on county of birth. The models con-

- Need county of birth so use PSID rather than census. Plus = more outcomes. Minus = smaller sample.
- Metabolic syndrome index = Obesity, diabetes, high blood pressure, heart disease
- Self-sufficiency index = High school or more, employed, not on benefits, not poor, family income

Third example = Headstart preschools

- Serves 1 million children today = $10b/year
- Substantial variation in role out due to administrative confusion
- Also well-defined ages of eligibility (3-5, but not 6-8)
- May expect some growth in program benefits over time with ramp up and also some spillover to older siblings

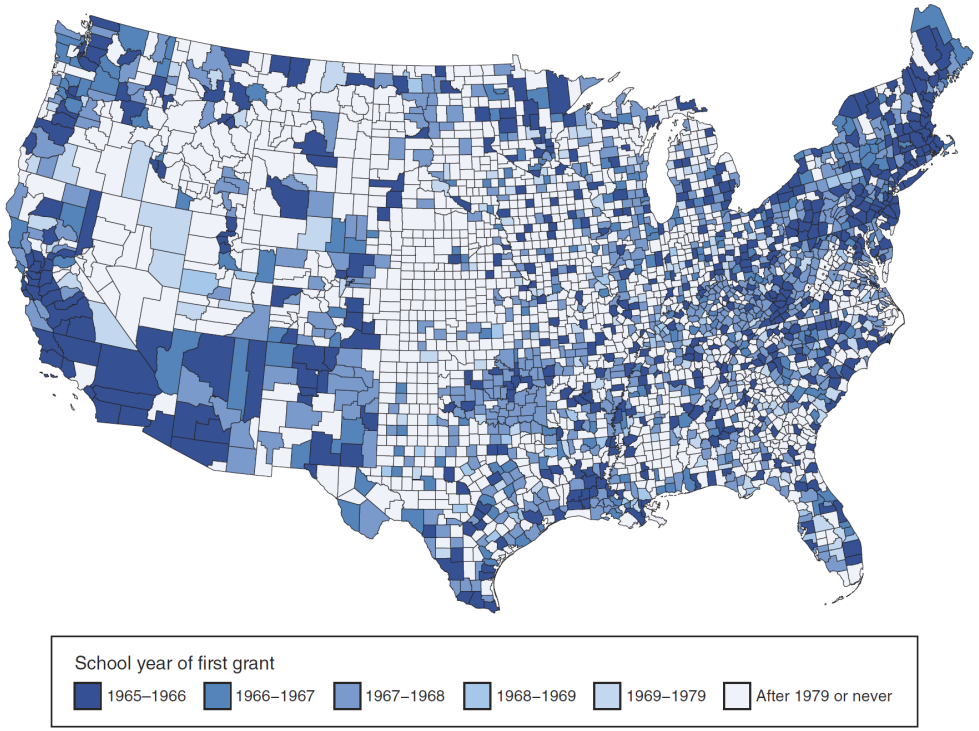
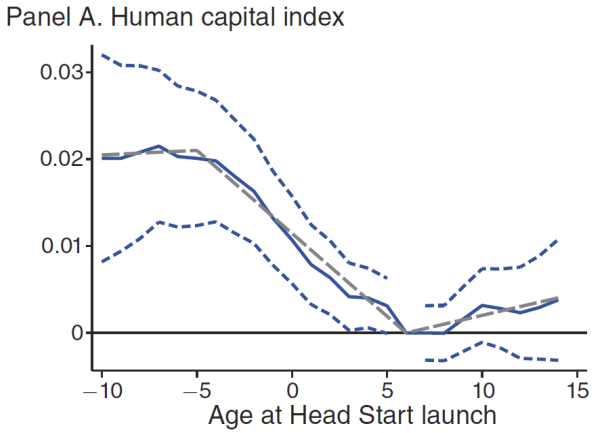
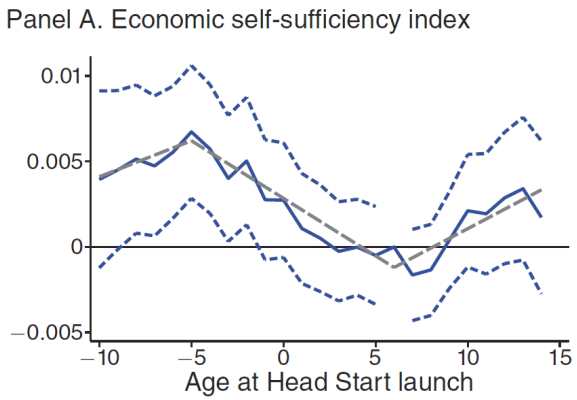


FIGURE 1. THE LAUNCH OF HEAD START BETWEEN 1965 AND 1980

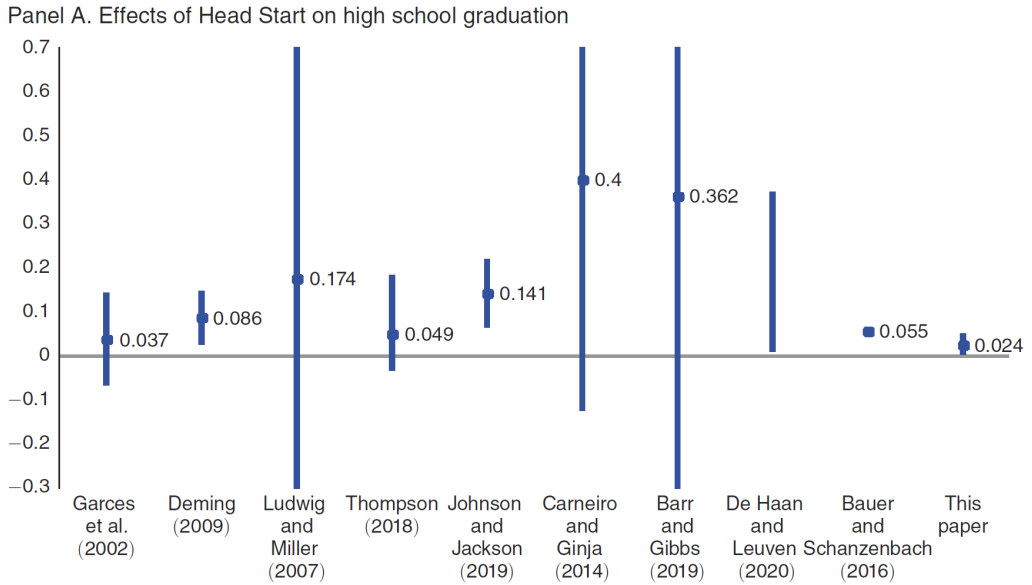
Source: Bailey, Sun and Timpe, AER 2021

Gains to education and self-sufficiency from exposure to Head Start





Due to falling use of transfers and rising tax receipts alone, Head Start has 5-9% public return



Much more precise estimates because link 2000 Census and ACS to Social Security Numident files to determine exact county of birth (requires access to Census RDC). Increase sample sizes 10,000 fold!). Able to pick up small but important effects

Lectures 9: social mobility in historical perspective

- Upward mobility in US today: the Opportunity Insight project (Chetty et al.)
  - Using big data to study how children's chances of moving up vary across areas in America

- Data sources: Anonymized Census data (2000, 2010, ACS) covering U.S. population linked to federal income tax returns from 1989-2015

- Link children to parents based on dependent claiming on tax returns

- Look at children in 1978-83 birth cohorts who were born in the U.S. or are authorized immigrants who came to the U.S. in childhood

- Analysis sample: 20.5 million children, 96% coverage rate of target sample

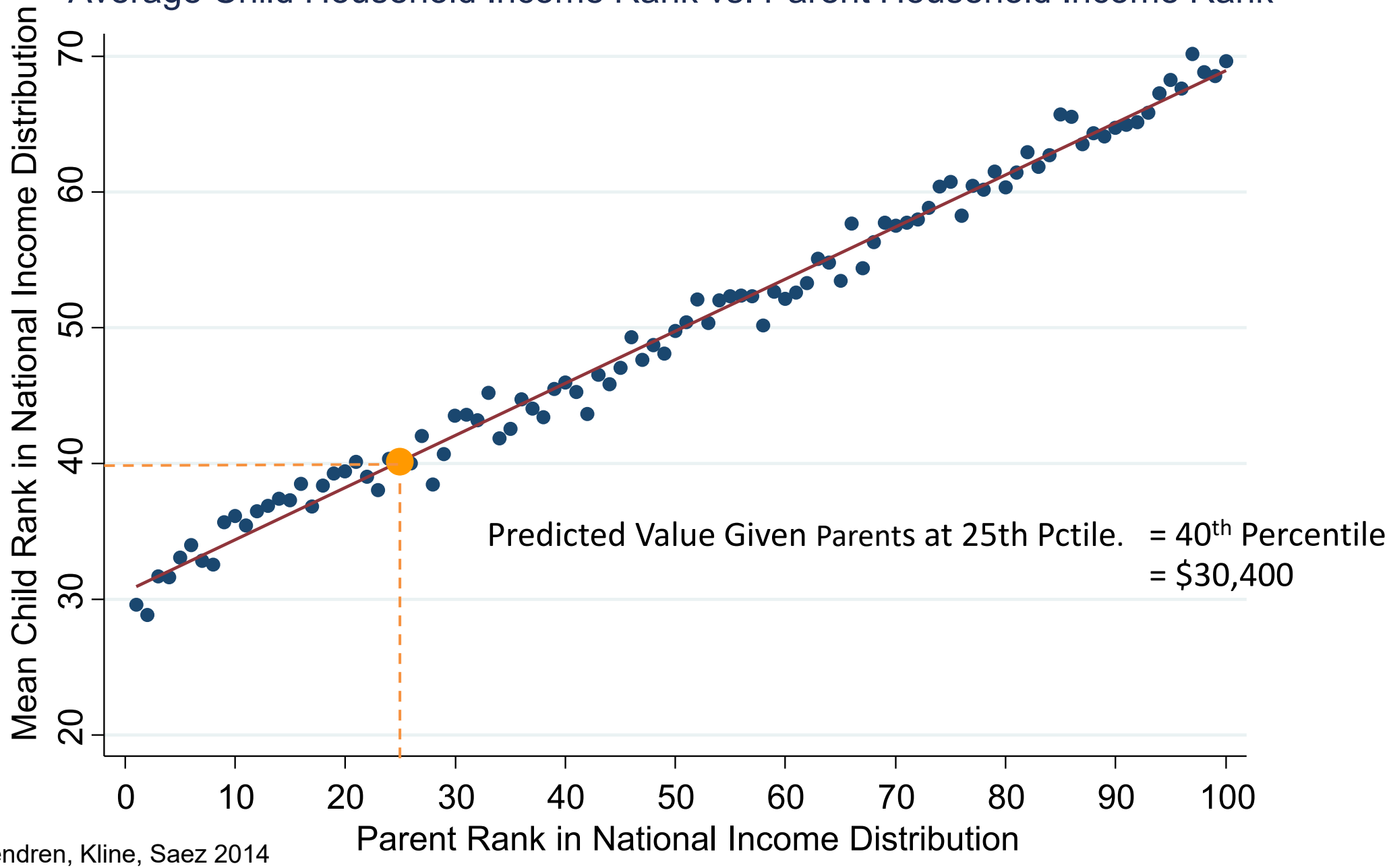
Chetty, Friedman, Hendren, Jones, Porter. "The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility" NBER wp, 2018

Measuring parents' and children's incomes in tax data

- Parents' household incomes: average income reported on Form 1040 tax return from 1994-2000
- Children's incomes measured from tax returns in 2014-15 (ages 31-37)
- Focus on percentile ranks in national distribution:
  - Rank children relative to others born in the same year and parents relative to other parents

Intergenerational Income Mobility for Children Raised in Chicago

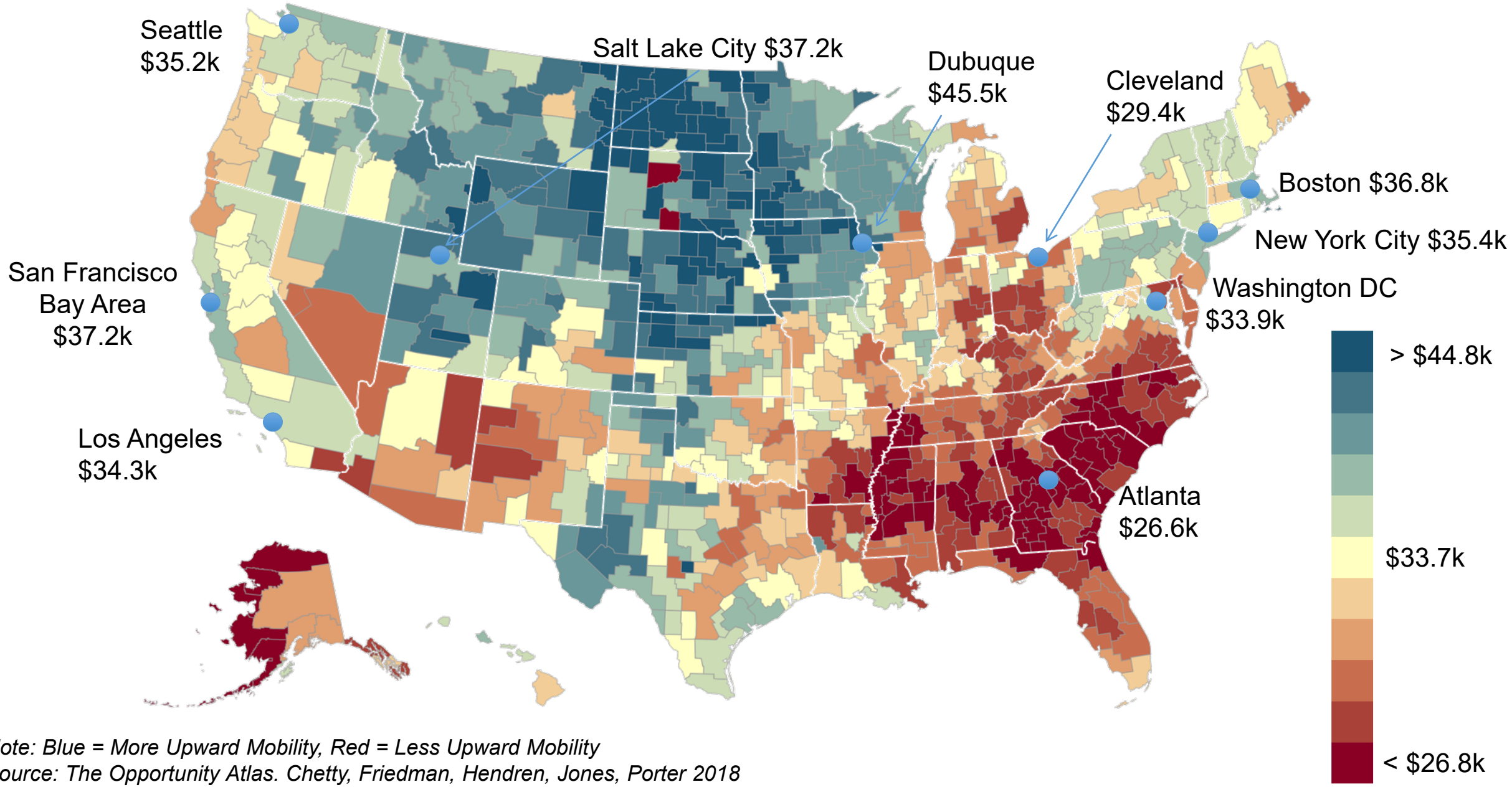
Average Child Household Income Rank vs. Parent Household Income Rank



Source: Chetty, Hendren, Kline, Saez 2014

The Geography of Upward Mobility in the United States

Average Household Income for Children with Parents Earning $27,000 (25th percentile)



Note: Blue = More Upward Mobility, Red = Less Upward Mobility

Source: The Opportunity Atlas. Chetty, Friedman, Hendren, Jones, Porter 2018

The American dream in historical perspective

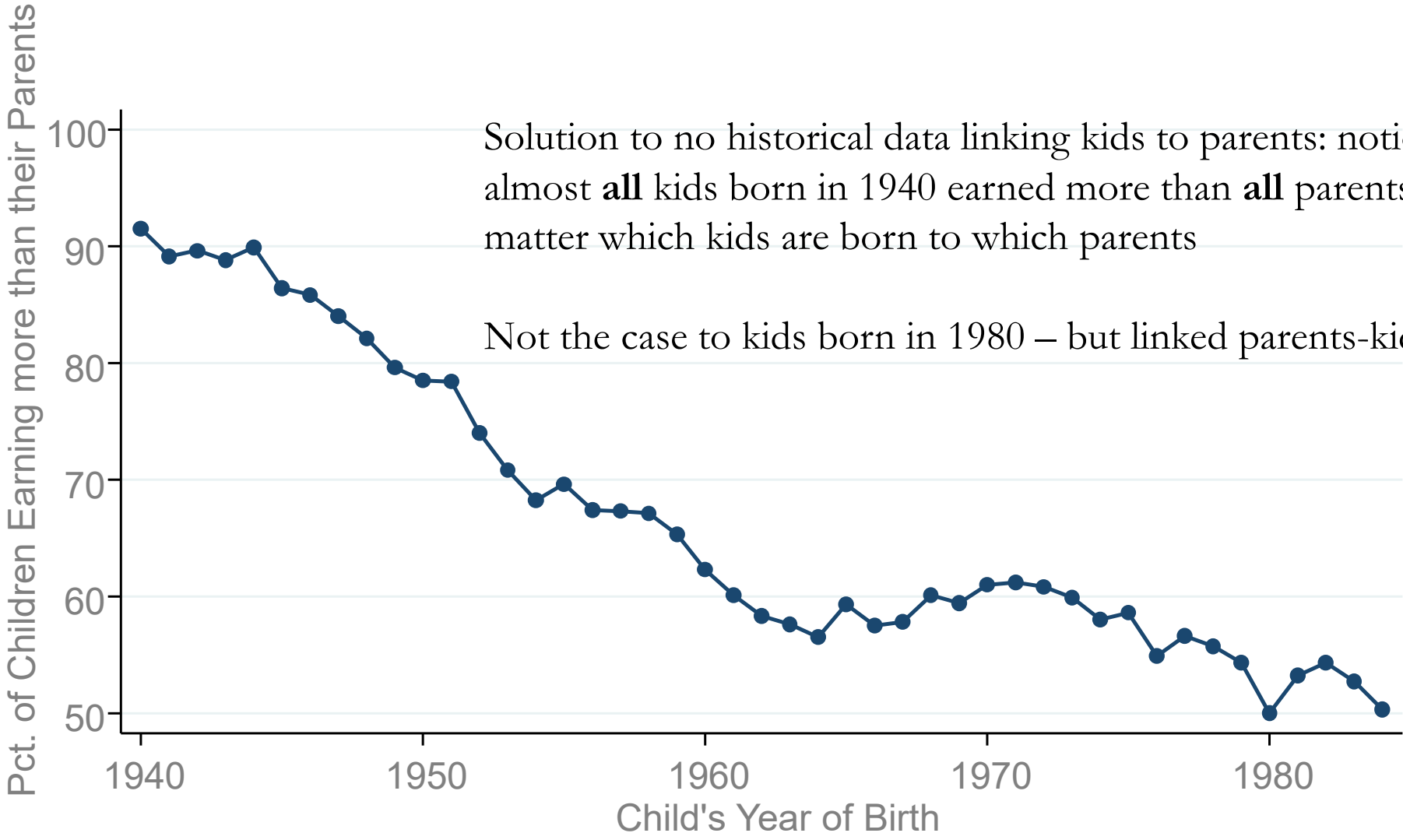
- The "American dream" is based on idea that in the past US has been a place of great upward mobility

- Was it? A historical perspective is crucial to understanding current mobility

- **Absolute mobility**: "Historically, American Dream has been defined as the aspiration that children should have higher standards of living than their parents" (Chetty)
  - What fraction of children earn more than their parents, and how has this changed over time?
- **Relative mobility**: "equality of opportunity" - does having rich/poor parents matter for life outcome?

- Challenge: until recently, no historical data that link parents and children

Absolute mobility: American dream is fading



Solution to no historical data linking kids to parents: noticing that almost **all** kids born in 1940 earned more than **all** parents → does not matter which kids are born to which parents

Not the case to kids born in 1980 – but linked parents-kids data

Chetty, Grusky, Hell, Hendren, Manduca, Narang. "The Fading American Dream: Trends in Absolute Income Mobility Since 1940." *Science* 2017.

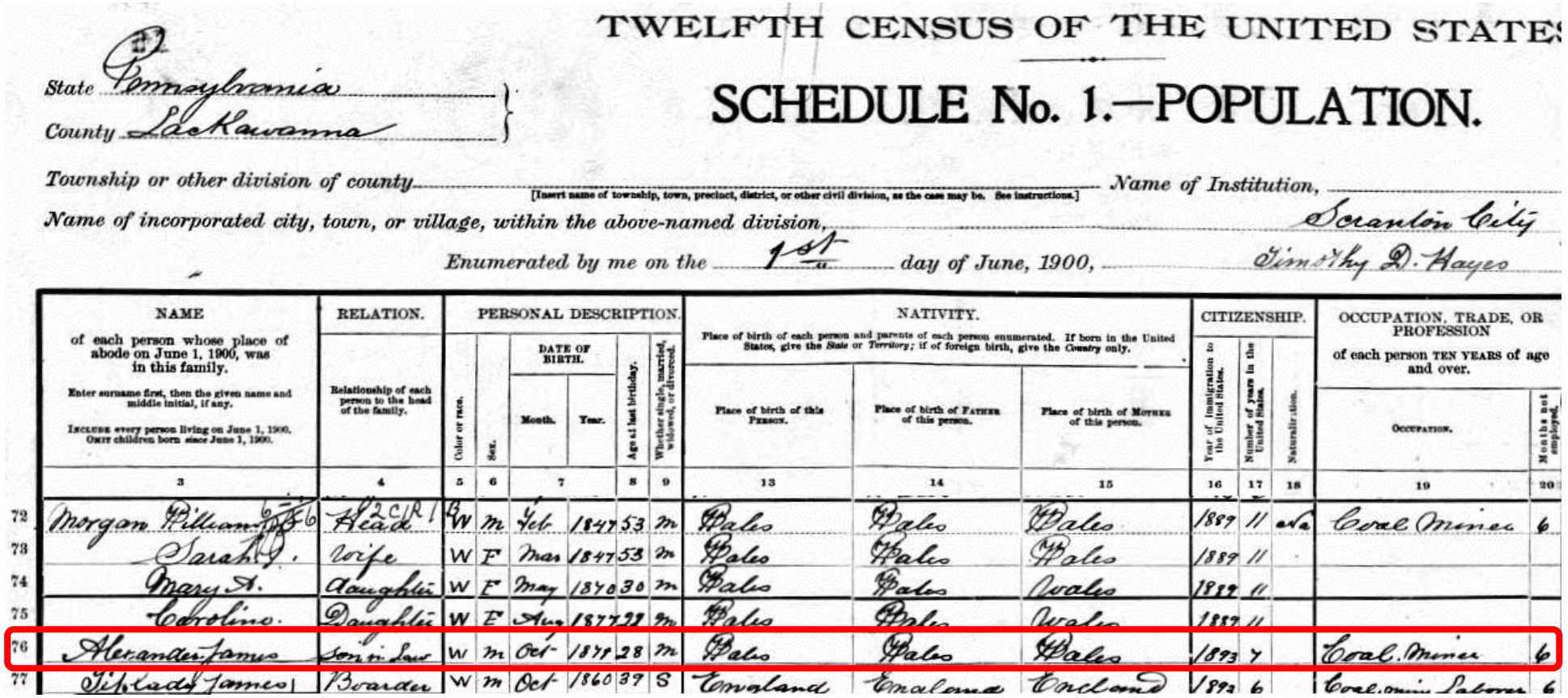
Creating linked historical data to bring new insights on the American Dream

- A short linking detour ☺

Creating linked historical data

- The linking promise
  - The recent digitization of historical complete count population censuses and advances in computing power allow social scientists to create large historical panel datasets for the first time
  - These longitudinal datasets offer new evidence on topics as varied as immigrant assimilation, the long-run effects of social programs and intergenerational mobility
- The linking challenge
  - We don't have unique IDs such as Social Security Number, so finding the same individual in two datasets requires using characteristics such as names and reported ages

Linking records across historical censuses
Example: Alexander James in 1900



TWELFTH CENSUS OF THE UNITED STATES

State Pennsylvania
County Lackawanna

SCHEDULE No. 1.—POPULATION.

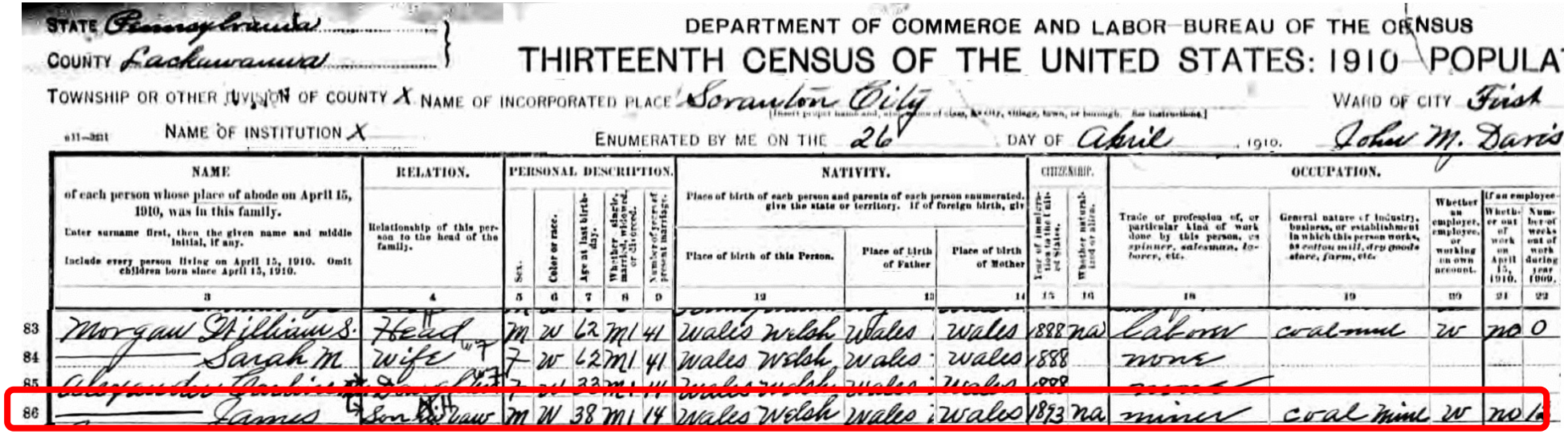
Township or other division of county ..... [Insert name of township, town, precinct, district, or other civil division, as the case may be. See instructions.] Name of Institution, ...

Name of incorporated city, town, or village, within the above-named division, Scranton City

Enumerated by me on the 1st day of June, 1900, Timothy D. Hayes

	NAME of each person whose place of abode on June 1, 1900, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on June 1, 1900. Omit children born since June 1, 1900.	RELATION. Relationship of each person to the head of the family.	PERSONAL DESCRIPTION. Color or race.	Sex.	DATE OF BIRTH. Month.	Year.	Age at last birthday.	Whether single, married, widowed, or divorced.	NATIVITY. Place of birth of each person and parents of each person enumerated. If born in the United States, give the State or Territory; if of foreign birth, give the Country only. Place of birth of this Person.	Place of birth of Father of this person.	Place of birth of Mother of this person.	CITIZENSHIP. Year of immigration to the United States.	Number of years in the United States.	Naturalization.	OCCUPATION, TRADE, OR PROFESSION of each person TEN YEARS of age and over. Occupation.	Months not employed.
	3	4	5	6	7		8	9	13	14	15	16	17	18	19	20
72	Morgan William	Head	W	m	Feb	1847	53	m	Wales	Wales	Wales	1889	11	na	Coal Miner	6
73	Sarah J.	wife	W	F	Mar	1847	53	m	Wales	Wales	Wales	1889	11			
74	Mary A.	daughter	W	F	May	1870	30	m	Wales	Wales	Wales	1889	11			
75	Caroline	Daughter	W	F	Aug	1877	22	m	Wales	Wales	Wales	1889	11			
76	Alexander James	Son in Law	W	m	Oct	1879	20	m	Wales	Wales	Wales	1893	7		Coal Miner	6
77	Elizabeth James	Boarder	W	m	Oct	1860	39	S	England	England	England	1892	6		Coal mine Laborer	6

Alexander James in 1910

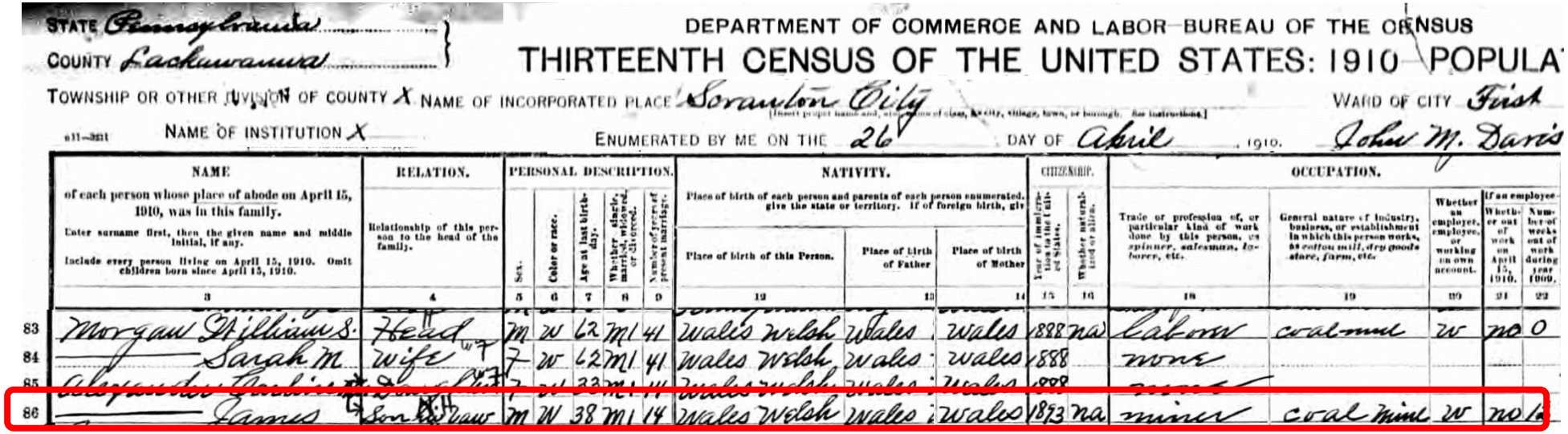


STATE Pennsylvania
COUNTY Lackawanna
DEPARTMENT OF COMMERCE AND LABOR—BUREAU OF THE CENSUS
THIRTEENTH CENSUS OF THE UNITED STATES: 1910 POPULA
TOWNSHIP OR OTHER DIVISION OF COUNTY X NAME OF INCORPORATED PLACE Scranton City
WARD OF CITY First
NAME OF INSTITUTION X
ENUMERATED BY ME ON THE 26 DAY OF April 1910. John M. Davis

	NAME of each person whose place of abode on April 15, 1910, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on April 15, 1910. Omit children born since April 15, 1910.	RELATION. Relationship of this person to the head of the family.	PERSONAL DESCRIPTION. Sex.	Color or race.	Age at last birthday.	Whether single, married, widowed, or divorced.	Number of years of present marriage.	NATIVITY. Place of birth of each person and parents of each person enumerated, give the state or territory. If of foreign birth, give Place of birth of this Person.	Place of birth of Father	Place of birth of Mother	CITIZENSHIP. Year of immigration to the United States.	Whether naturalized or alien.	OCCUPATION. Trade or profession of, or particular kind of work done by this person, as spinner, salesman, laborer, etc.	General nature of industry, business, or establishment in which this person works, as cotton mill, dry goods store, farm, etc.	Whether an employer, employee, or working on own account.	If an employee— Whether out of work on April 15, 1910.	Number of weeks out of work during year 1909.
	3	4	5	6	7	8	9	12	13	14	15	16	18	19	20	21	22
83	Morgan William S.	Head	M	W	62	M	41	Wales Welsh	Wales	Wales	1888	na	Laborer	coal mine	W	no	0
84	Sarah M.	wife	F	W	62	M	41	Wales Welsh	Wales	Wales	1888		none				
85	Alexander Gabriel	Son	M	W	33	M	11	Wales Welsh	Wales	Wales	1888		none				
86	James	Son in law	M	W	38	M	14	Wales Welsh	Wales	Wales	1873	na	miner	coal mine	W	no	12

- Nice and simple?

Alexander James in 1910



STATE Pennsylvania
COUNTY Lackawanna
DEPARTMENT OF COMMERCE AND LABOR—BUREAU OF THE CENSUS
THIRTEENTH CENSUS OF THE UNITED STATES: 1910 POPULA
TOWNSHIP OR OTHER DIVISION OF COUNTY X NAME OF INCORPORATED PLACE Scranton City
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NAME OF INSTITUTION X
ENUMERATED BY ME ON THE 26 DAY OF April 1910. John M. Davis

	NAME of each person whose place of abode on April 15, 1910, was in this family. Enter surname first, then the given name and middle initial, if any. Include every person living on April 15, 1910. Omit children born since April 15, 1910.	RELATION. Relationship of this person to the head of the family.	PERSONAL DESCRIPTION. Sex.	Color or race.	Age at last birthday.	Whether single, married, widowed, or divorced.	Number of years of present marriage.	NATIVITY. Place of birth of each person and parents of each person enumerated. If of foreign birth, give the state or territory. Place of birth of this Person.	Place of birth of Father	Place of birth of Mother	CITIZENSHIP. Year of immigration to the United States.	Whether naturalized or alien.	OCCUPATION. Trade or profession of, or particular kind of work done by this person, as spinner, salesman, laborer, etc.	General nature of industry, business, or establishment in which this person works, as cotton mill, dry goods store, farm, etc.	Whether an employer, employee, or working on own account.	If an employee: Whether out of work on April 15, 1910.	If an employee: Number of weeks out of work during year 1909.
	3	4	5	6	7	8	9	12	13	14	15	16	18	19	20	21	22
83	Morgan Williams	Head	M	W	62	M	41	Wales Welsh	Wales	Wales	1888	na	Laborer	coal mine	W	no	0
84	Sarah M	wife	F	W	62	M	41	Wales Welsh	Wales	Wales	1888		none				
85	Alexander [illegible]	Son	M	W	29	M	14	Wales Welsh	Wales	Wales	1888		none				
86	James	Son in law	M	W	38	M	14	Wales Welsh	Wales	Wales	1873	na	miner	coal mine	W	no	12

- Nice and simple?
- What if…
  - there are 20 more Alexander James's from Wales with the same age?
  - there is another 29 years old Alexander?
  - How about another Alexander *Jmaes* or Alex James?

Linking is inevitably imperfect

- Lots of things can go wrong
  - We can only link men, cannot link people with common names, so low match rates
  - Enumeration error, transcription error, mortality, return migration, under-enumeration between Census years, and people with same attributes make it impossible to know the correct match with certainty

- We face a trade-off
  - Erroneously deeming two unrelated records as a match (Type I error)
  - Erroneously neglecting true matches (Type II error)

- We are constantly working on improving our matching algorithms, using automated and machine learning approaches.

Abramitzky, Boustan, Eriksson, Feigenbaum, Perez (JEL 2021)

Two general ways to link

1. Linking by hand (Bailey et al. 2020):
   - Advantage:

     We humans trust other humans, expert genealogists can do better job than any computer wholistically
   - Disadvantages:

     Expensive; non replicable; impossible to search for a single record in a census without some use of automated algorithms

2. Linking using automated algorithms:
   - Advantages:

     Rule based, cheap, replicable, can compare any two records
   - Disadvantage:

     Hard to match the holistic similarity of different names that humans perform based on experience

What goals should a linking method achieve?

1. A method should be accurate, making as few false matches as possible (minimize type I errors)
2. It should be efficient, creating as many of the true matches as possible (minimize type II errors)
3. It should be representative, generating linked samples that resemble the population of interest as closely as possible
4. It should be feasible for most scholars to implement given current limitations of computing power and resources

Evaluating 3 widely used automated linking methods

1. **Abramitzky-Boustan-Eriksson (ABE)** (similar spirit to **Ferrie**):
   I. Using exact names/NYIIS adjusted/Jaro-Winkler distance
   II. With or without requiring uniqueness within 5 year band

2. **Expectation Maximization (EM):** combining age and name distance into a single score reflecting the probability that each two records are a true match (Abramitzky, Mill, and Perez 2018)

3. **Machine Learning (ML):** train an algorithm with data linked by hand to make matches like a human RA, using various record features (Feigenbaum 2016)

Automated algorithms perform well, but please use judgement

- Links made with standard automated methods agree more than 95% of the time with hand links made by users of the genealogical FamilySearch Tree
- Hand linking using *standard variables (name, age, place of birth)* perform no better than automated algorithms
- The automated methods trace out a frontier illustrating the trade-off between the false positive rate and the (true) match rate
  - It is possible to use automated methods to generate samples with low rates of false positives
  - The choice of linking algorithm has relatively little effect on inference (but please test!)
- Using extra variables (occupation, county of residence) reduce false positives, but introduce "selection on dependent variable" issue and reduce representativeness

Advice to researchers using linked historical data

- Create alternative samples using various automated methods (and their intersections) and test the robustness of results across samples
  - Automated methods may not work as well for specific groups and periods in which names are severely misspelled or otherwise do not lend themselves for a computer algorithm to decode
  - Whenever high-quality hand linked data can be created, the researcher should use them as well (Bailey et al. 2020)
- Reweight the sample to match the population on observable characteristics (Perez 2017, Zimran 2019, Bailey et al. 2020)
- Use judgement and knowledge to determine in the context of your research:
  - Which method is preferred in their context (and test robustness)
  - Whether using extra endogenous variables for linking is more beneficial (fewer false positives) or more problematic (selection on endogenous variable)

Census Linking Project

Home About Data Methods Who We Are Contact

The Census Linking Project offers researchers the ability to create longitudinal datasets using historical US Census data (1850-1940). We provide links between each pair of complete-count Censuses using a wide variety of linking algorithms.

church street	420	Smith, Sharon	mother
		Jackie	daughter
		Tom	son
		Alfred	son
		Jackie	daughter
		Michael	son

Get the Data

Download the crosswalk files →

https://censuslinkingproject.org/

Creating linked historical data to bring new insights on the American Dream

- Back from linking detour ☺

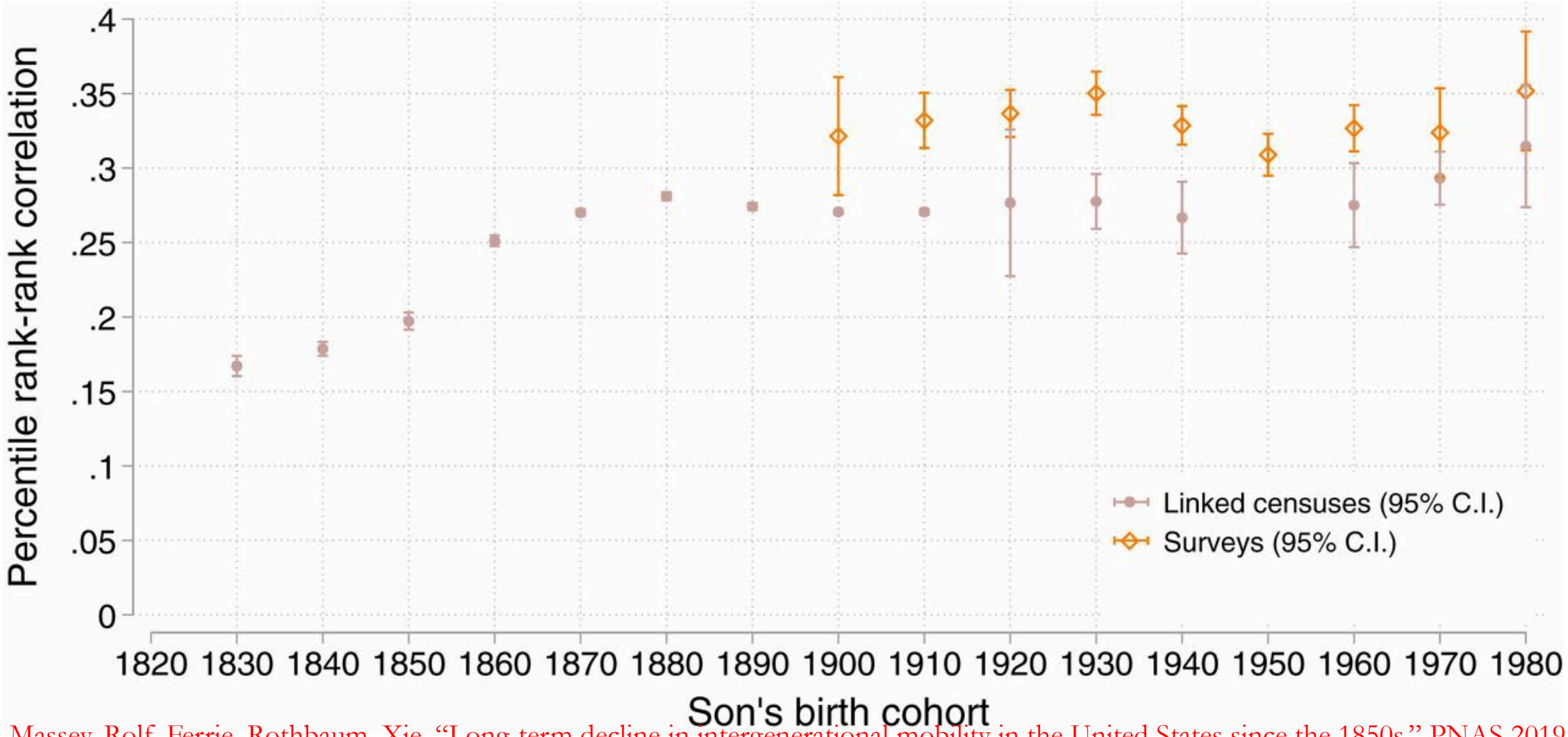
Insights from linked historical data on upward mobility

- The American dream of the past
  - High intergenerational mobility in the US before 1900 – higher than in UK. But:
  1. US was not really exceptional – Argentina had similar mobility rates
  2. Mobility in past is lower when including women and Black Americans in analysis

- The fading American dream
  - A decline in absolute and relative mobility since 1900
  - But decline mobility is slower than believed, because past mobility is exaggerated

- Mechanisms:
  - Internal migration played key role in explaining past mobility
  - Wealth shocks played a more limited role
  - The geography of opportunity is changing

Relative mobility: intergenerational mobility was high before 1900. Since then it declined, but more slowly than previously thought



Song, Massey, Rolf, Ferrie, Rothbaum, Xie, "Long-term decline in intergenerational mobility in the United States since the 1850s," PNAS 2019

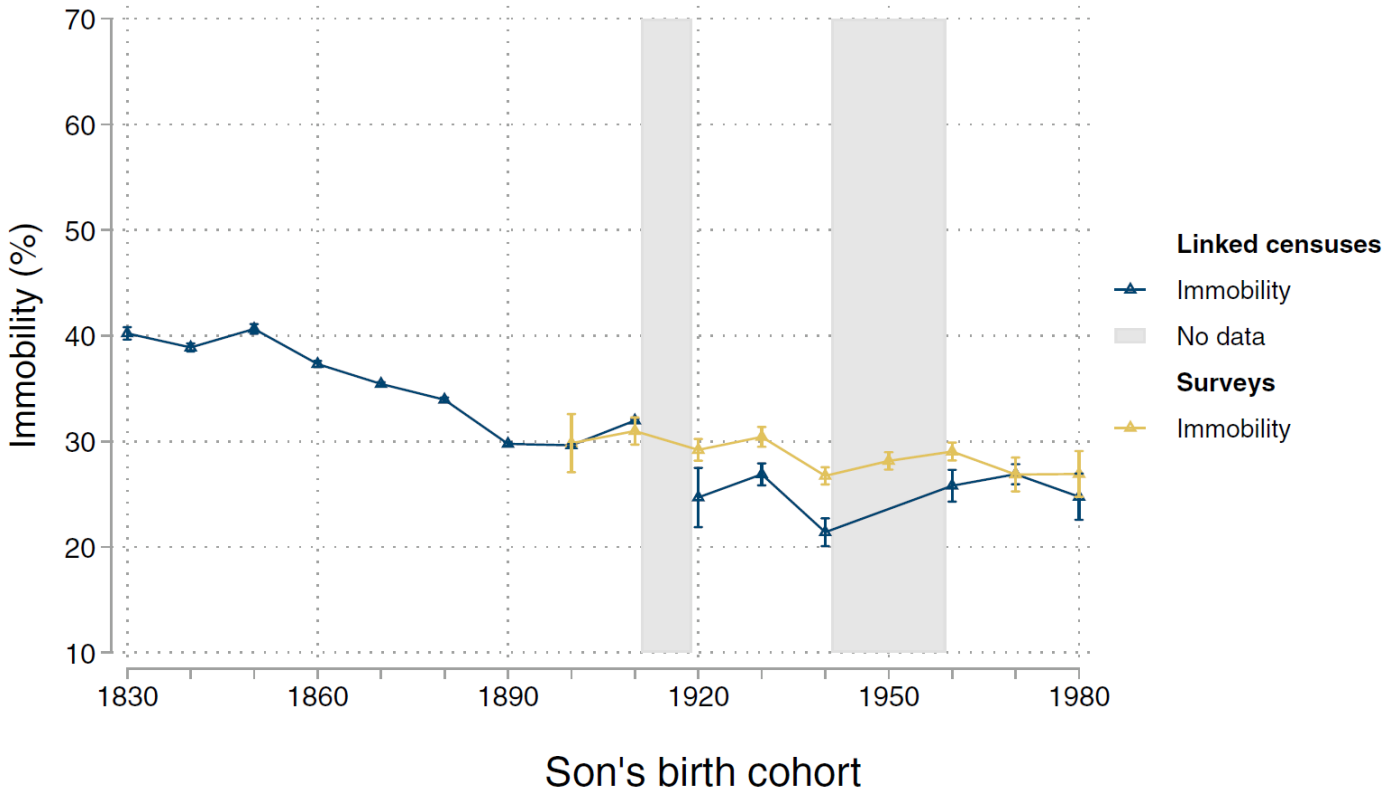
Absolute mobility: increased for birth cohorts born before 1900 and has fallen for those born after 1940

Proportion of son's birth cohort that experienced no intergenerational mobility:

declined for 1830-1900 cohorts

increased for 1940-1980 cohorts

Absolute mobility by son's birth cohort among the nonagricultural population



Income and education mobility were higher in early twentieth century than today

- Fathers from the Iowa State Census of 1915 linked to their sons in the 1940 Federal Census, the first state and federal censuses with data on income and years of education

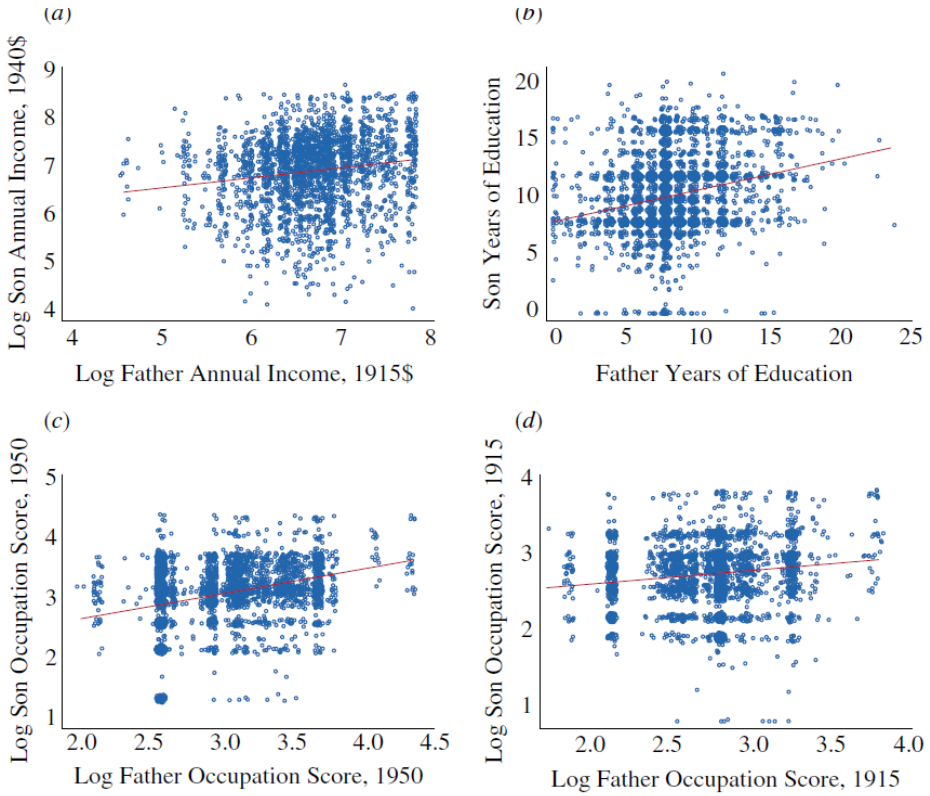


Fig. 3. *Intergenerational Mobility for Iowa 1915 to 1940. (a) Mobility of Income; (b) Mobility of Education; (c) Mobility of Occupation, 1950 Basis; (d) Mobility of Occupation, 1915 Basis*

high rates of mobility (relatively flat lines) across all measures

Feigenbaum James, "Multiple Measures of Historical Intergenerational Mobility: Iowa 1915 to 1940," *Economic Journal* (2018)

Intergenerational mobility of daughters

- Historical longitudinal datasets based on census data make it possible to link fathers and sons by first and last names
- However, one cannot link fathers and daughters in this manner because women change last name upon marriage
- Olivetti and Paserman (*AER* 2015) developed a creative way to estimate intergenerational elasticity between fathers and daughters (and between fathers and sons) even when impossible to link individuals directly across generations
- <u>The key insight:</u> the information about socioeconomic status conveyed by first names can be used to create a pseudo-link between fathers and sons, as well as between fathers and daughters

Olivetti Claudia and Daniele Paserman, "In the Name of the Son (and the Daughter): Intergenerational Mobility in the United States, 1850–1940," *AER* (2015)

Intergenerational mobility for daughters was also high until 1900

- Mobility was high until 1900, declined sharply between 1900-1920, and increased slightly afterwards
  - father-son and father-sons-in-laws elasticities increased sharply between 1900 and 1920, and declined afterwards

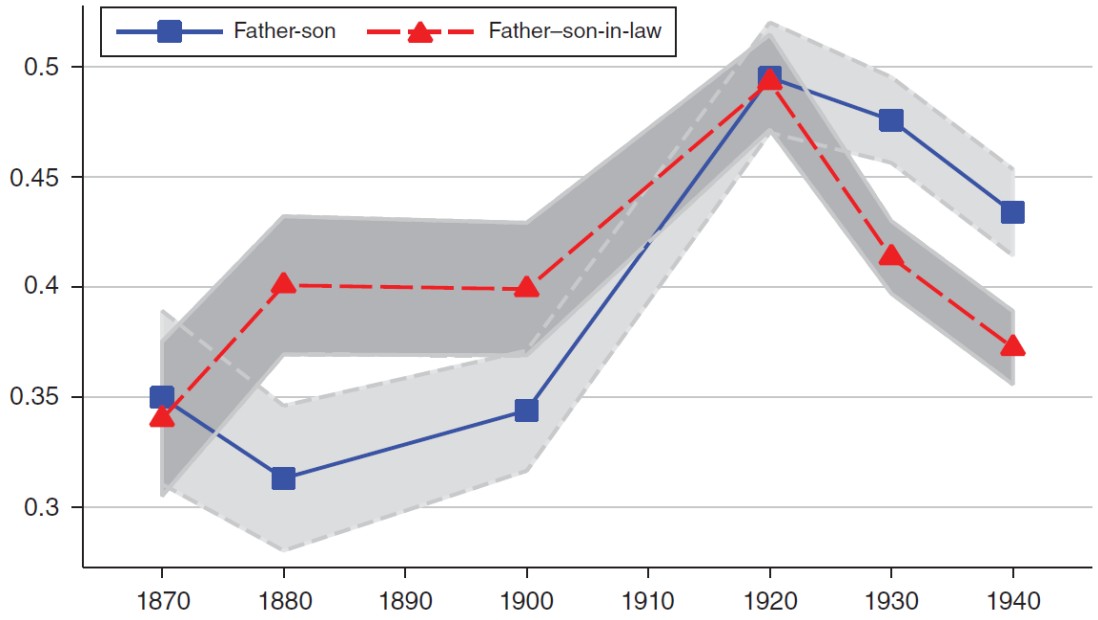


FIGURE 1. FATHER-SON AND FATHER–SON-IN-LAW ELASTICITIES IN OCCUPATIONAL INCOME, 1870–1940

Olivetti Claudia and Daniele Paserman, "In the Name of the Son (and the Daughter): Intergenerational Mobility in the United States, 1850–1940," *AER* (2015)

Was US *exceptionally* mobile?

- US had higher intergenerational occupational mobility than Britain in the second half of the 19th century (Long and Ferrie, 2007, 2013)
  - The US was more mobile than Britain through 1900

- The US mobility lead over Britain was erased by the 1950s, as US mobility fell from its nineteenth century levels

- In the experience of those who created the US welfare state in the 1930s, the US had indeed been "exceptional"

- But no real "American exceptionalism": Argentina had similar levels of intergenerational mobility as US, and both had higher mobility than Britain and Norway (Perez 2019, Modalsli 2017)

Excluding Black Americans overstates mobility throughout the 20th century

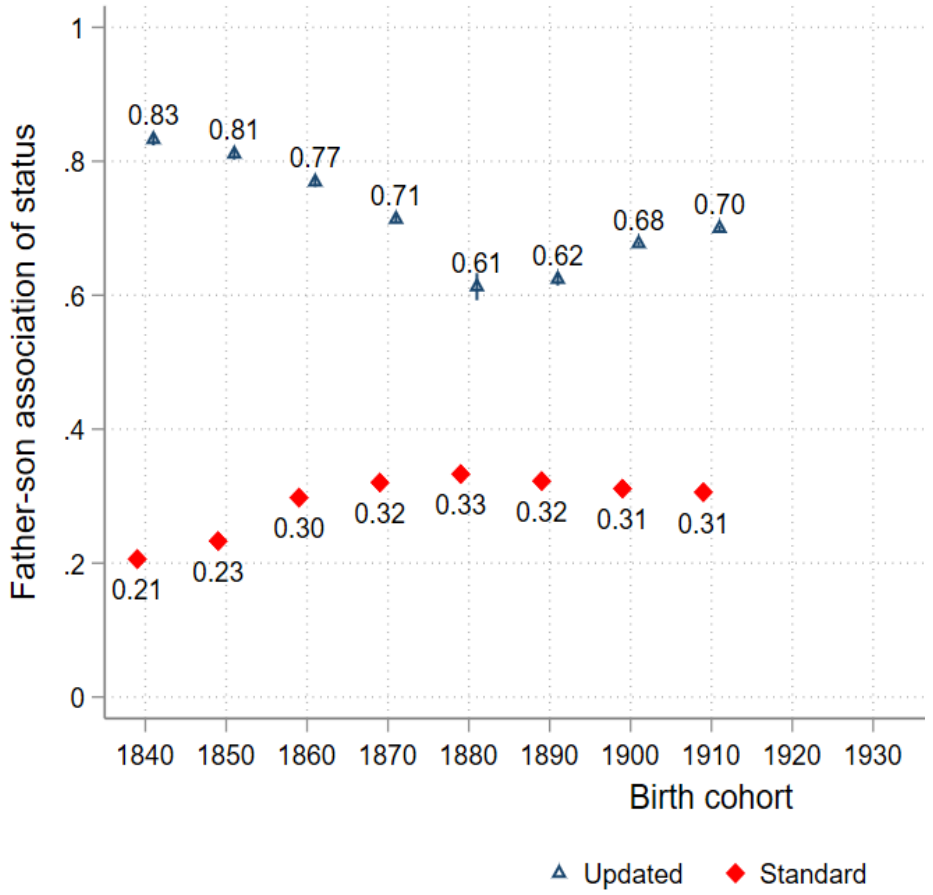
- Historical linked studies do not account for two measurement issues:

1. Racial disparities in upward mobility
   - Many historical linked studies have few or no Black families in the data
   - Discount a low upward mobility group → overstate equality of opportunity

2. Measurement error of father's economic status
   - One snapshot of the father is a poor proxy for lifetime outcomes
   - Measurement error → attenuation bias → lower persistence rates
   - One way to fix: multiple father observations, using Census Linking Project

Ward Zach, "Intergenerational Mobility in American History: Accounting for Race and Measurement Error," *AER* 2021

Mobility in the past was much lower than previously found

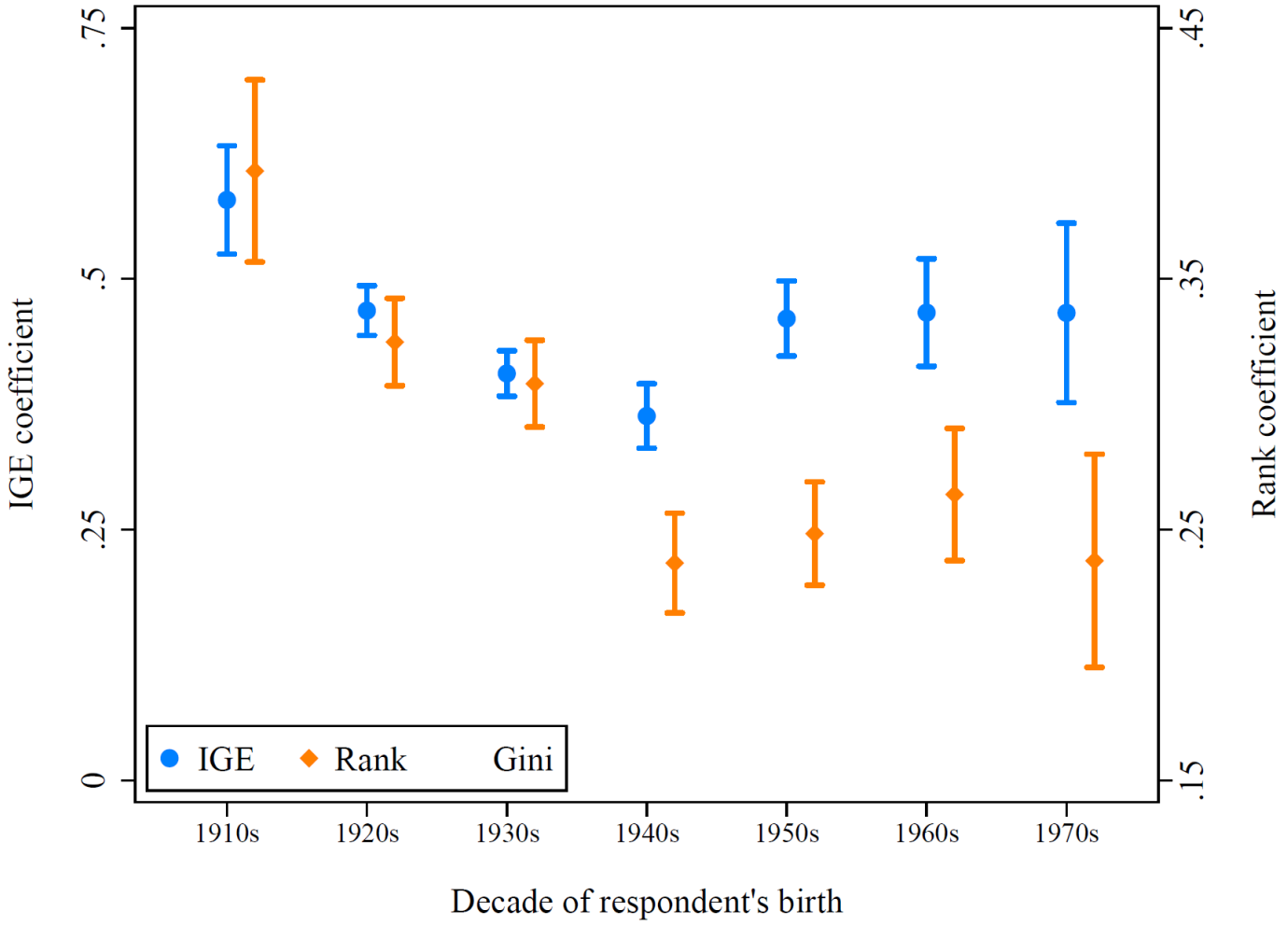


Ward Zach, "Intergenerational Mobility in American History: Accounting for Race and Measurement Error" 2021

Jacome, Kuziemko, and Naidu, "Mobility for All: Representative Intergenerational Mobility Estimates over the 20th Century," NBER (2021)

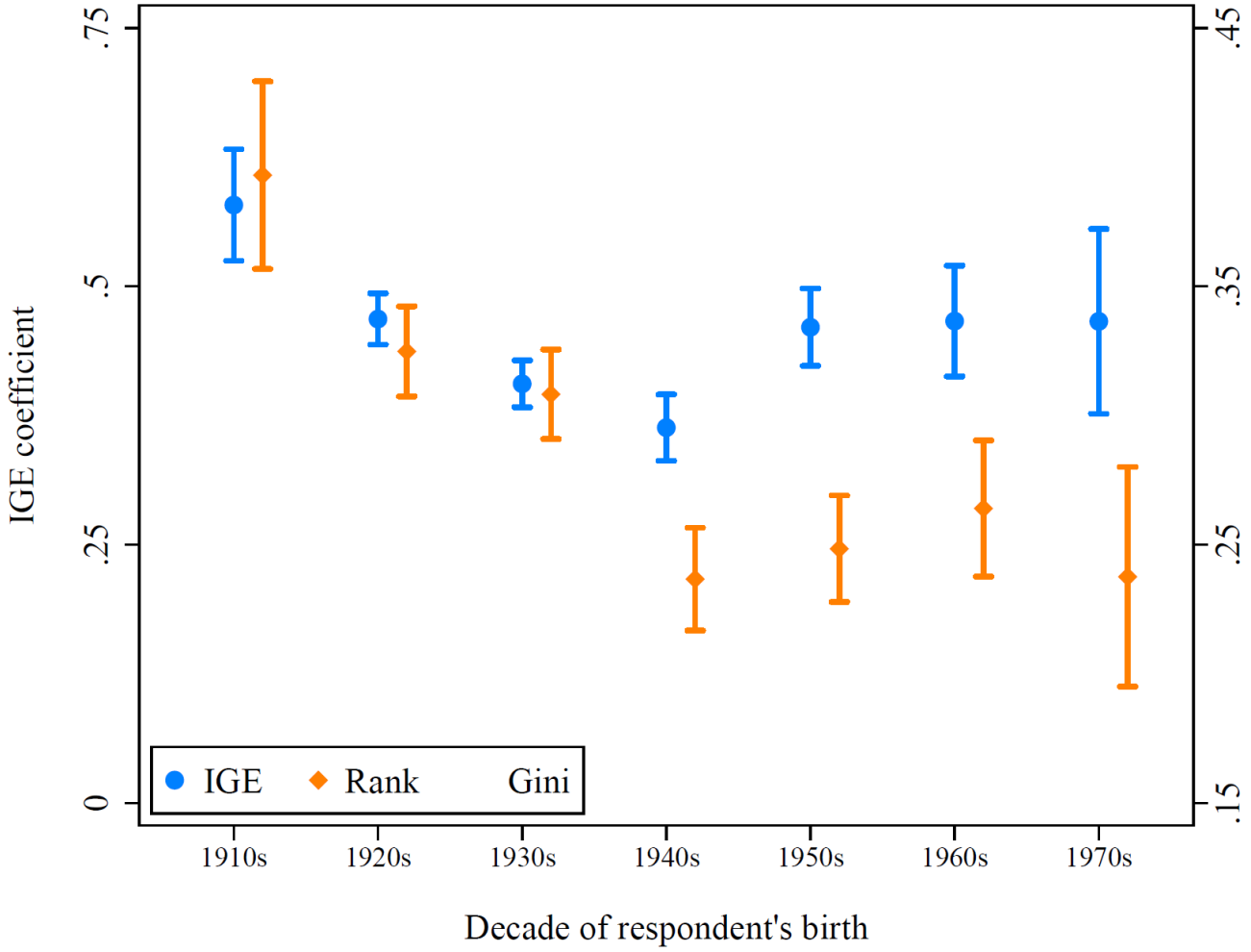
- Most work on long-run trends looks only at white men
- Women have been largely excluded for data reasons (changing names upon marriage makes them difficult to link over time)
- Black Americans have also been neglected due to data limitations
  - Even though the US is 85-90 white in most of our sample period, adding in non-whites makes a huge difference to mobility estimates
  - Because Black Americans historically occupy extremely low part of the parental-income distribution, changes in their income can have large effects on overall mobility
- Collect data on all surveys that ask about father occupation and family income
- Representative sample of all US-born individuals beginning in 1910

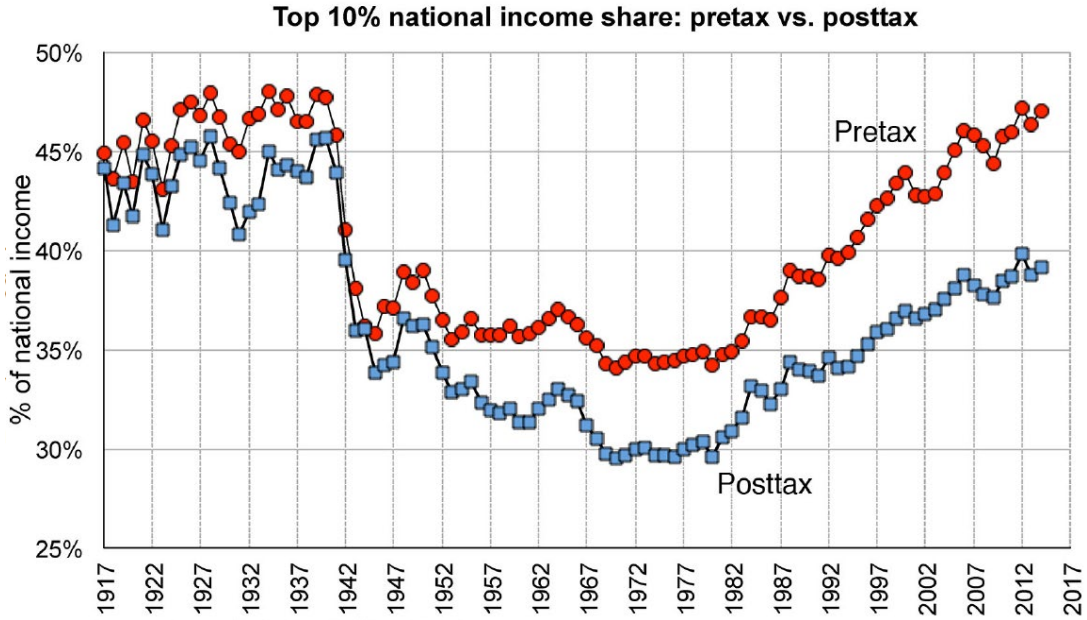
Overall mobility rose from 1910s to 1940s birth cohorts, but drifted back up afterwards



A decline in IGE elasticity implies an increase in intergenerational mobility

Overall mobility rose from 1910s to 1940s birth cohorts, but drifted back up afterwards (mirroring U-shape in inequality)

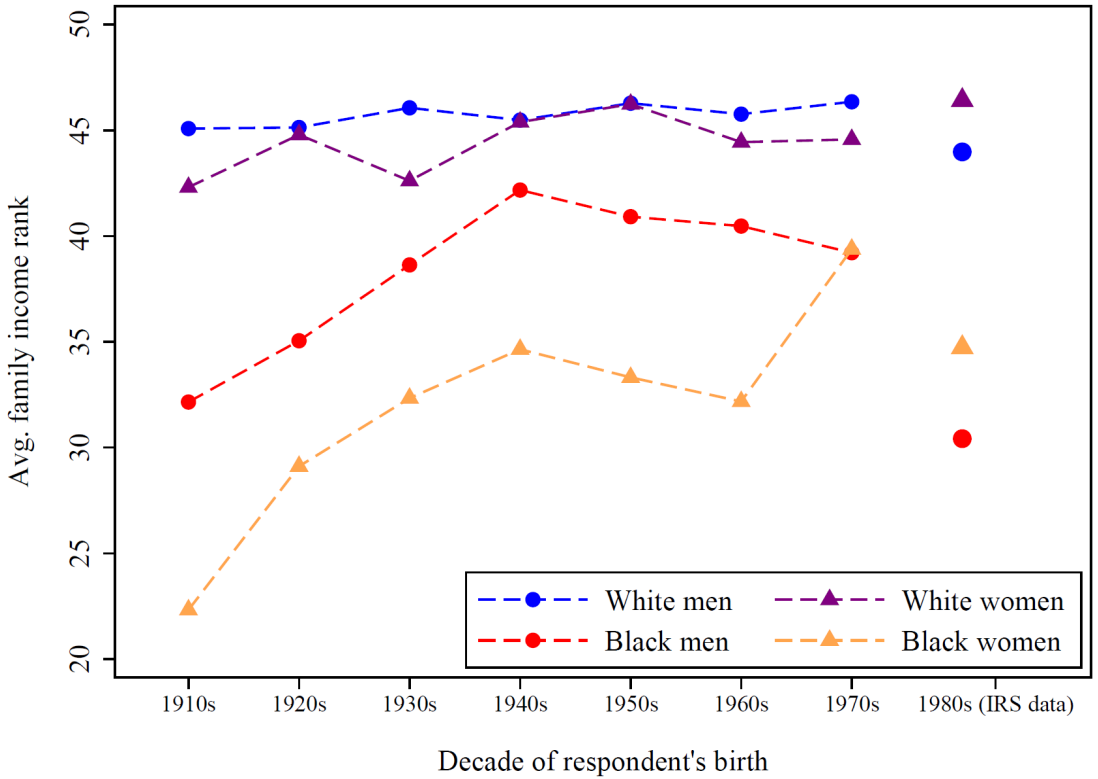




Piketty, Saez, and Zucman (2017)

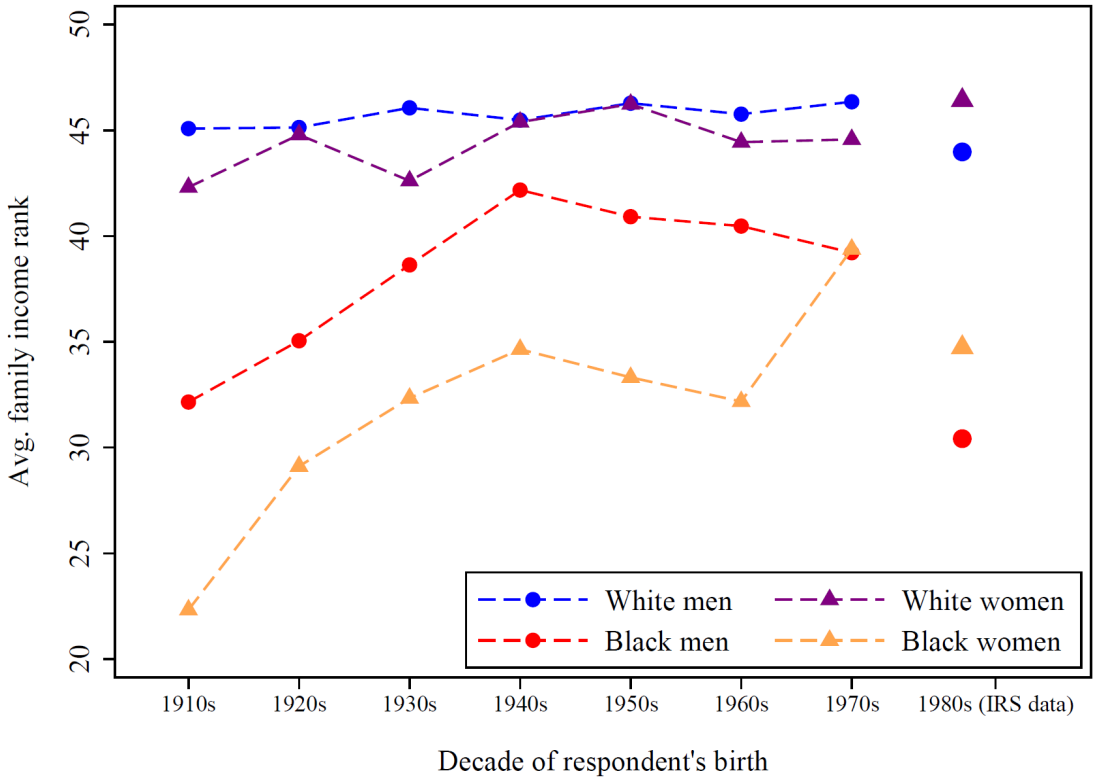
For birth cohorts throughout the 1960s, men growing up in relatively poor families are more upwardly mobile than women

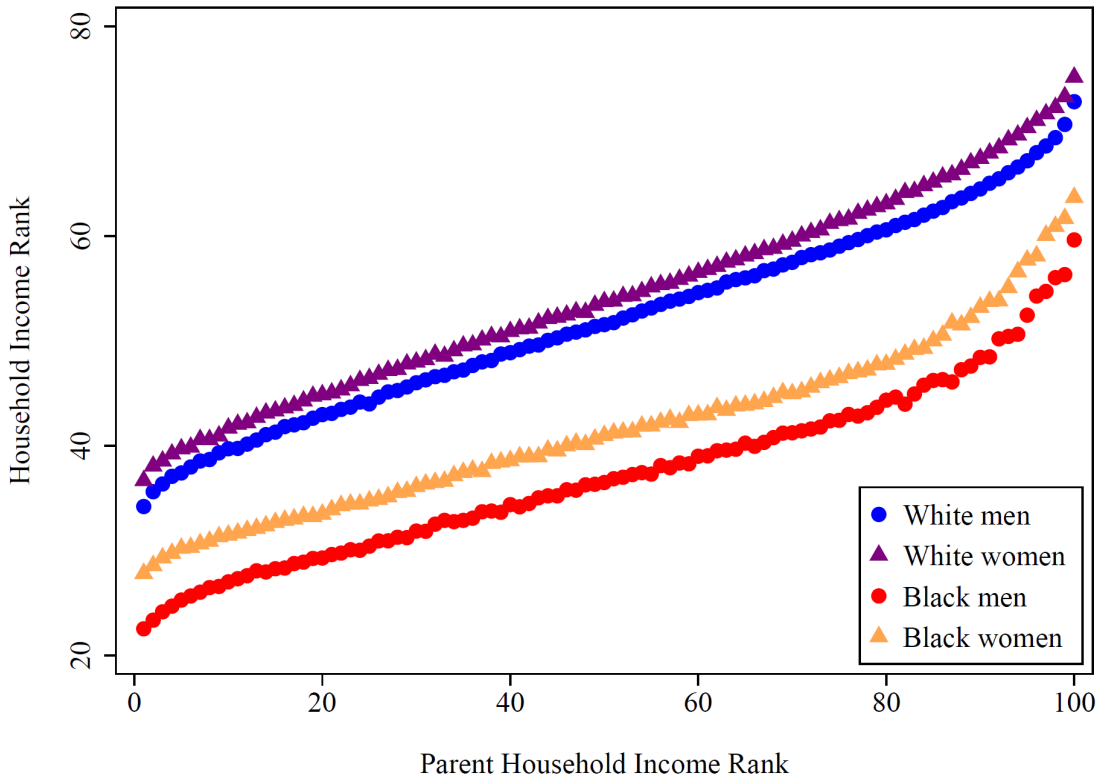
Predicted percentile for children growing up at the 25th percentile



In 1980 birth cohorts, women overtake men in adult family income, especially black women

Predicted percentile for children growing up at the 25th percentile





1980s cohorts (Chetty et al. 2020)

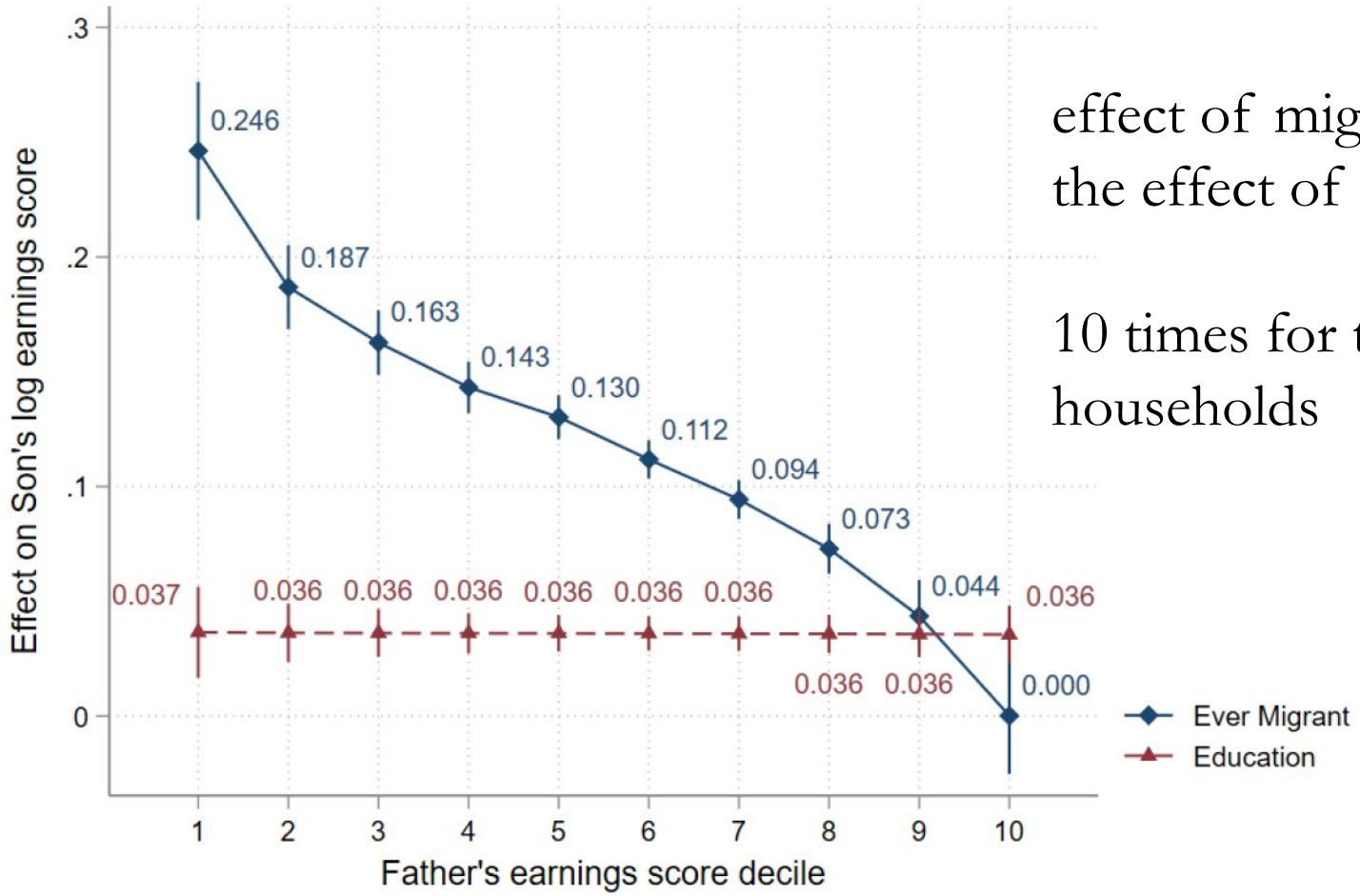
Lecture 10: Social mobility – lessons from history about mechanisms

Internal migration led to gains in economic status

- Using within-brother variation and linked dataset from the early 20th century
- Compares brothers who migrated by 1940 and those who didn't
- Unovservables that vary across brothers not controlled for, but:
    1. Pre-migration outcomes were similar for brothers who eventually migrated and those who never did
    2. Controlling for pre-migration occupations does not change within-brother estimates of the migration premium

Ward Zach, "Internal Migration, Education and Intergenerational Mobility: Evidence from American History," *JHR*, forthcoming

Internal migration was more effective than education for allowing children to escape poverty



effect of migration was 3-4 times the effect of 1 year of education

10 times for those raised in poorer households

Internal migration was a key strategy for moving upward in the economic distribution

- Especially for the poor

- In the context of rapid industrialization, large rural-to-urban flows, and wide interregional income gaps

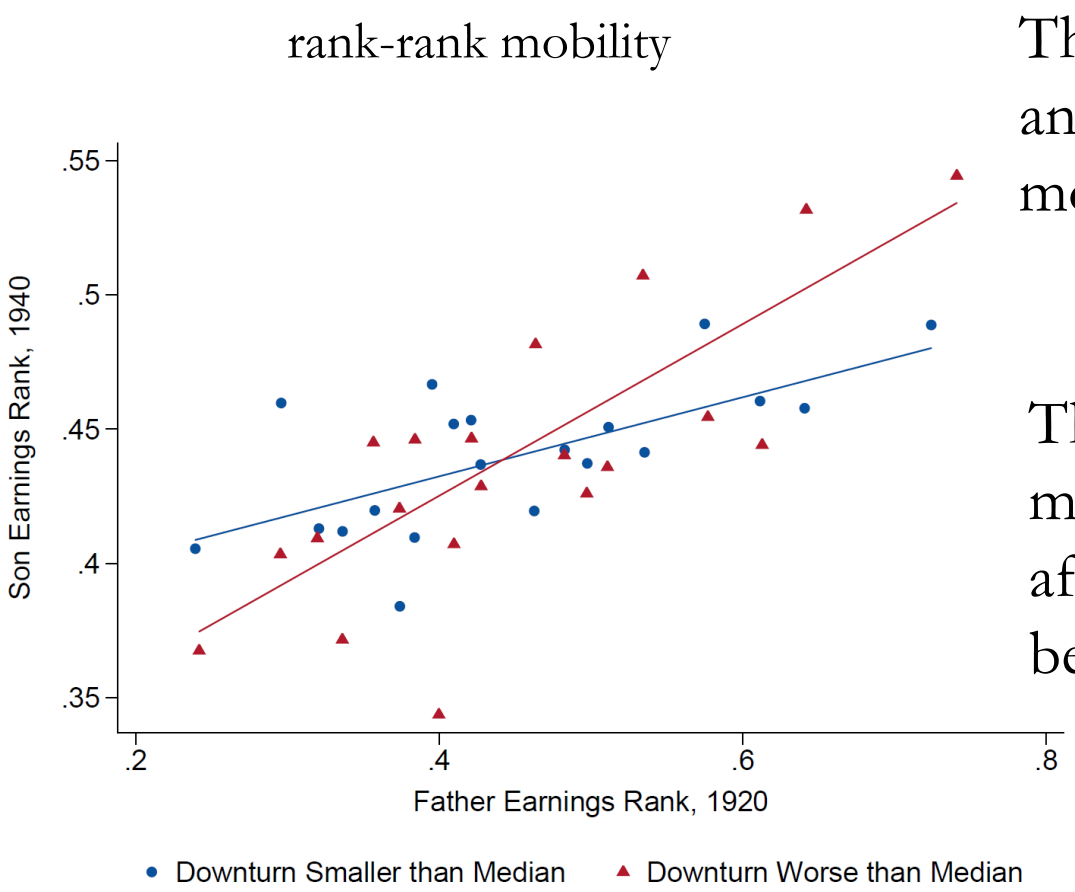
- Similar in 19th century England (Long 2005) and Argentina (Perez 2018)
  - rural-to-urban moves were important for upward mobility

Great depression lowered intergenerational mobility, because the rich migrated out of severely-hit cities

- Linking fathers and sons before and after the Great Depression
- Difference-in-differences framework: comparing sons in cities before and after the Depression that experienced Depression downturns of varying magnitudes
  - No pre-depression differences in mobility between cities that later experienced larger or smaller Depression downturns
- Severe economic downturns may increase intergenerational economic mobility (think compete destruction of income)
- But paper finds Great Depression lowered intergenerational mobility

Feigenbaum James, "Intergenerational Mobility during the Great Depression," working paper (2015)

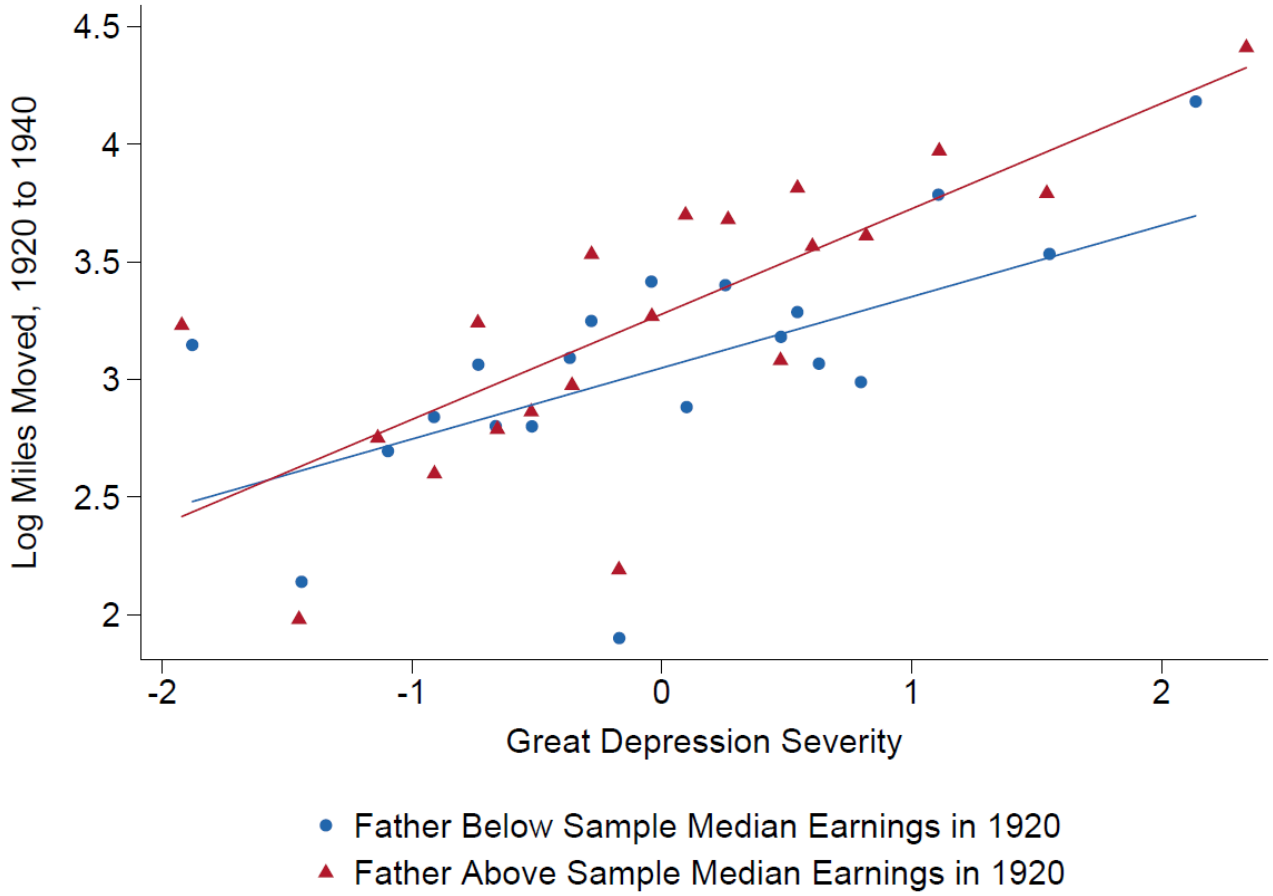
Intergenerational mobility of earnings is lower in cities with more severe Great Depression downturns



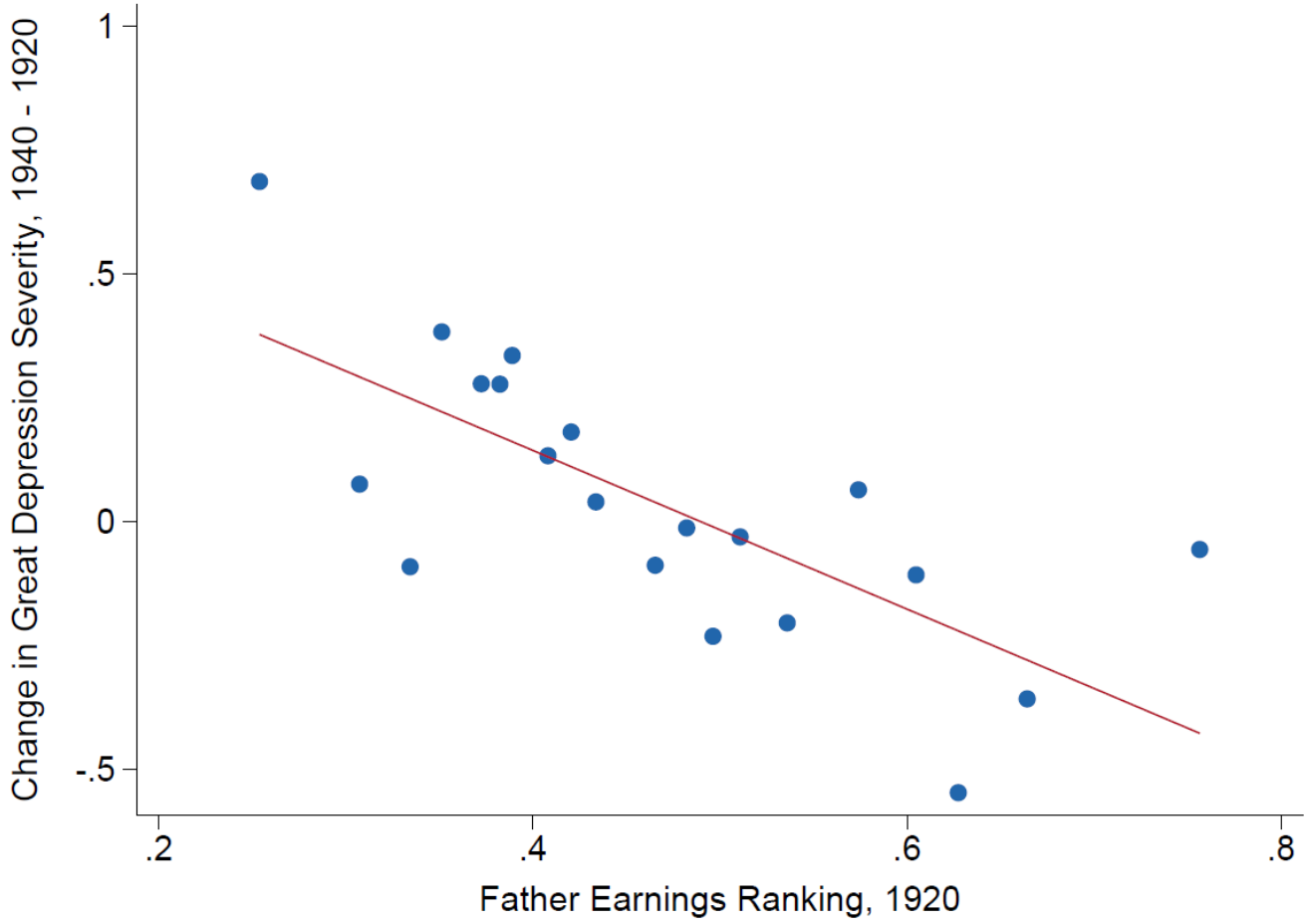
The steeper slope between the father's log earnings and son's log earnings in cities with downturns more severe than the median implies less mobility

The differences in rates of intergenerational mobility for sons in most and least Depression-affected cities are comparable to the differences between the US and Sweden today

Mechanism: sons in cities with more severe Depression downturns were more likely to move out of state



Sons of richer fathers moved to cities with less severe Depression downturns, increasing persistence in intergenerational mobility



Effects of wealth shocks on intergenerational mobility

- Does the lack of wealth constrain parents' investments in the human capital of their descendants?

- Models of the decision made by parents to invest in their children suggest that wealthier parents face a different budget constraint than poorer parents (e.g., Becker and Tomes 1986)

  - This results in a correlation in outcomes across generations

  - The loss of parental resources is expected to reduce investment in children, lowering wealth in the next generation

- Two studies that use "natural experiments" and linked historical data

1. Georgia's Cherokee Land Lottery of 1832

- Track (for 50 years) descendants of participants in the Land Lottery
  - winning one of more than 18,000 parcels of land in a large-scale lottery in the U.S. state of Georgia
  - nearly every adult white male in the state took part
- Winners received close to the median level of wealth—a large financial windfall orthogonal to participants' underlying characteristics that might have also affected their children's human capital

Bleakely and Ferrie, "Shocking Behavior: Random Wealth in Antebellum Georgia and Human Capital Across Generations," QJE (2016)

Lottery winners did not have better outcomes

- Although winners had slightly more children than did non winners, they did not send them to school more
- Sons of winners had no better adult outcomes (wealth, income, literacy) than sons of non-winners
- Winners' grandchildren do not have higher literacy or school attendance than non-winners' grandchildren
- These findings suggest:
  - that winners did not use their windfall to relax a financial resource constraint on human capital investment in their children
  - only a limited role for family financial resources in the formation of human capital in the next generations in this context
  - potentially more important role for other factors that persist through family lines

2. The nullification of slave wealth after the U.S. Civil War (1861-65)

- One of the largest episodes of wealth compressions in history
- Start with slaveowners in 1860 (eve of the war). Link their children and grandchildren to 1900 and 1940
- Research strategy: compare slaveholding households that held equal amounts of total wealth in 1860 but owned different numbers of slaves
  - All men in sample owned at least one slave, so compare households with same wealth levels in 1860 who owned more/fewer slaves

$$Y_{isp} = \alpha_s + \eta_p + \mathbf{1}(SLAVE\_COUNT1860_i)\,\Pi + X_i\Theta + \varepsilon_{isp}$$

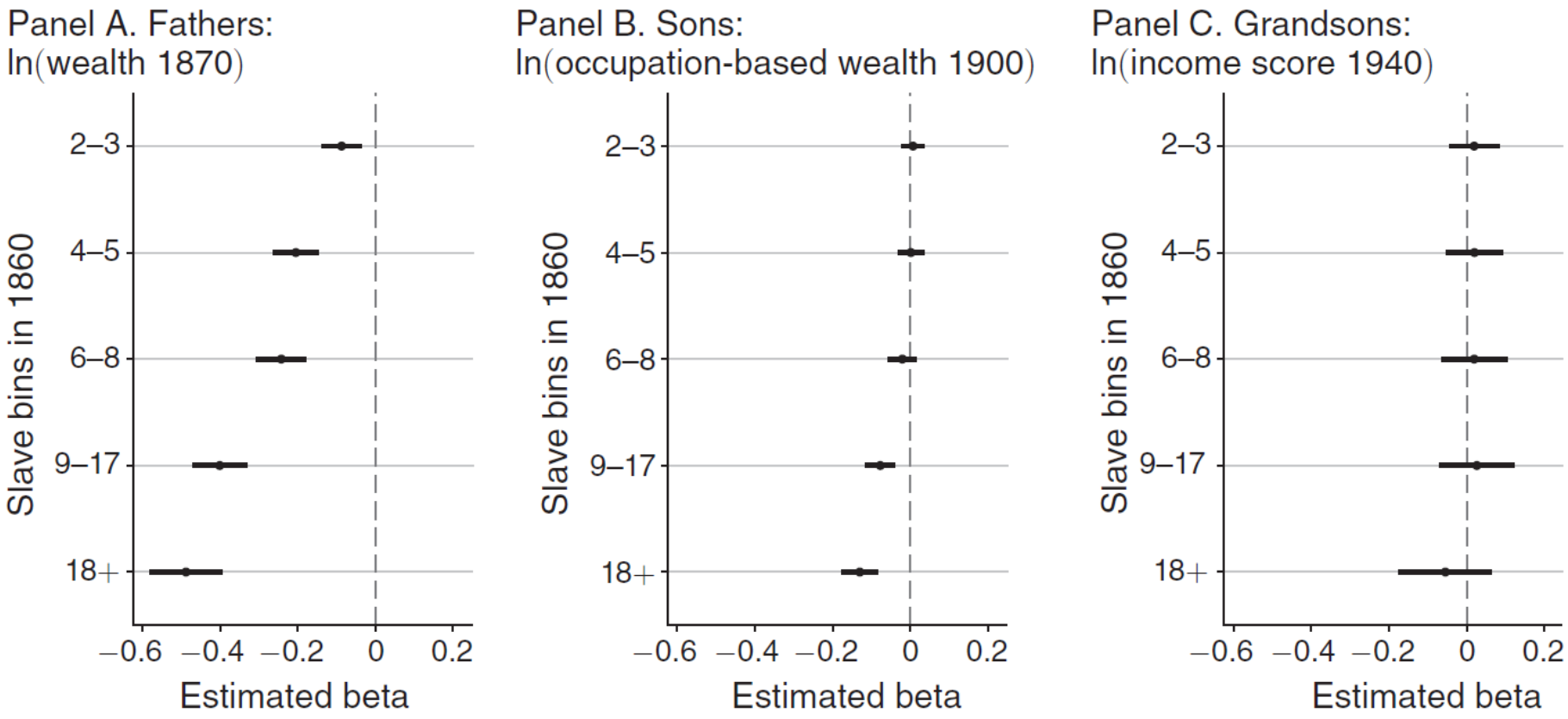
household *i*, living in state *s* in 1860, in wealth percentile *p*

ηp : set of dummy variables for exact percentile in the 1860 wealth

1(SLAVE_COUNT1860): indicators for numbers of slaves owned in 1860

As : state fixed effects

Ager, Philipp, Leah Boustan, and Katherine Eriksson, "The Intergenerational Effects of a Large Wealth Shock: White Southerners After the Civil War," *American Economic Review* (2021)



White Southern households holding more slave assets in 1860 lost substantially more wealth by 1870, relative to households that had been equally wealthy before the war

Yet, the sons of former slaveholders recovered relative to comparable sons by 1900, and grandsons converged to their counterparts in income by 1940

The families of slaveholders regained their relative economic status in the South within a generation, despite significant losses of monetary resources

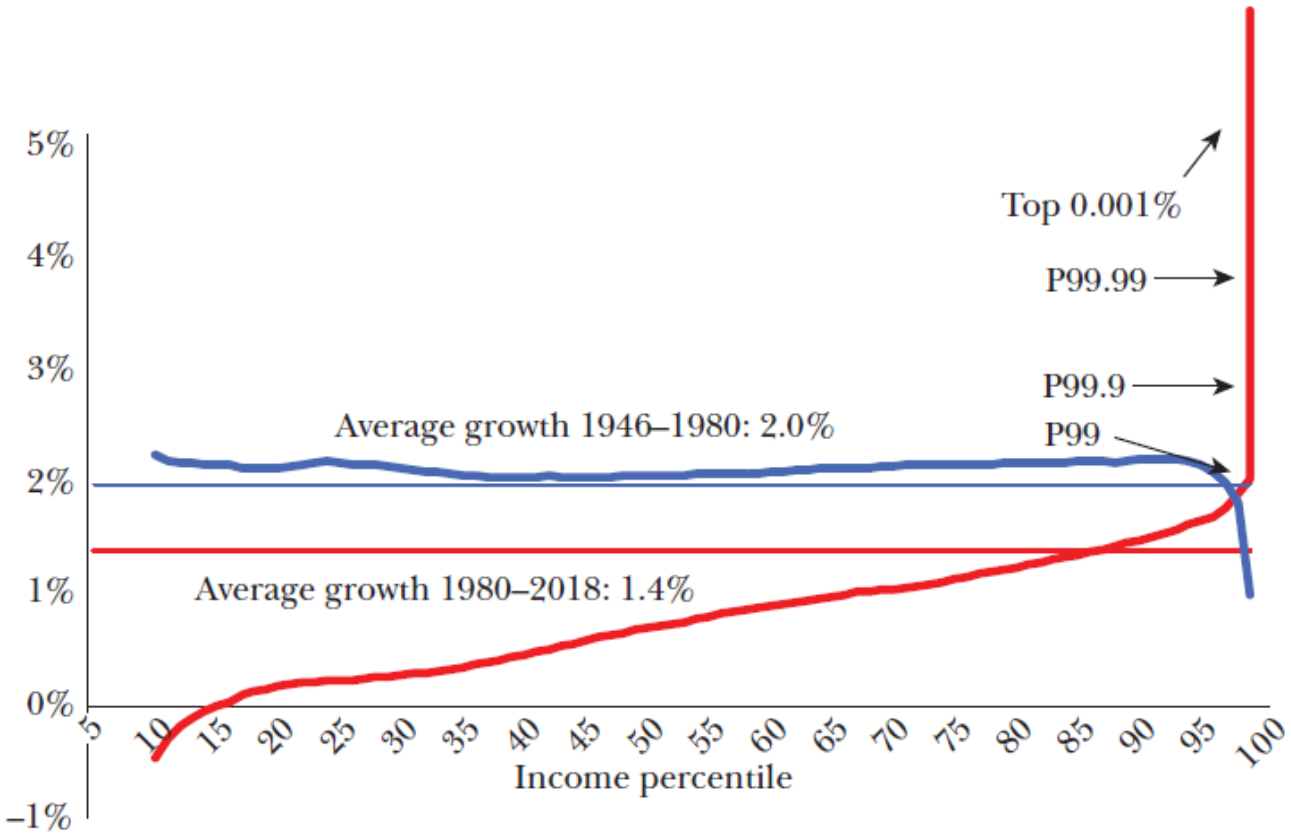
- Emancipation resulted in the loss of material resources, without disrupting other potential advantages, such as specific skills and training, social networks or political connections (consistent with Bleakley and Ferrie 2016)

- Mechanisms: authors conclude that inherited ability, entrepreneurial skills, or specific human capital are unlikely to explain the recovery of slaveholders' sons. Instead, slaveholder sons used social networks to aid their recovery

- War may be a "great leveler" that reshapes wealth distribution in the short term (Scheidel 2017), but, in this context, established families were able to quickly return to prominence in peacetime

Why have absolute upward mobility declined since 1940?

Average Annual Income Growth Rates



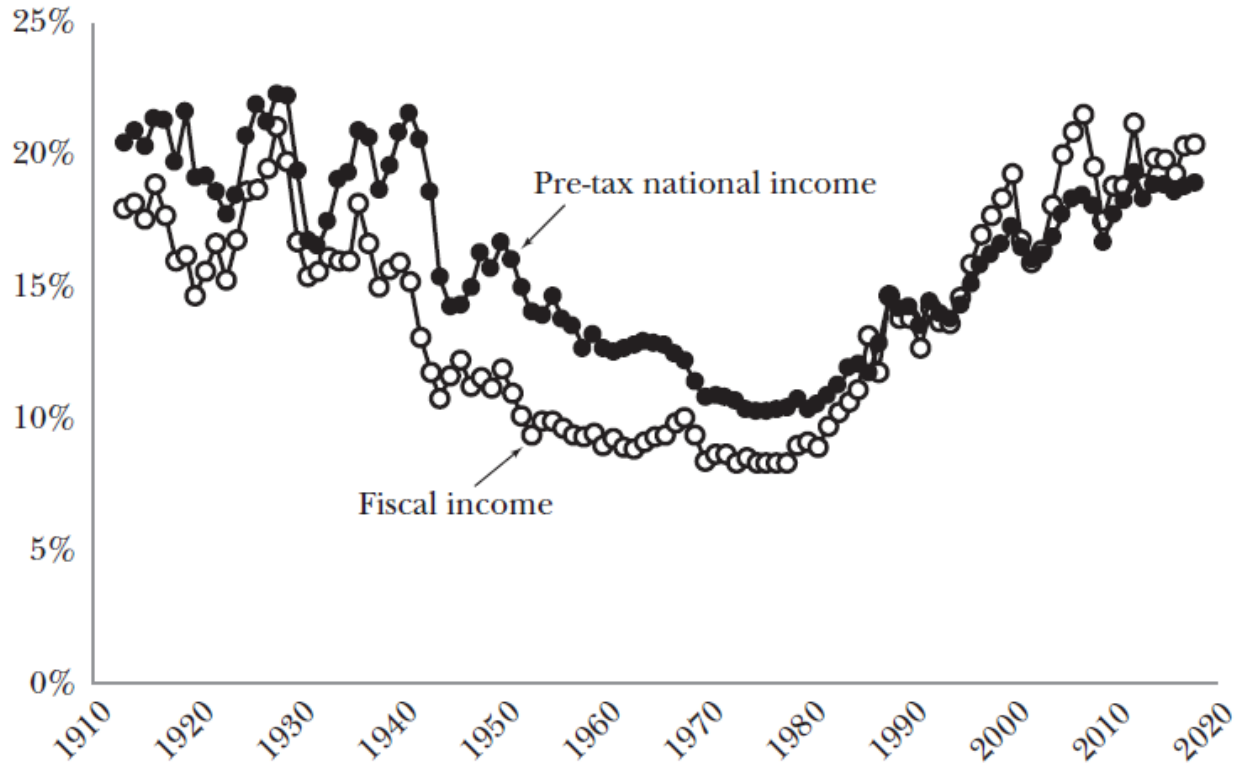
Two big changes over last 50 years:

1. lower growth rates
2. growing inequality (less equal distribution of growth)

Saez and Zucman, "The Rise of Income and Wealth Inequality in America: Evidence from Distributional Macroeconomic Accounts," JEP (2020)

Figure 3

Share of Income Earned by the Top 1 Percent



Note: This figure compares the share of fiscal income earned by the top 1 percent tax units (from Piketty and Saez 2003, updated series including capital gains in income to compute shares but not to define ranks, to smooth the lumpiness of realized capital gains) to the share of pre-tax national income earned by the top 1 percent equal-split adults (from Piketty, Saez, and Zucman 2018, updated September 2020, available on WID.world).

Saez and Zucman (2020) updating Piketty and Saez (2003)

Why have absolute upward mobility declined since 1940?

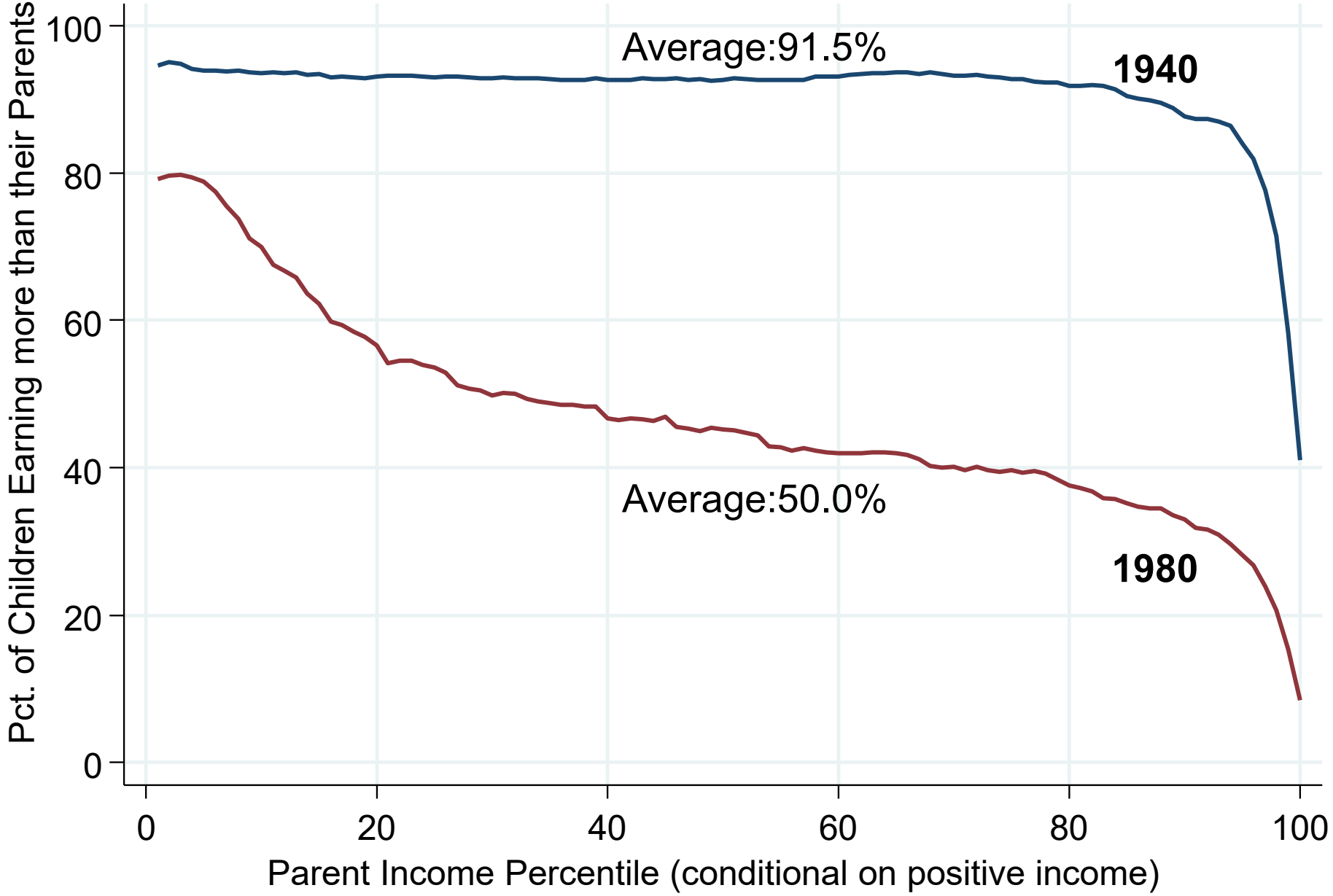
- Chetty et al. consider two hypothetical scenarios for children born in 1980:

- **Higher growth**: growth rate since birth corresponding to 1940 cohort, with income distributed as it is today

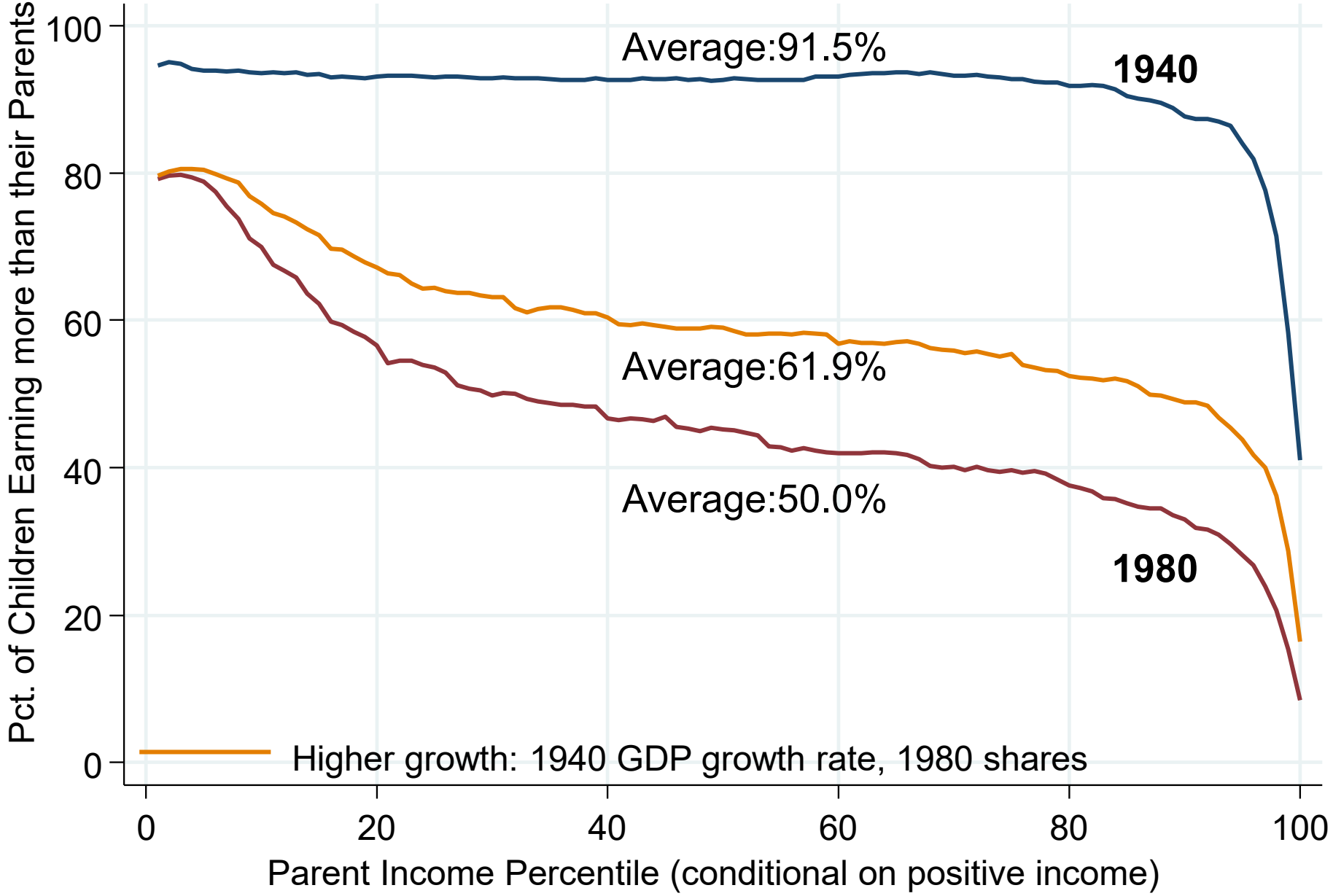
- **More broadly shared growth**: same growth rates as today, but distributed across income groups as in 1940 cohort

Source: Chetty, Grusky, Hell, Hendren, Manduca, Narang (Science 2017)

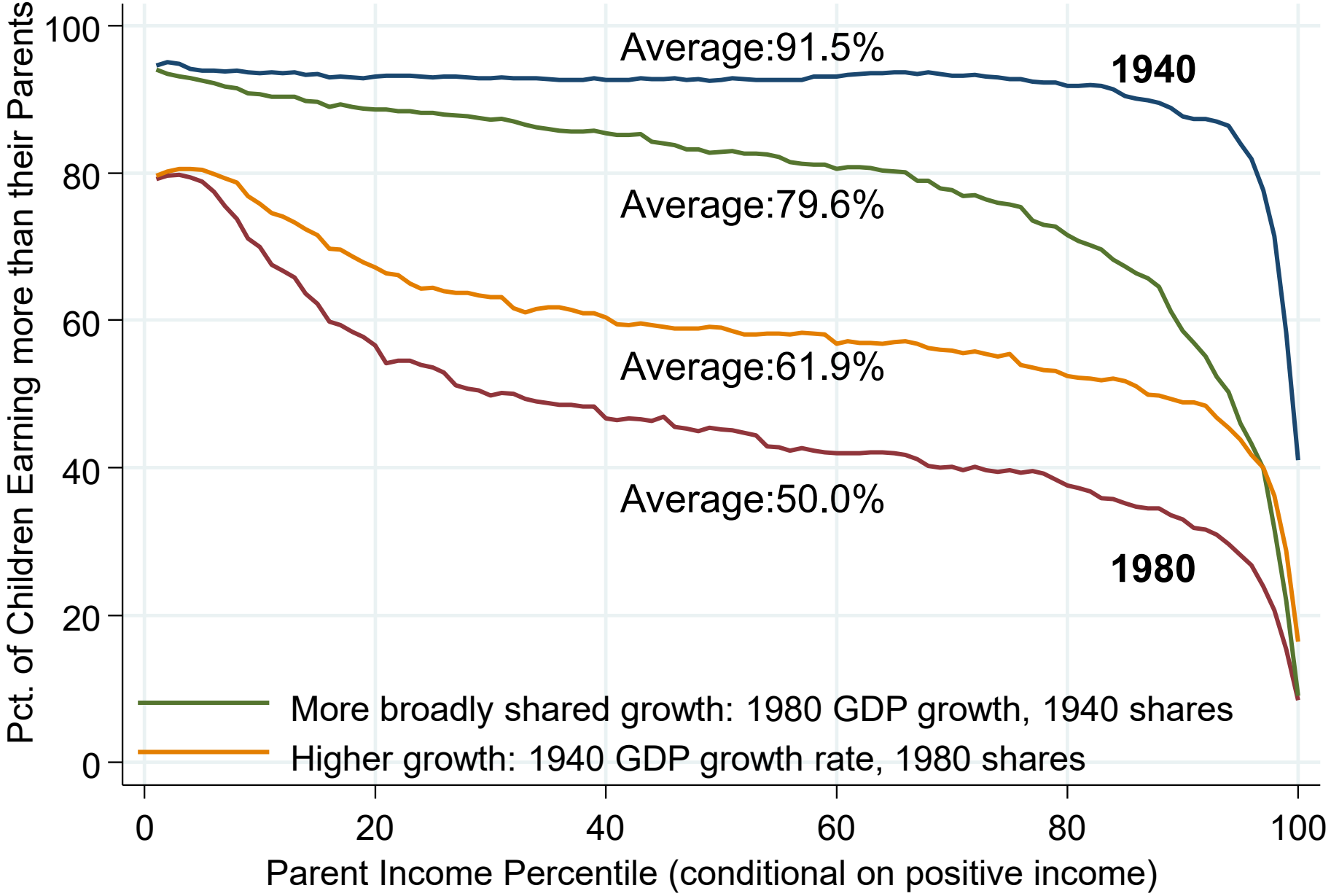
Percent of Children Earning More than Their Parents: Hypothetical Scenarios



Percent of Children Earning More than Their Parents: Hypothetical Scenarios



Percent of Children Earning More than Their Parents: Hypothetical Scenarios



Restoring the American Dream

- Chetty et al's conclusion: "restoring the American Dream of high rates of upward mobility will require more broadly shared economic growth"
- Need policies that will increase incomes in the bottom and middle of the income distribution
- Two broad approaches: redistribution (taxes/transfers, min wages) or increasing skills of lower-income Americans ("human capital")

Source: Chetty, Grusky, Hell, Hendren, Manduca, Narang (Science 2017)

Restoring the American Dream – historical perspective

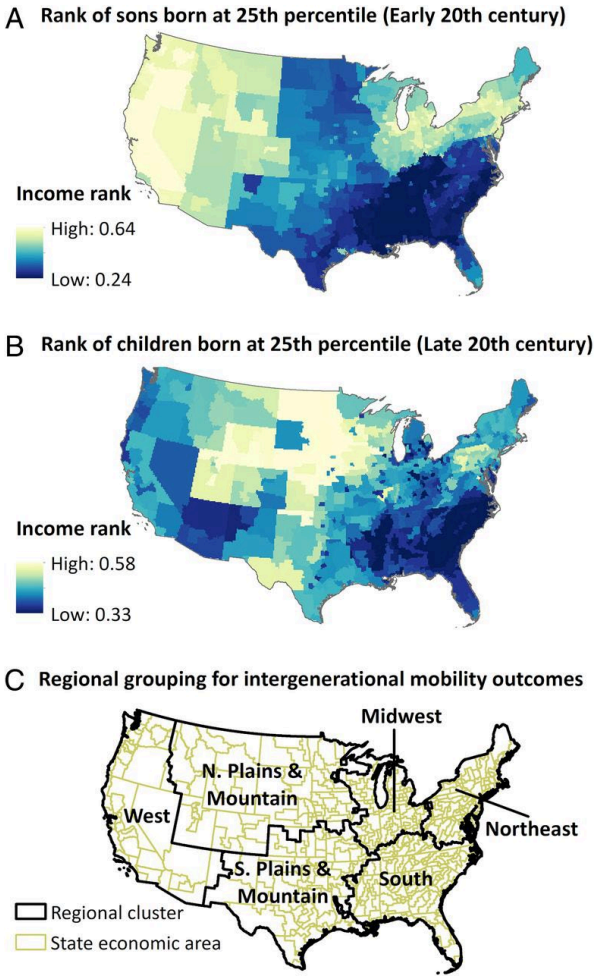
- Redistribution: reductions in top income taxes and erosion of unions and minimum wages have led working-class Americans to fall behind (Piketty, Saez, Zucman)

- Education: race between education and technology – need education to keep pace with technological change to increase wage rates (Goldin and Katz)

    - Policies to improve such skills: changes in education and training programs, housing voucher policies

Deeper roots vs changing circumstances

The changing geography of social mobility in the United States



past: Linked historical census records

present: Opportunity Insight

sharp decline in social mobility in the Midwest as economic activity has shifted away from it (changing circumstances)

consistently low levels of opportunity in the South even as economic activity has shifted toward it (deep roots)

Connor and Storper, "The changing geography of social mobility in the United States" (PNAS 2020)

Insights from linked historical data on upward mobility

- The fading American dream
  - A decline in absolute and relative mobility since 1900
  - But decline mobility is slower than believed, because past mobility is exaggerated
  - Decline in mobility is associated with rise in income inequality

- Lessons from past about mechanisms:
  - Internal migration played key role in explaining past mobility
  - Wealth shocks played a more limited role
  - The geography of opportunity is changing