Public Economics: Lecture 9
Inequality: Measurement & Historical Trends

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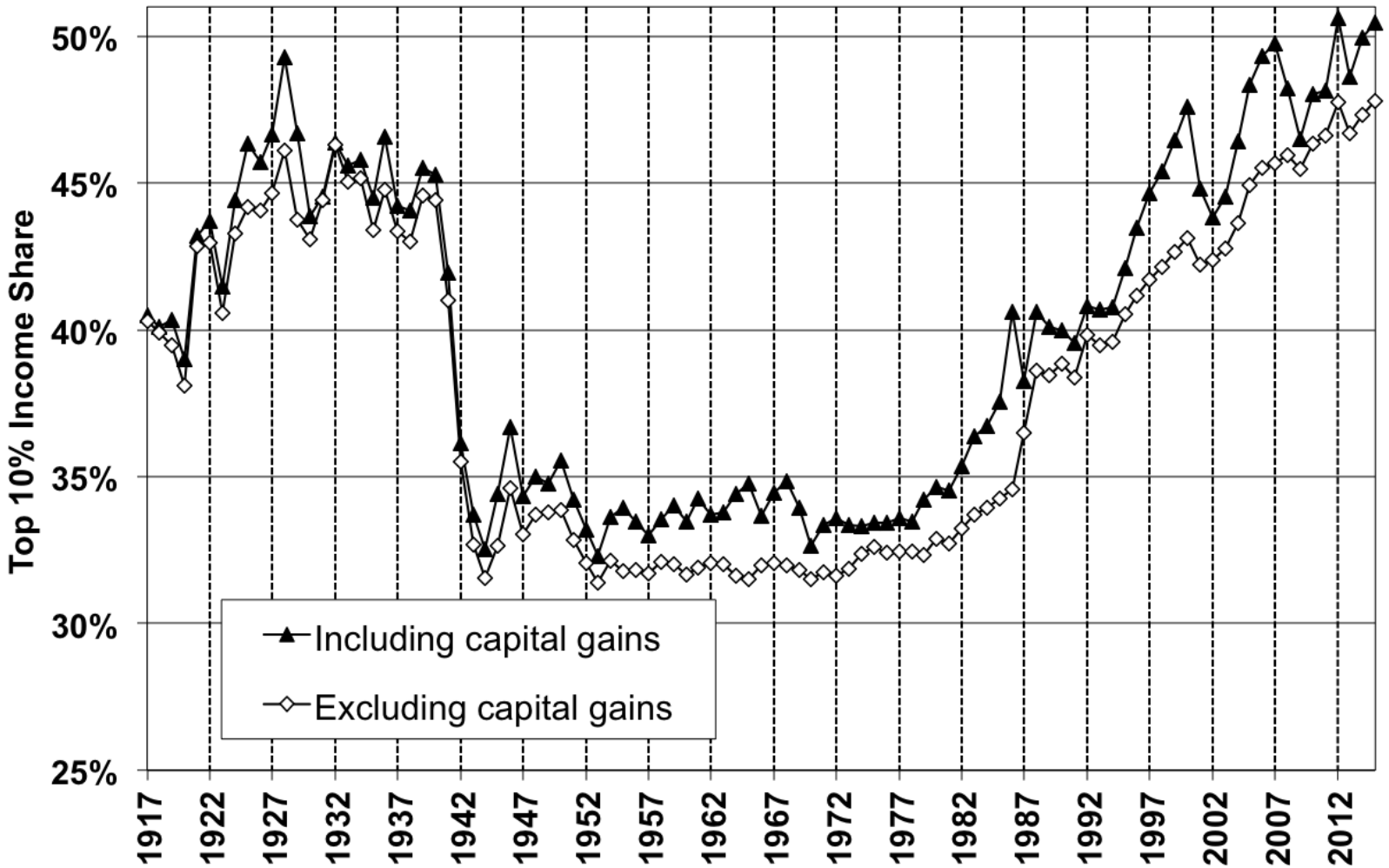
Key facts about income inequality

- U.S. labor income inequality has increased substantially since 1970 – debate as to whether this is about skilled biased technological change or changes in institutions
- In the U.S. top income shares dropped from 1929 to 1950, but have increased since 1980 (Piketty & Saez 2003)
- Top incomes used to consist of mostly capital income, but now split about 50/50 between labor and capital income
- Fall in top income shares from 1900-1950 occurred in most OECD countries, but recent surge in top income concentrated among English-speaking countries (Atkinson, Piketty, & Saez 2011)

Why should we care about inequality?

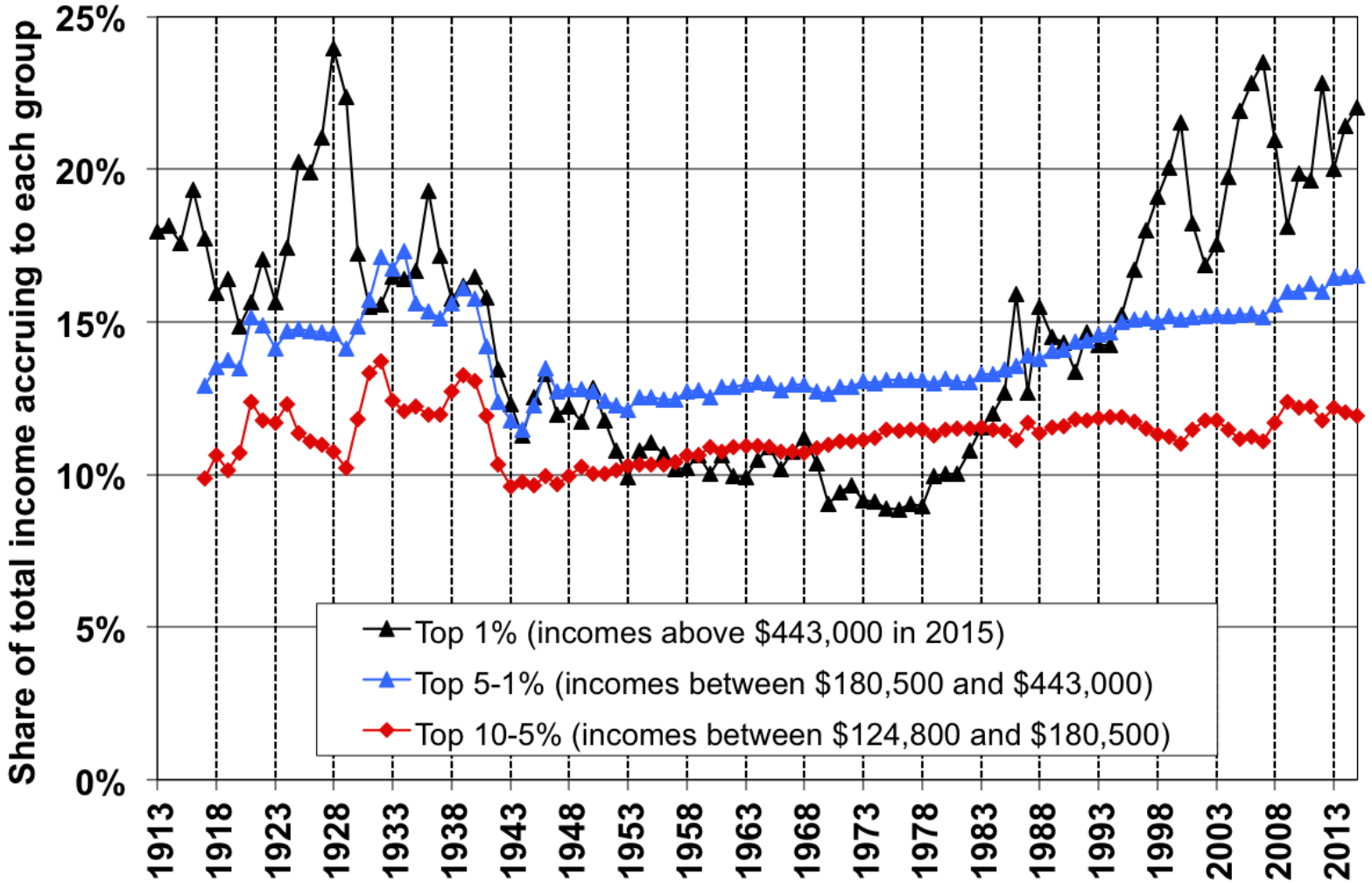
- Standard economic theory tells us that allocations may be efficient yet highly unequal
- Policy tradeoffs between efficiency and equity
  - Example: in a competitive market, imposing taxes on firm owners generates a deadweight loss but redistributes income from capital owners to citizens who benefit from government programs
- 2015 IMF report: "Causes and Consequences of Income Inequality"
  - Global evidence that actually (in)equality $\implies$ (in)efficiency
  - A 1% increase in the income share of the top 20% of households leads to 0.08% lower GDP growth in the following five years
  - A 1% increase in the income share of the bottom 20% (the poor) is associated with 0.38% higher GDP growth

The Top Decile Income Share, 1917 – 2015



Source: Piketty & Saez (2003), updated to 2015, `http://elsa.berkeley.edu/~saez/TabFig2015prel.xls`

Decomposing the Top 10% into 3 Groups, 1913 – 2015



Source: Piketty & Saez (2003), updated to 2015, `http://elsa.berkeley.edu/~saez/TabFig2015prel.xls`

The importance of entrepreneurial income

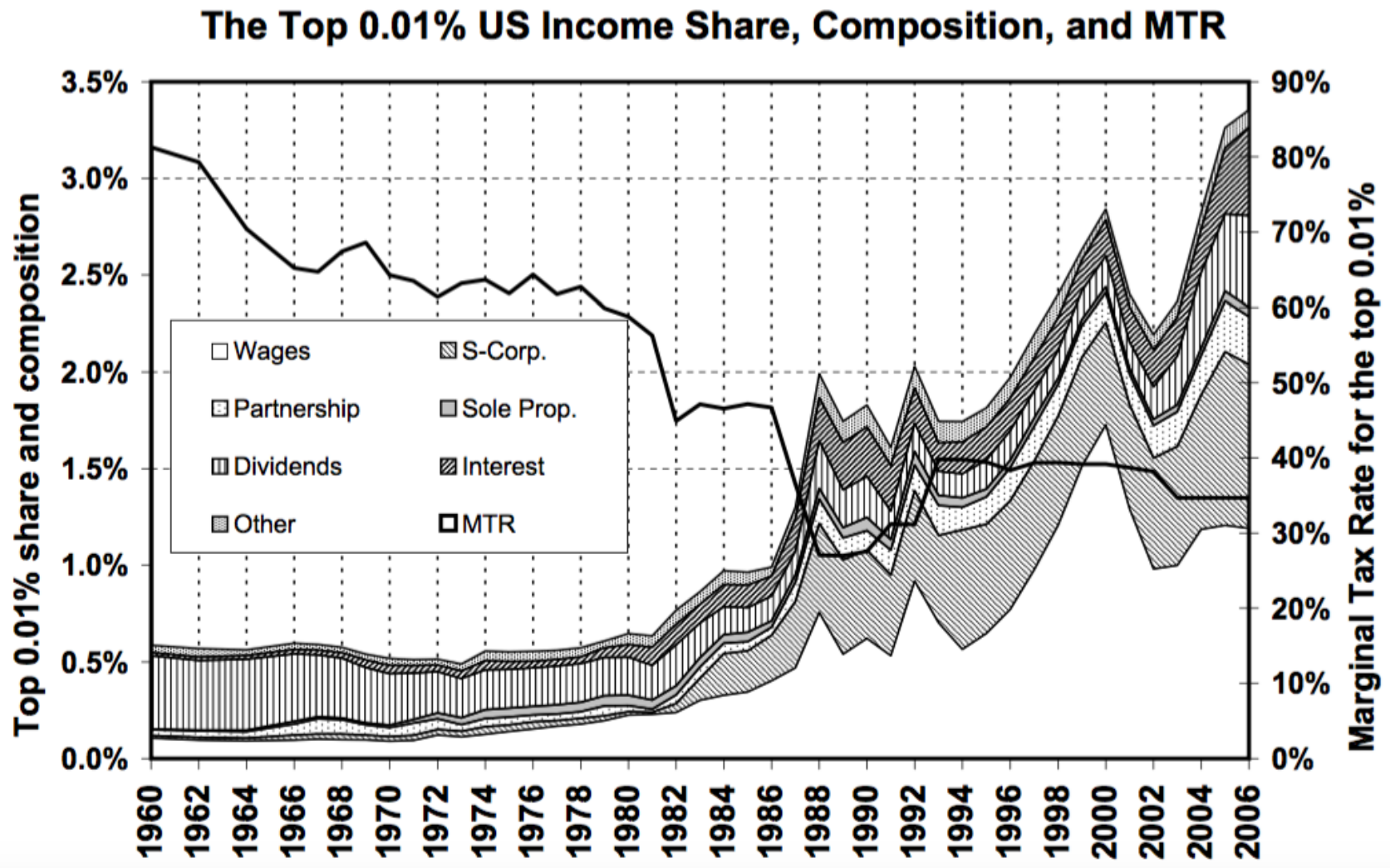
- Most of the rise in the top 1% income share in the 21st century has been driven by income from pass-through entities
  - These include sole proprietorships, partnerships, LLCs, and S-corporations (small businesses with ≤ 100 shareholders)
  - Standard enterprises face two-tiers of taxes – one on business profits and one on dividends distributed to shareholders
  - Pass-through entities only face the second of these two tiers because income passes through to owners

- S-corps make it easy to avoid Medicare and Social Security payroll (FICA) taxes – pay very little in direct compensation and shift all income to nontaxable dividends
- Suggests data on labor income alone will potentially not show the same trends in inequality as tax return data show

Example: the S-corp tax loophole

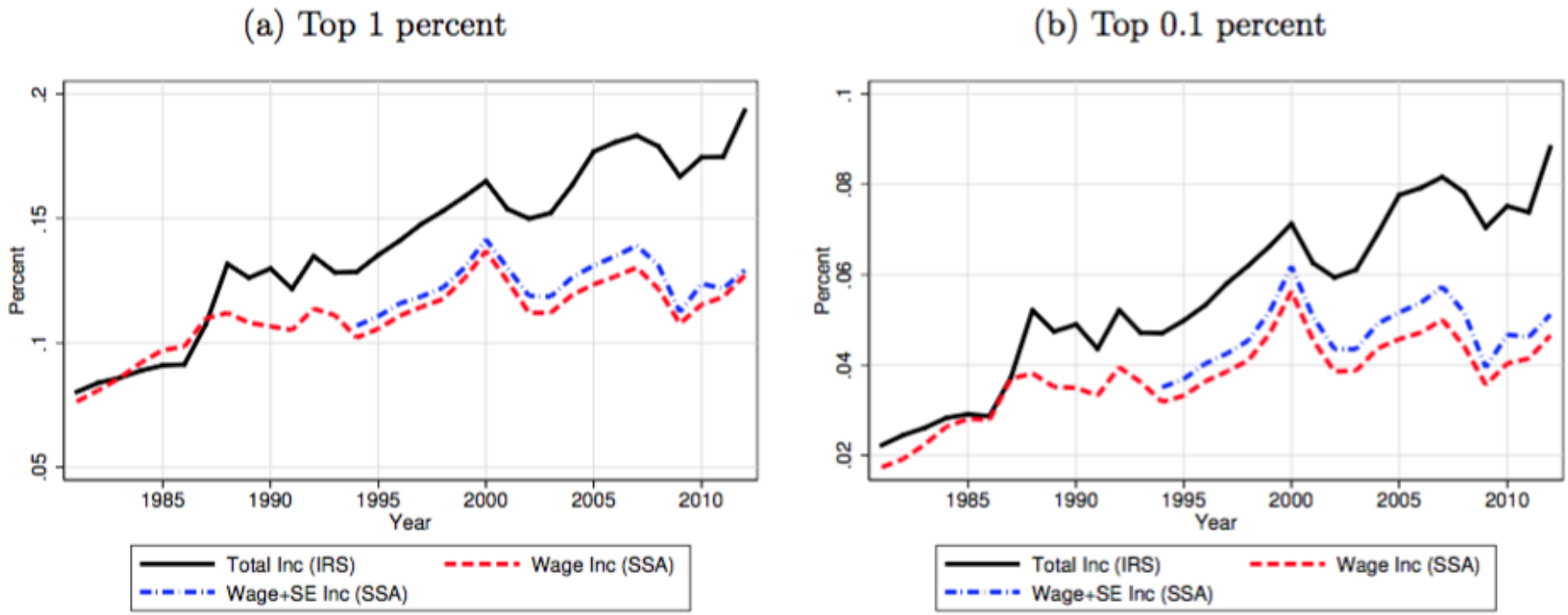
- If you are the sole proprietor of a business that made \$100,000 in profits you pay a 15.3% self-employment (payroll) tax
- Suppose instead you file your business as an S-corp and divide your profits into \$40,000 of wages you pay yourself and \$60,000 in dividends you distribute to the primary shareholder (also yourself)
- You pay the 15.3% tax on the wage income or \$6,120 but no tax on the dividend $\implies$ you avoid paying \$9,180 in taxes!
- Why not just pay all of the S-corp profits as a dividend? IRS requires "reasonable compensation" be paid to employees in the form of wages
- S-corps also allow active shareholders to avoid the 3.8% Medicare surtax on business profits created by the ACA

The top 0.01% and the rise of the S-corp



Which dataset on income should we use?

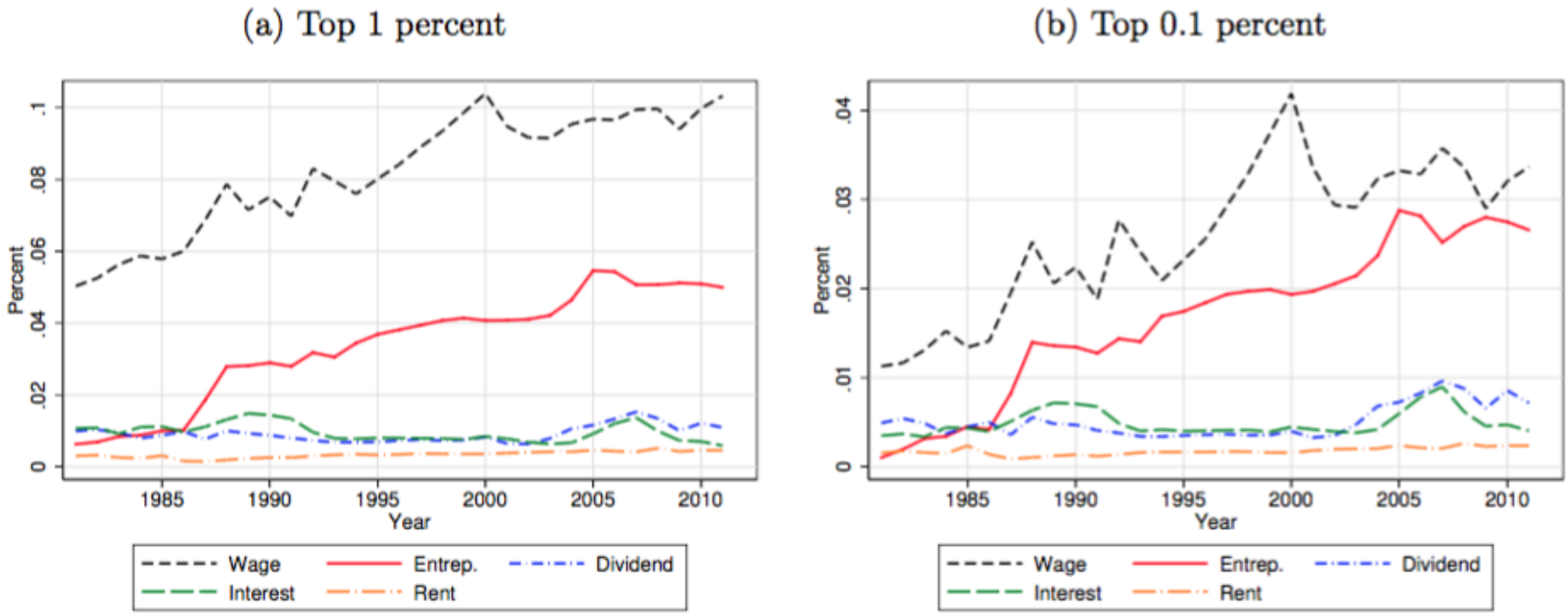
Figure 2: Top Income Shares, Alternative Sources



Source: Guvenen & Kaplan (2017), "Top Income Inequality in the 21st Century: Some Cautionary Notes," `http://gregkaplan.uchicago.edu/page/working-papers`

Sources of top income shares

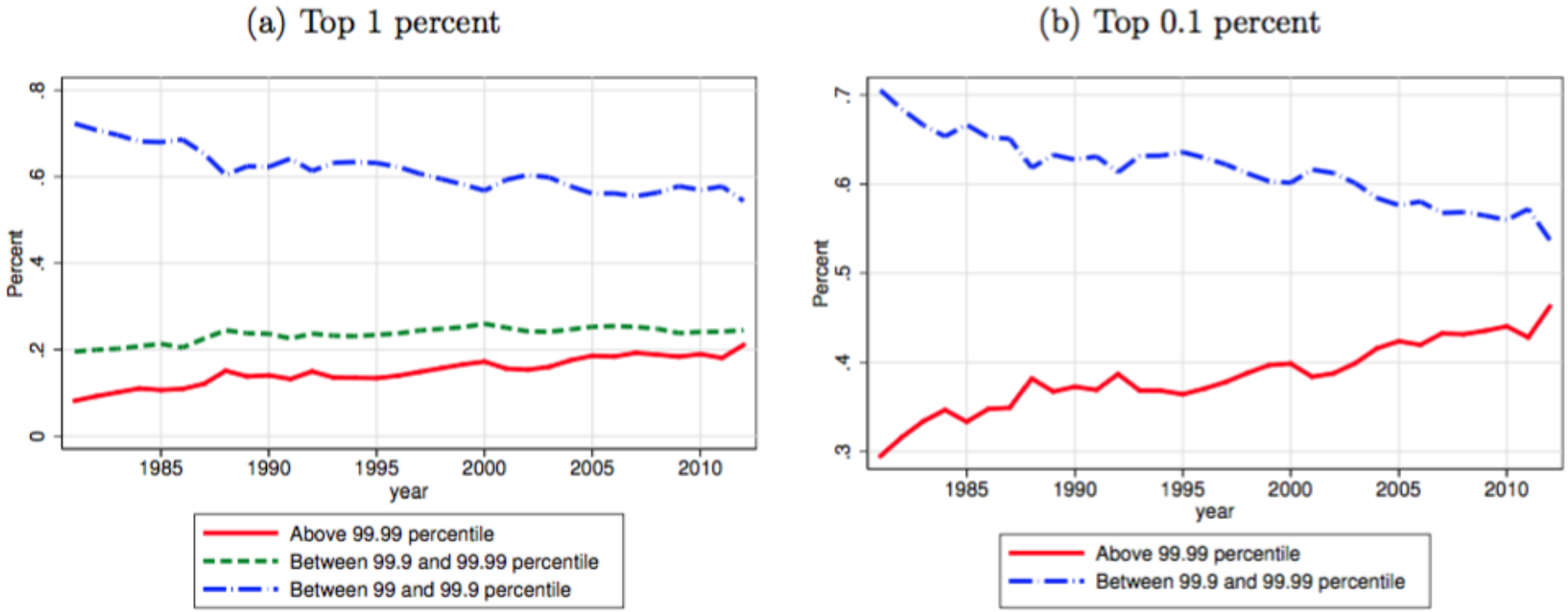
Figure 5: Breakdown of Top Income Shares



Source: Guvenen & Kaplan (2017), "Top Income Inequality in the 21st Century: Some Cautionary Notes," `http://gregkaplan.uchicago.edu/page/working-papers`

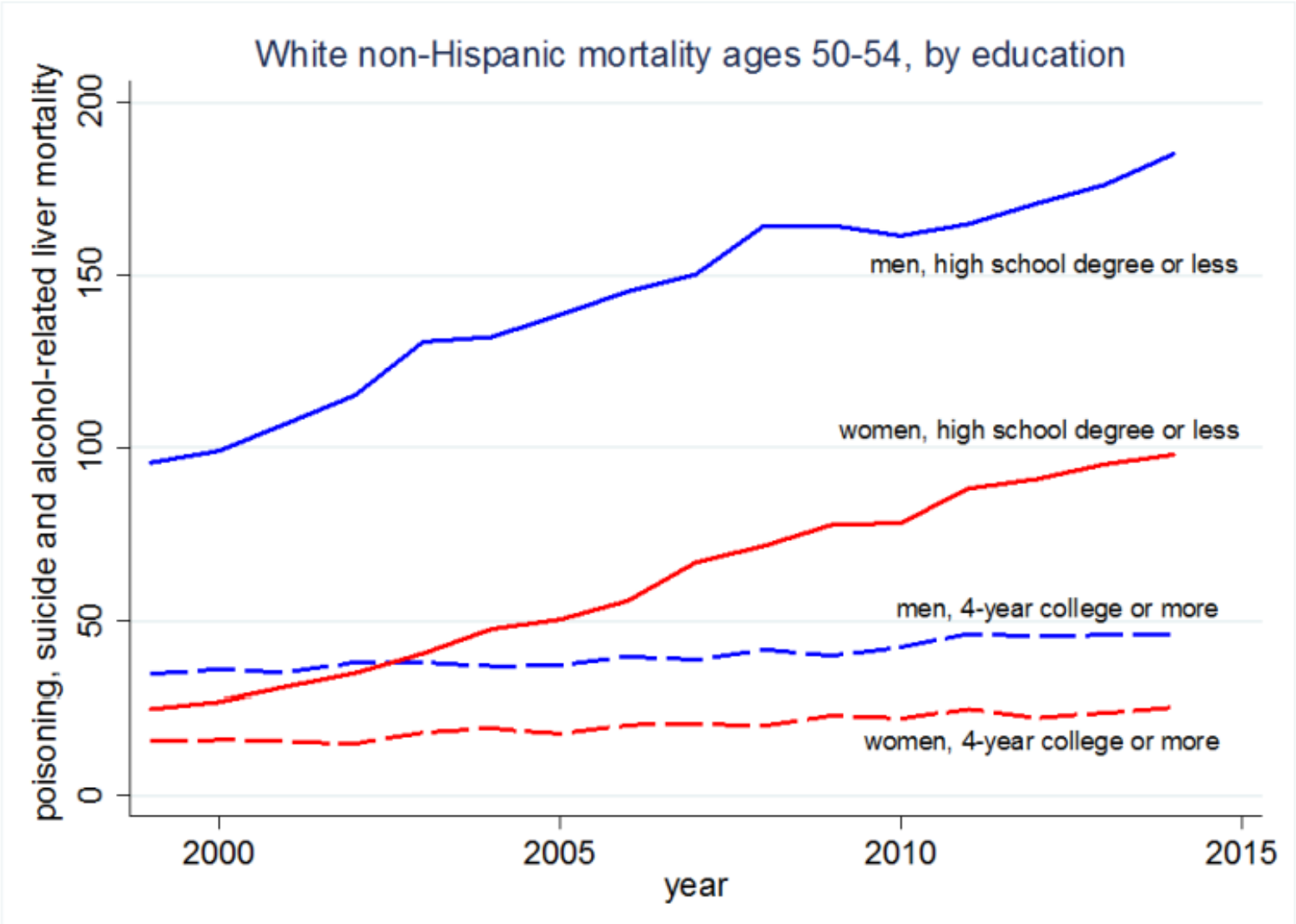
Decomposition of top income shares

Figure 7: Decomposition of Top Income Shares



Source: Guvenen & Kaplan (2017), "Top Income Inequality in the 21st Century: Some Cautionary Notes," `http://gregkaplan.uchicago.edu/page/working-papers`

Inequality in mortality also an issue



Source: Case & Deaton (2017), "Mortality and Morbidity in the 21st Century," *Brookings Papers on Economic Activity*

Measuring inequality

- Ultimately any statement about inequality is a statement about the distribution of resources within a society
- In practice we do not know the true distribution of resources across individuals and rely on data from tax authorities or from wealth and expenditure surveys
- We need to construct some summary measure(s) that approximates the true distribution
  - Percentile ratios: look at the level of resources obtained by one percentile and divide by the level obtained by another percentile
  - Compute a normalized measure of the difference between the empirical distribution of resources and an idealized "equal" distribution

Percentile ratios

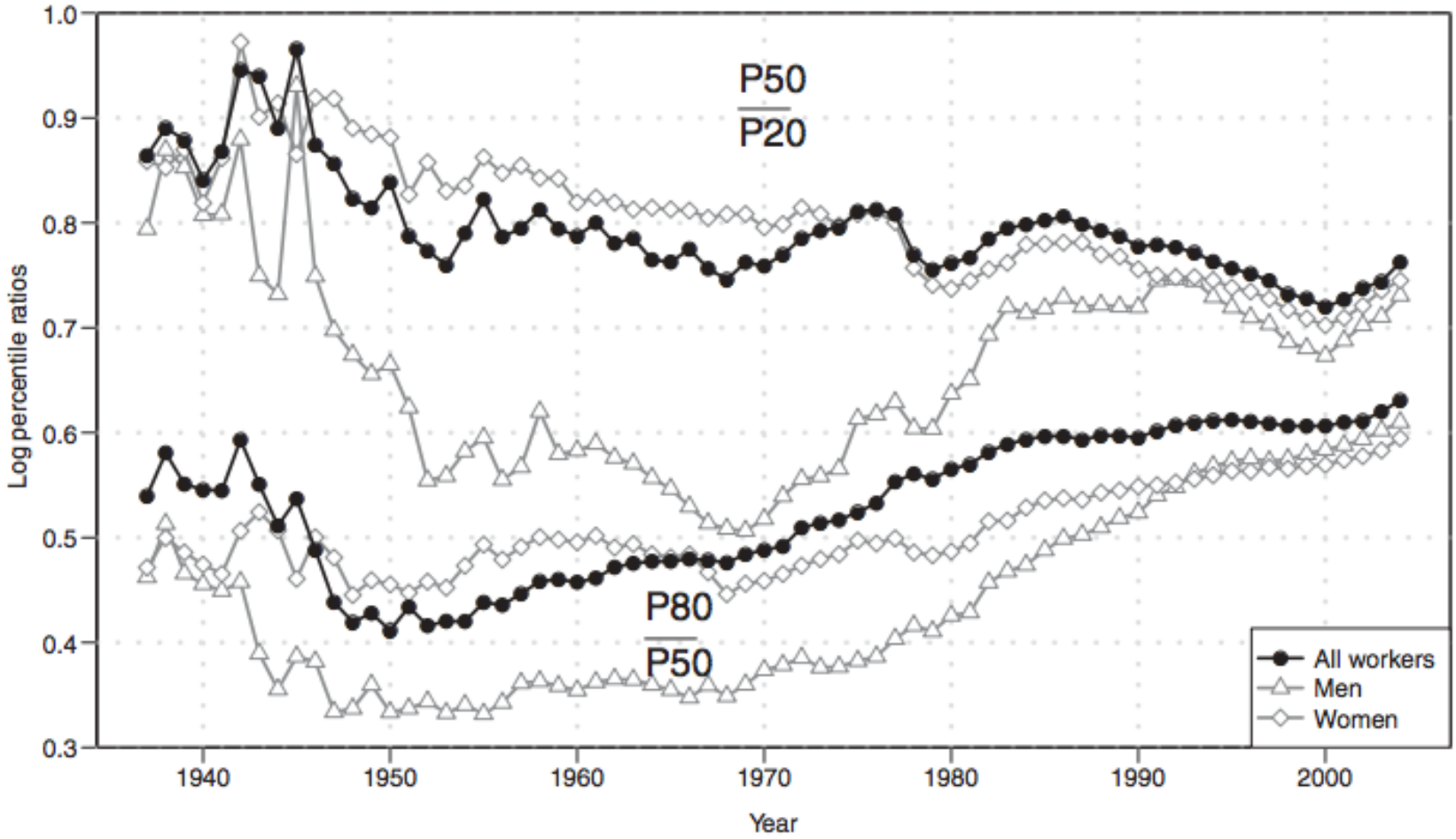
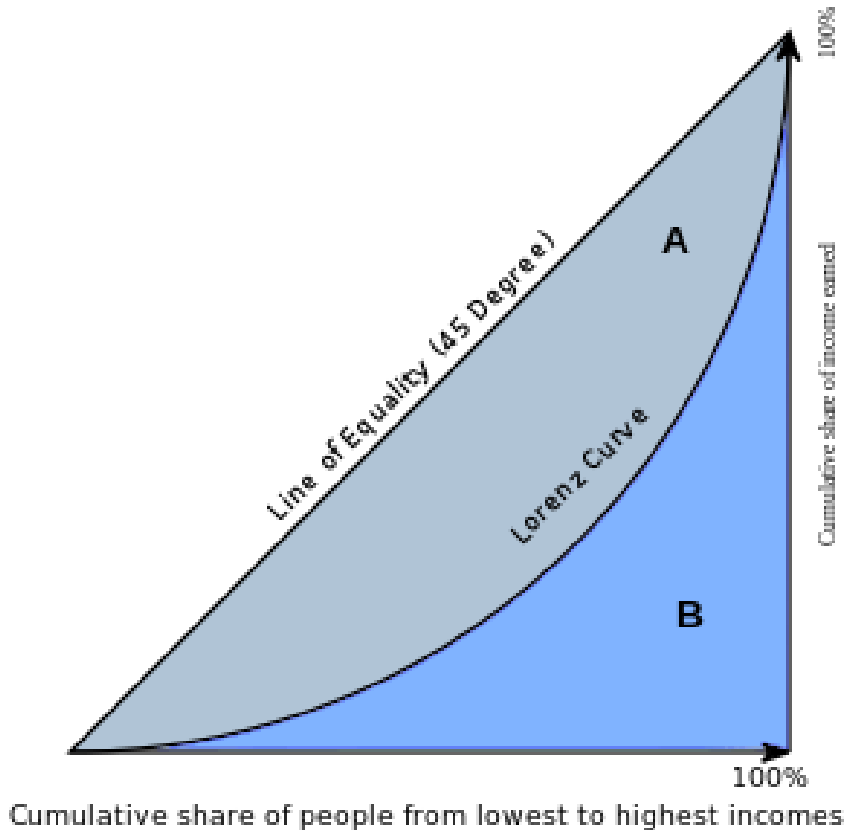


FIGURE II
Percentile Ratios log(P80/P50) and log(P50/P20)

Source: Kopczuk et al. (2010), "Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937," *Quarterly Journal of Economics*

Lorenz curve

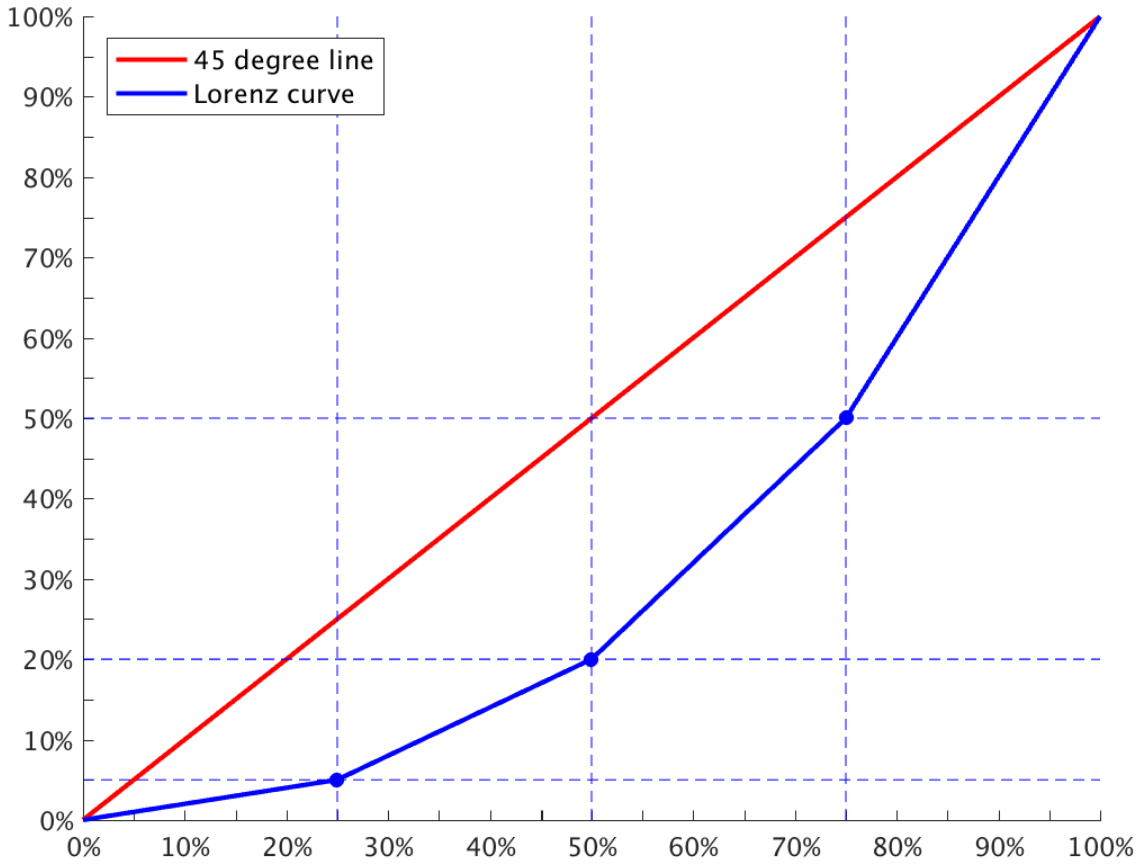
Lorenz curve: relationship between the cumulative share of people from lowest to highest incomes and the cumulative share of income earned



The Gini coefficient

- The most widely used measure of inequality is the **Gini coefficient**
- Gini coefficient is calculated as $G = \frac{A}{A+B} = 2A$
  - This is the ratio of the area between the total equality line and the Lorenz curve to the total area on the graph
  - Gives us some sense of how far society is from perfect equality
- Why is perfect equality a straight 45 degree line? The bottom 20% have 20% of society's income, the bottom 50% have 50% of society's income, and so on...
- The Gini coefficient belongs to a family of inequality statistics that uses an empirical distribution of resources to measure distance from some "ideal" distribution

Sample problem: calculating the Gini coefficient

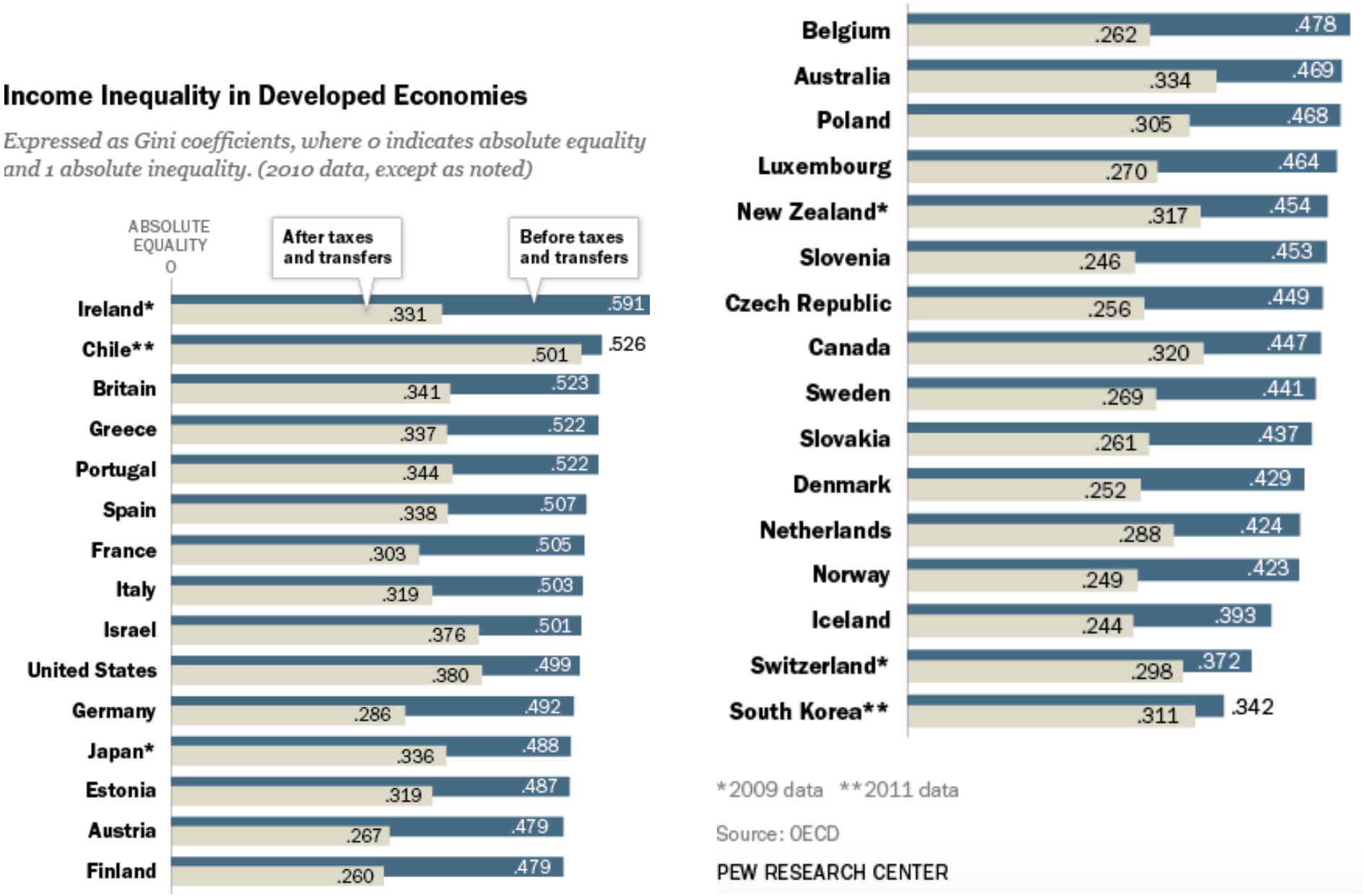


- The graph says: the bottom 25% earns 5% of (after-tax) income, the bottom 50% earns 20%, and the bottom 75% earns 50%

Computing the Gini coefficient

- We can use the shape of the Lorenz curve in the previous graph to compute the Gini
- If we knew the exact function form of the Lorenz curve, we could compute the Gini using integrals
- Instead we use the fact that $A + B = 1/2 \implies G = 2A = 1 - 2B$ and compute the area of B using basic geometry
- Break the area below the Lorenz curve into a combination of triangles and rectangles (or trapezoids) and find the area of each shape
- We end up with an after-tax Gini here of G = 0.375 which is roughly the after-tax Gini reported for the U.S.

International Gini coefficients



Limitations of the Gini

- The income Gini coefficient is a measure of *average* inequality
- Although it is a good summary statistic for comparing average inequality across countries, it misses trends at the top and bottom of the income distribution
- In particular, it also does not take into account more nuanced trends in institutional inequality
  - Example: minority families often receive higher interest rates on their mortgages, so for the same amount of income they can purchase less than white families
- Gini summarizes the *distribution* of resources, so any policy that aims to reduce the Gini must increase the share of resources accruing to the bottom

Income vs. wealth vs. consumption inequality

- We can also look at how shares of wealth in the economy have changed over time
  - Wealth captures the market value of all assets owned by the household (stocks, land, jewelry, etc.)
  - Difficult to measure because many assets are non-taxable and taxes encourage people to hide their wealth
  - Saez & Zucman (2016): large inequality in savings rates after the mid-1980s

- Most evidence of consumption inequality comes from self-reported expenditure data from household surveys
  - Aguiar & Bils (2015): consumption inequality mirrors income inequality after correcting for measurement error in expenditure surveys

- Limited evidence suggests patterns are roughly the same whether we look at income, wealth, or consumption data

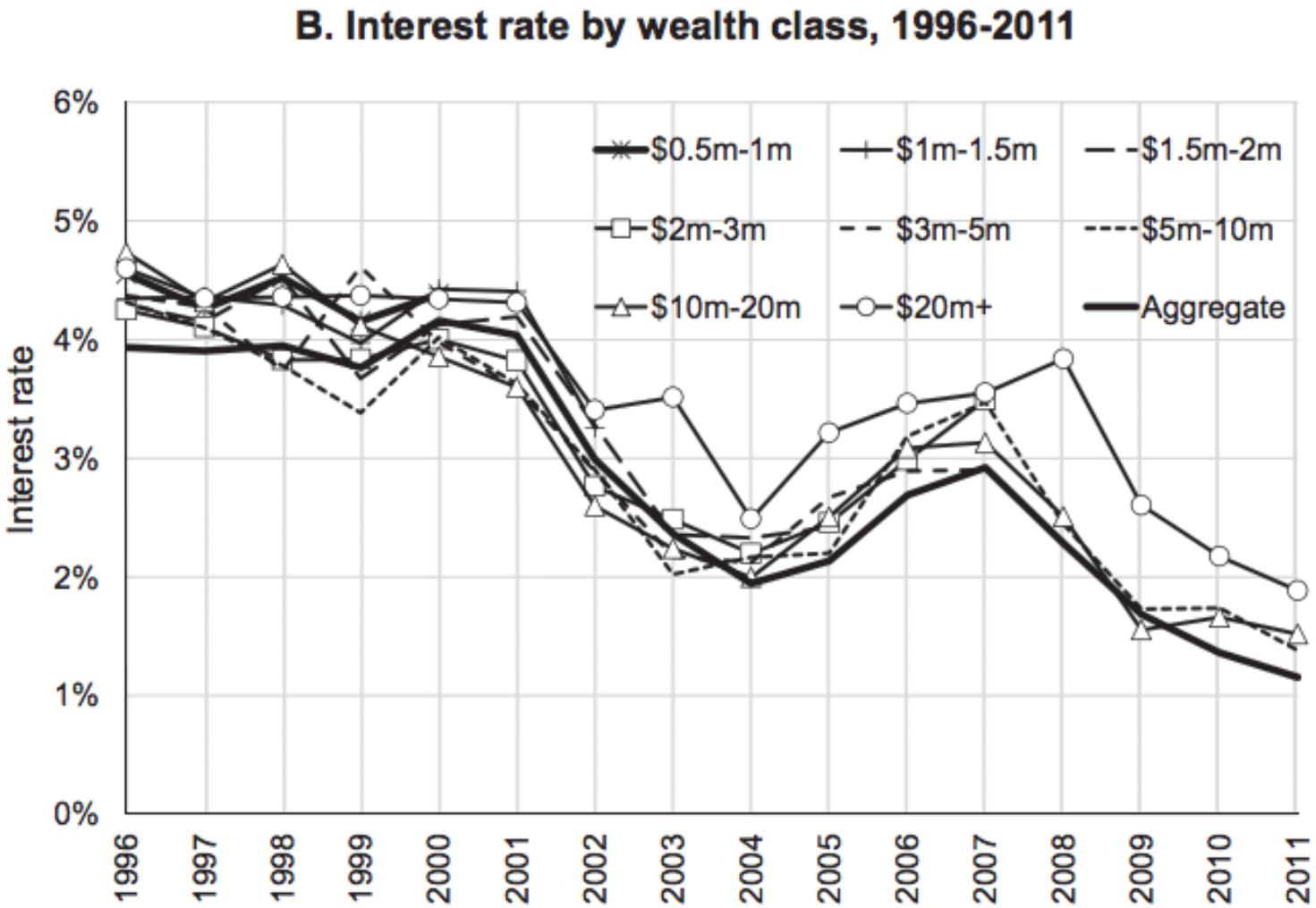


FIGURE V

Rates of Returns by Wealth Using Matched Estate and Income Tax Data

Source: Saez & Zucman (2016), "Wealth Inequality in the United States Since 1913: Evidence from Capitalized Income Tax Data," *Quarterly Journal of Economics*

TABLE I

THRESHOLDS AND AVERAGE WEALTH IN TOP WEALTH GROUPS, 2012

Wealth group	Number of families	Wealth threshold	Average wealth	Wealth share
	Panel A: Top wealth groups			
Full Population	160,700,000		$343,000	100%
Top 10%	16,070,000	$660,000	$2,560,000	77.2%
Top 1%	1,607,000	$3,960,000	$13,840,000	41.8%
Top 0.1%	160,700	$20,600,000	$72,800,000	22.0%
Top .01%	16,070	$111,000,000	$371,000,000	11.2%
	Panel B: Intermediate wealth groups			
Bottom 90%	144,600,000		$84,000	22.8%
Top 10-1%	14,463,000	$660,000	$1,310,000	35.4%
Top 1-0.1%	1,446,300	$3,960,000	$7,290,000	19.8%
Top 0.1-0.01%	144,600	$20,600,000	$39,700,000	10.8%
Top .01%	16,070	$111,000,000	$371,000,000	11.2%

Notes. This table reports statistics on the wealth distribution in the United States in 2012 obtained by capitalizing income tax returns. The unit is the family (either a single person aged 20 or above or a married couple, in both cases with children dependents if any). Fractiles are defined relative to the total number of families in the population. Source: Online Appendix Table B1.

Source: Saez & Zucman (2016), "Wealth Inequality in the United States Since 1913: Evidence from Capitalized Income Tax Data," *Quarterly Journal of Economics*

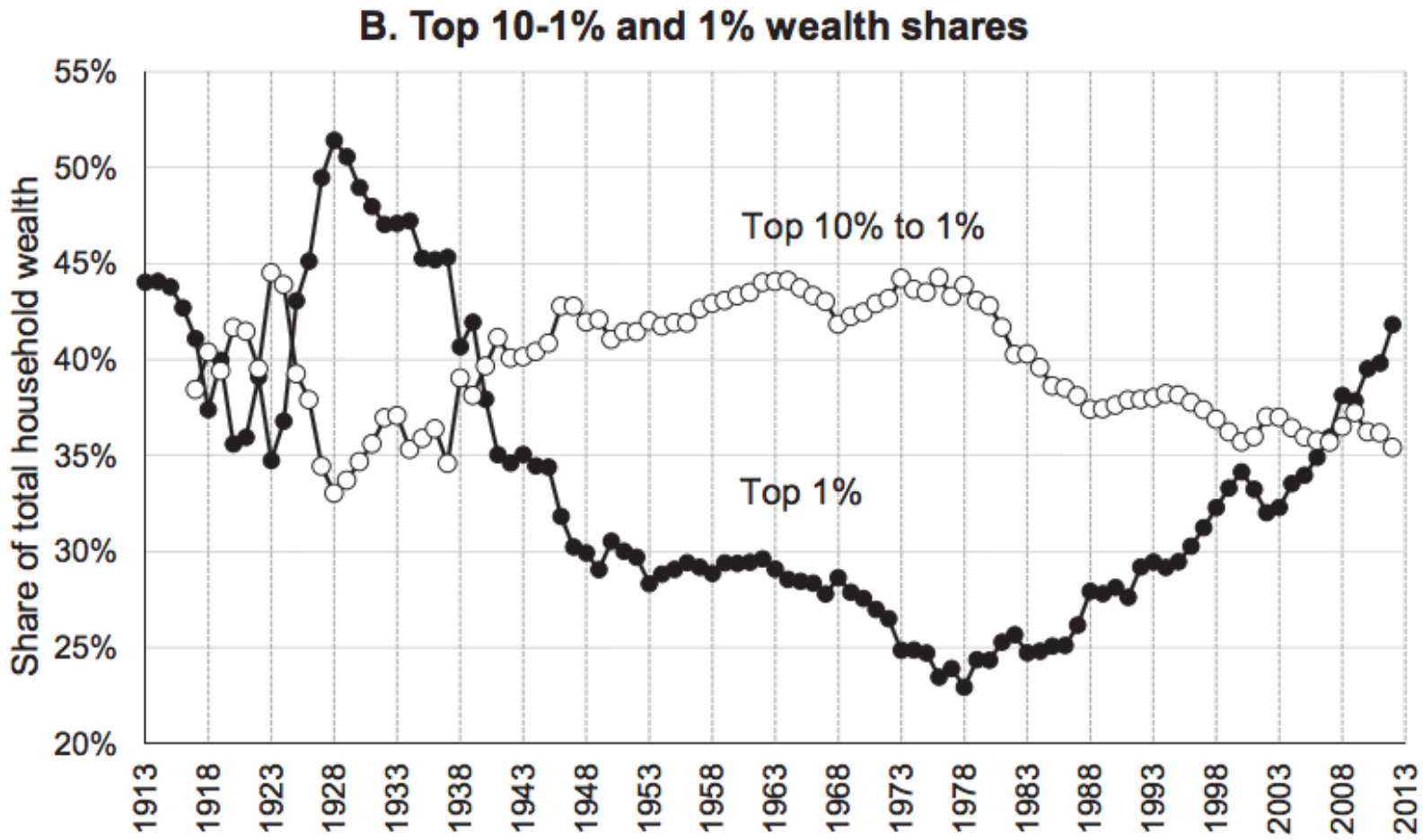


FIGURE VI

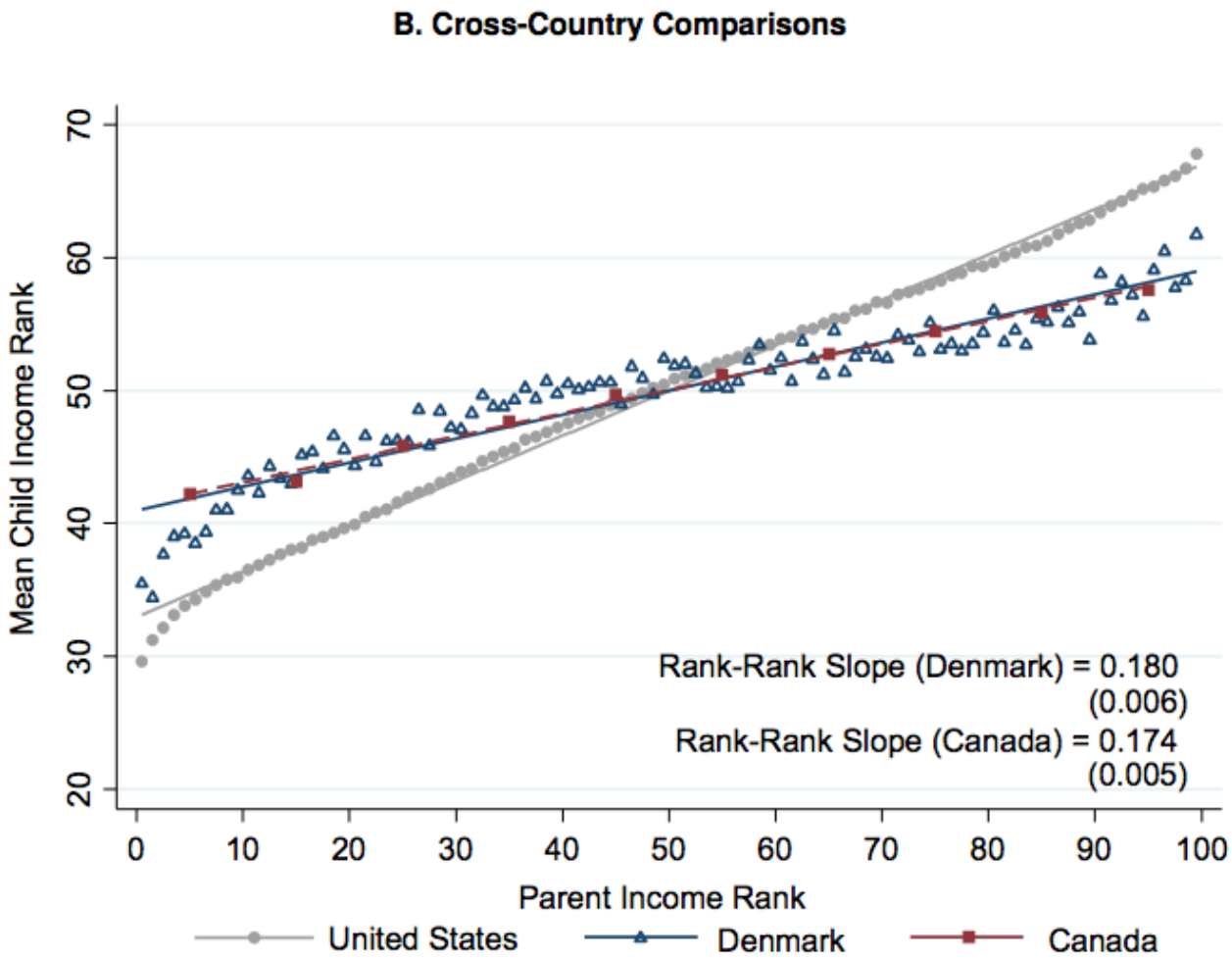
Top Wealth Shares in the United States, 1913–2012

Source: Saez & Zucman (2016), "Wealth Inequality in the United States Since 1913: Evidence from Capitalized Income Tax Data," *Quarterly Journal of Economics*

Alternative measure: intergenerational mobility

- We might also be interested in how differences in economic status persist across generations
- To gauge this persistence we might ask questions like...
  - If your parents were in the top half of the income distribution, what is the probability you are also in the top half of the income distribution?
  - Or for educational attainment: if one of your grandparents attended Columbia University, how likely are you to attend an Ivy League school?
- Key measure of mobility is the correlation between parent and child percentile ranks within a distribution
- Can look at long-term persistence by looking at grandparent-child, or great-grandparent-child ranks, etc.

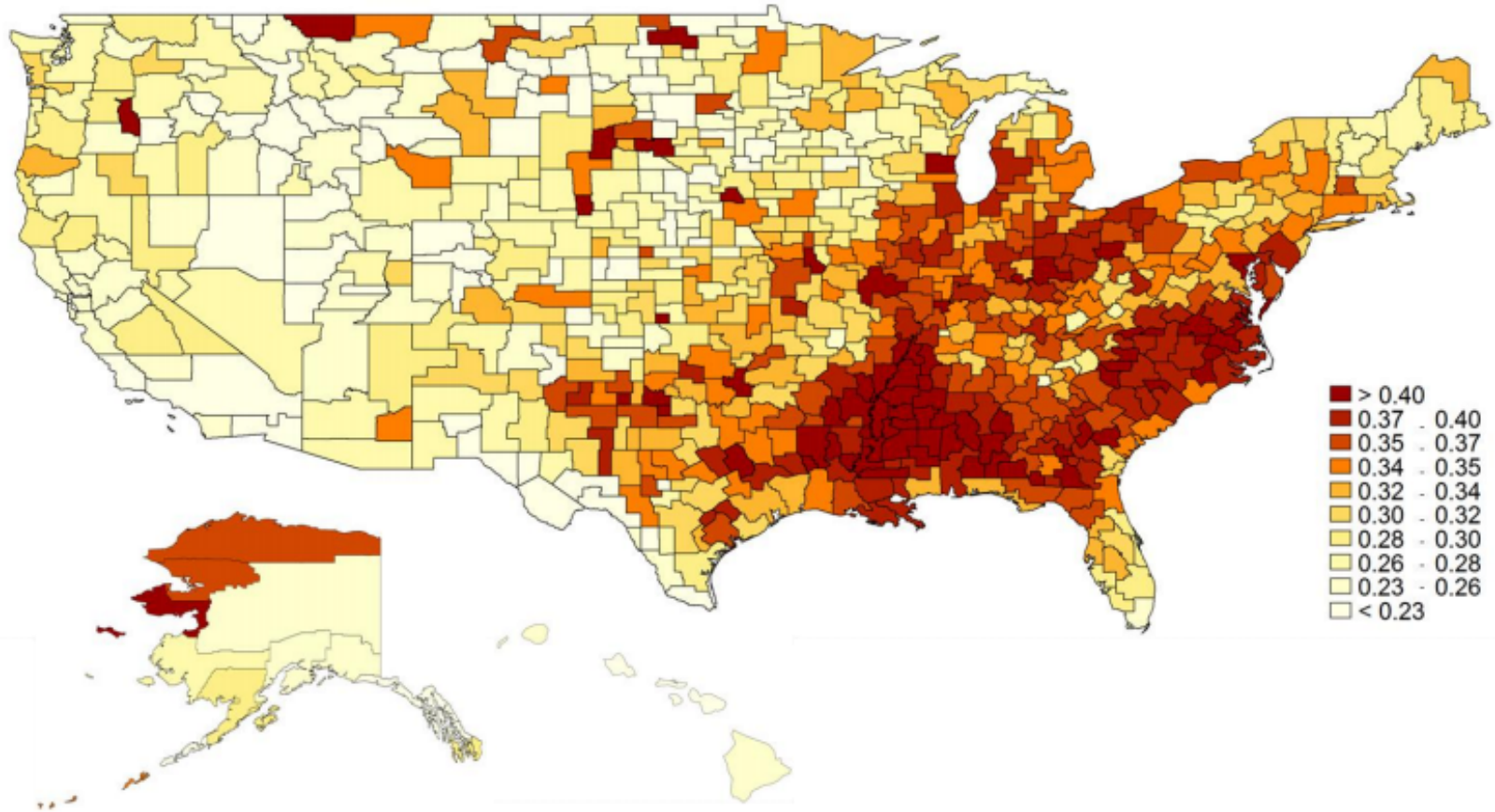
Intergenerational mobility: U.S. vs. Denmark and Canada



Source: Chetty et al. (2014), "Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States," *NBER Working Paper* No. 19843

Spatial distribution of mobility in the U.S.

FIGURE 3
Intergenerational Mobility (Parent-Rank and Child-Rank Income Correlation)



Source: Chetty et al. (2013), "The Economic Impacts of Tax Expenditures: Evidence from Spatial Variation across the U.S.," *NBER Summer Institute Conference Paper*

Earnings mobility vs. Gini coefficients

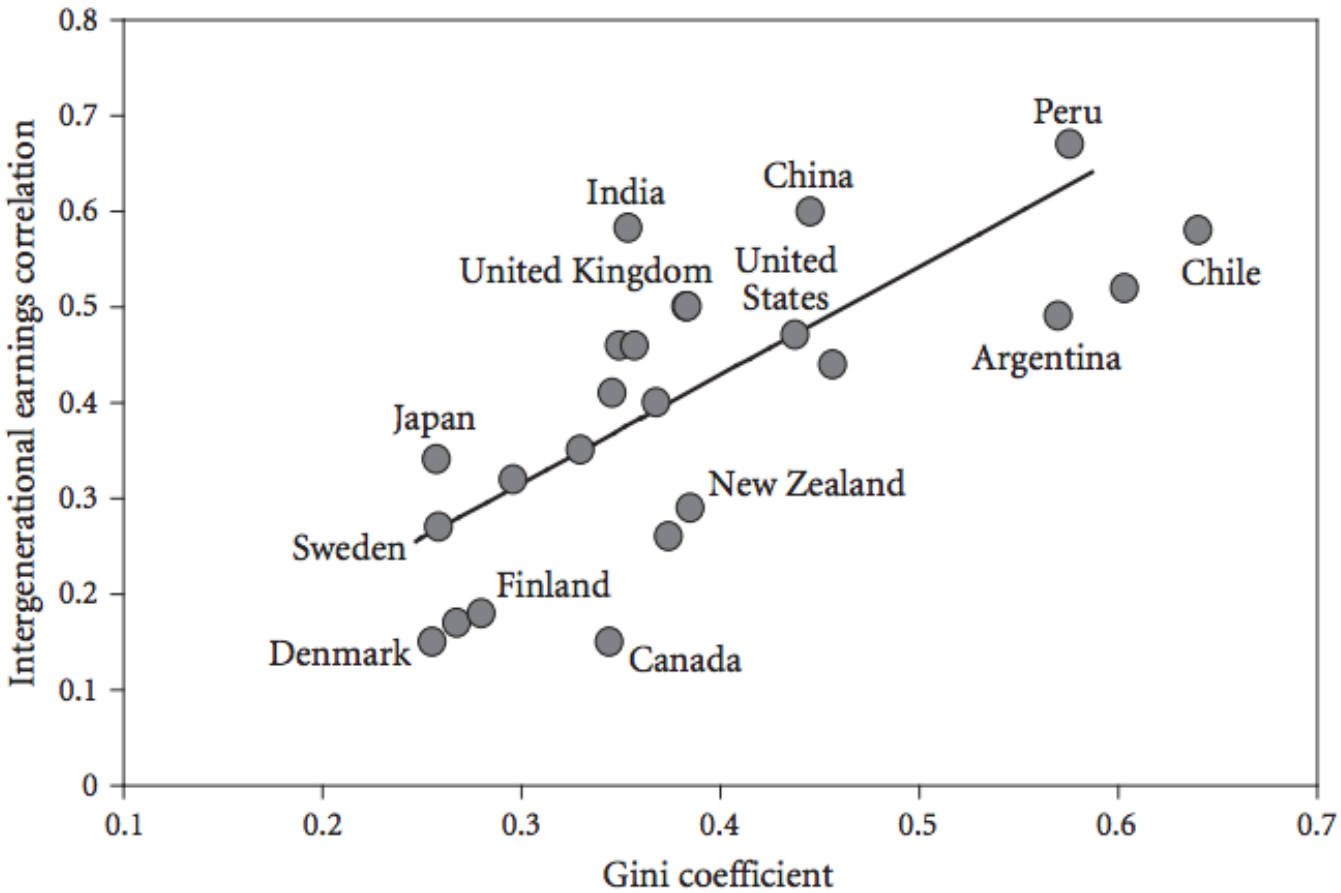


FIGURE 1.3. Intergenerational earnings correlation and inequality.

Source: Clark (2015), The Son Also Rises: Surnames and the History of Social Mobility, Introduction, `http://press.princeton.edu/chapters/i10181.pdf`

Education status mobility vs. Gini coefficients

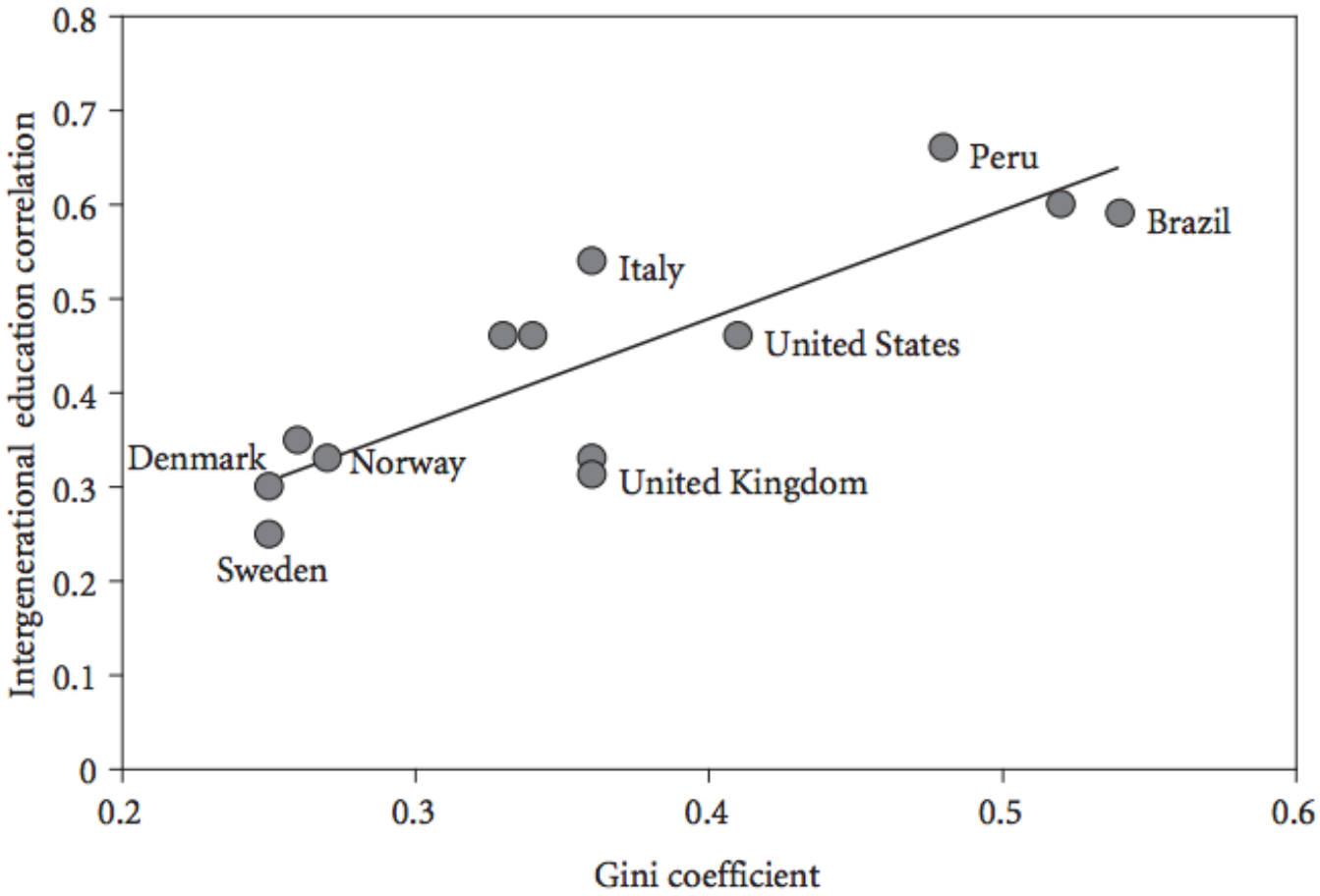


FIGURE 1.4. Intergenerational education correlation and income inequality.

Source: Clark (2015), The Son Also Rises: Surnames and the History of Social Mobility, Introduction, `http://press.princeton.edu/chapters/i10181.pdf`

The son also rises

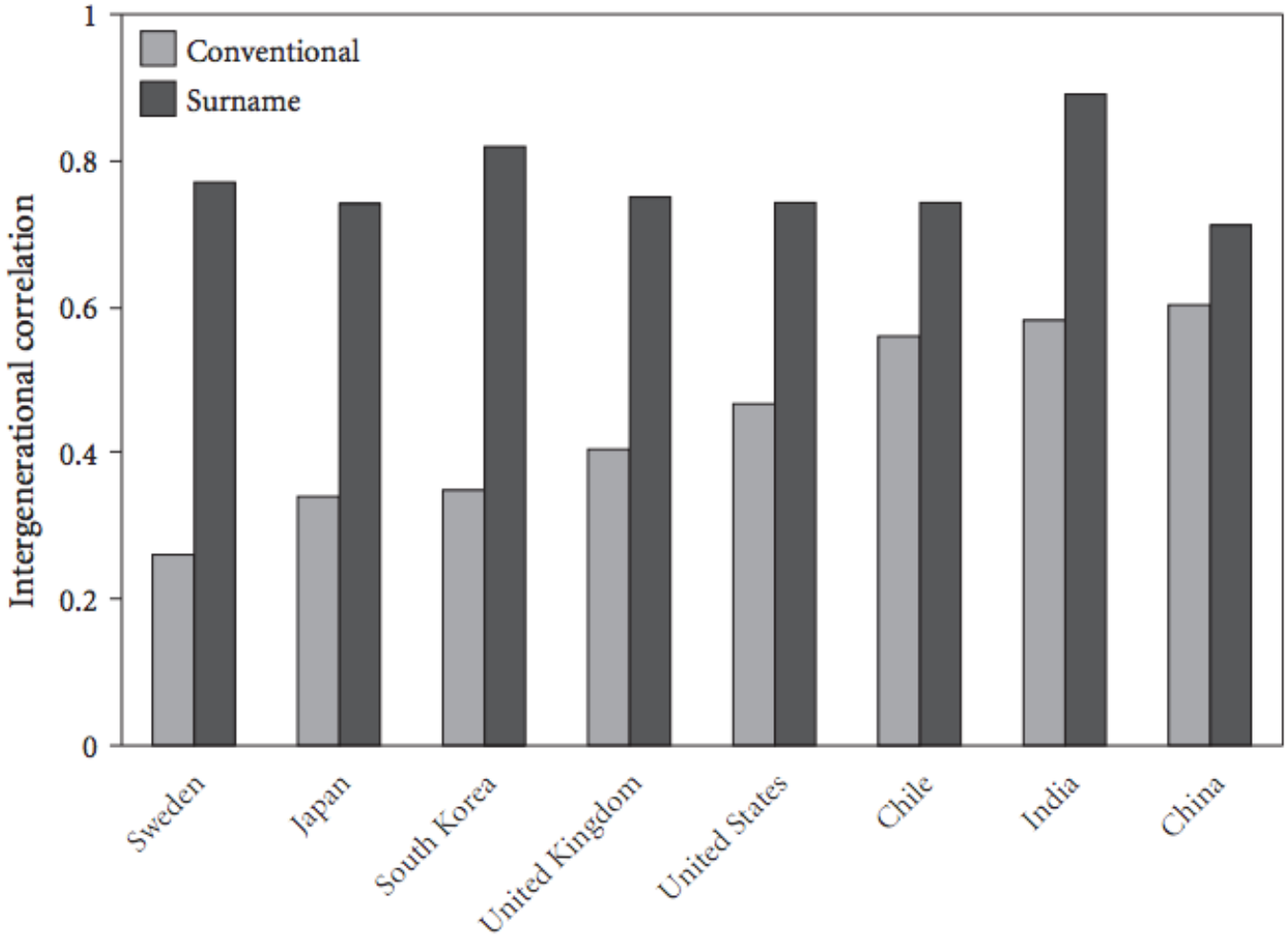


FIGURE 1.6. Conventional versus surname estimates of status persistence.

Source: Clark (2015), The Son Also Rises: Surnames and the History of Social Mobility, Introduction, `http://press.princeton.edu/chapters/i10181.pdf`

What do surnames capture?

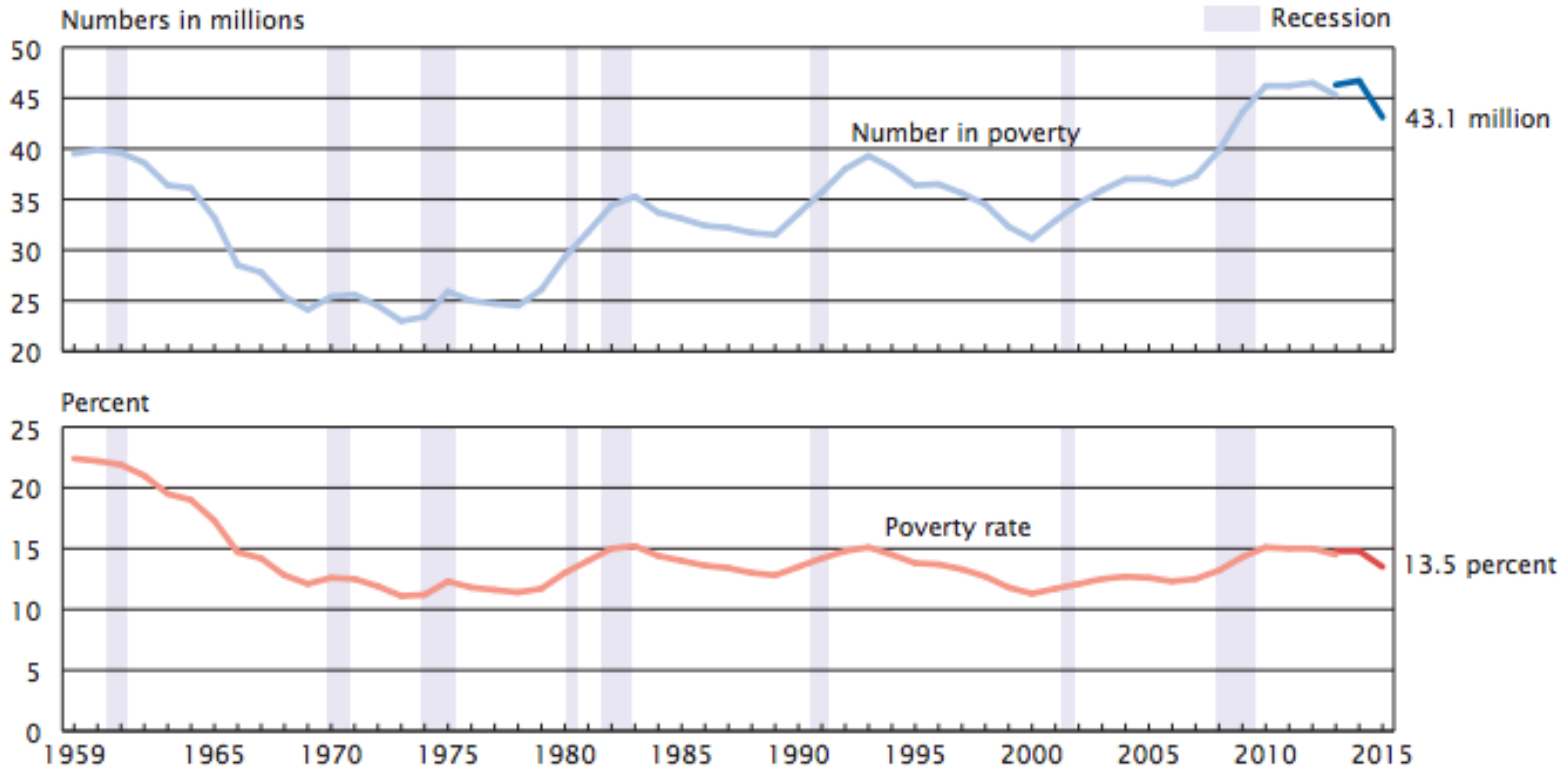
- Intergenerational correlations of wealth/education are 0.2-0.5 for economically advanced countries
- But intergenerational surname status correlations are 0.7-0.9
- Example: surnames that were considered elite in Medieval England are still over-represented in politics and professional occupations today
- Implication: regression to the mean is much faster when looking at income/wealth/education than social status
  - Social phenotype: education level, wealth, property imperfectly inherited across generations
  - Social genotype: family characteristics or "social competence" are almost perfectly inherited
- Surnames do not just capture genetics – importance of legacy status in university admissions

Definitions of poverty

- Census Bureau sets the poverty line at three times the cost of a minimum food diet in 1963 updated annually for inflation
  - Adjusted for family size, composition, and age of household head
- U.S. poverty line is an *absolute threshold*, whereas European countries use a percentage threshold of about 50-60% of median income
- Poverty headcount: the number of people whose income falls short of the threshold (13.5% of the U.S. population in 2015)
- Poverty gap: the minimum amount of transfer money needed to bring everyone up to the threshold
- Standard definitions of poverty do not account for things like pollution levels, school quality, differences in costs of living across cities/states

Trends in U.S. poverty rate

Figure 4.
Number in Poverty and Poverty Rate: 1959 to 2015



Note: The data for 2013 and beyond reflect the implementation of the redesigned income questions. The data points are placed at the midpoints of the respective years. For information on recessions, see Appendix A. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see <www2.census.gov/programs-surveys/cps/techdocs/cpsmar16.pdf>.

Source: U.S. Census Bureau, Current Population Survey, 1960 to 2016 Annual Social and Economic Supplements.

Summary

- U-shaped trend in income inequality over the last 100 years, with explosive income growth at the very top over the last 15 years
- How do we measure inequality?
  - Measures based on the deviation of the income/wealth distribution from the perfect equality benchmark: Gini coefficient, percentile ratios
  - Intergenerational correlation of economic outcomes (wealth/income, education, social status)
- What type of inequality do we care about?
  - Primarily rely on tax data for information about income inequality
  - But not all sources of income are recorded in tax data
  - Inequality in consumption and wealth more difficult to measure
  - Recent focus on inequality in health outcomes