Lecture 1: Income Distribution, Poverty, Taxes and Transfers

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Fall 2019
My research

Mostly in public econ, mixed with labor, macro, & political economy.

Both theory and empirical work.

Long-run effects of taxation:
  Capital taxation;
  Education
  Innovation, R&D Policies

What shapes our views on policies and redistribution?
  Large-scale online surveys and experiments in many countries.

Taxation in imperfect markets:
  Rent-seeking
  Information frictions
Public Economics (or public finance) = Study of the Role of the Government in the Economy

Government is instrumental in most aspects of economic life:

1) Government in charge of huge regulatory structure

2) Taxes: governments in advanced economies collect 35-50% of National Income in taxes

3) Expenditures: tax revenue funds traditional public goods (infrastructure, public order and safety, defense) and welfare state (Education, Retirement benefits, Health care, Income Support)

4) Macro-economic stabilization through central bank (interest rate, inflation control), fiscal stimulus, bailout policies
Four questions of public finance

1) When should the government intervene in the economy?
2) How might the government intervene?
3) What is the effect of those interventions on economic outcomes?
4) Why do governments choose to intervene in the way that they do?
When should the government intervene in the economy?

1) Market Failures: Market economy sometimes fails to deliver an outcome that is efficient ⇒ Government intervention may improve the situation

2) Redistribution: Market economy generates substantial inequality in economic resources across individuals ⇒ People willing to pool their resources (through government taxes and transfers) to help reduce inequality
Main Market Failures

1) **Externalities:** (example: greenhouse carbon emissions) ⇒ require govt interventions (Pigouvian taxes/subsidies, public good provision)

2) **Imperfect competition:** (example: monopoly) ⇒ requires regulation (typically studied in Industrial Organization)

3) **Imperfect or Asymmetric Information:** (example: adverse selection in health insurance may require mandatory insurance)

4) **Individual failures:** People are not always rational. This is analyzed in behavioral economics, field in huge expansion (example: myopic people may not save enough for retirement)
Inequality and Redistribution

Even if market outcome is efficient, society might not be happy with the market outcome because market equilibrium might generate very high economic disparity across individuals.

Governments use taxes and transfers to redistribute from rich to poor and reduce inequality.

Redistribution through taxes and transfers might reduce incentives to work (efficiency costs).

⇒ Redistribution creates an equity-efficiency trade-off.

Income inequality has soared in the United States in recent decades, and has moved to the forefront in the public debate (Piketty’s 2014 book success, stats from Piketty-Saez-Zucman ’16).
Share of national income going to top 10% adults (pre-tax)

Source: Appendix Tables II-B1 and II-C1
Top 10% national income share: pre-tax vs. post-tax

Source: Appendix Tables II-B1 and II-C1
Average, bottom 90%, bottom 50% real incomes per adult

Average national income per adult: 61% growth from 1980 to 2014

Bottom 90% pre-tax: 30% growth from 1980 to 2014

Bottom 50% pre-tax: 1% growth from 1980 to 2014
How Might the Government Intervene?

1) Tax or Subsidize Private Sale or Purchase: Tax goods that are overproduced (e.g. carbon tax) and subsidized goods underproduced (e.g., flu shots subsidies)

2) Restrict or Mandate Private Sale or Purchase: Restrict the private sale or purchase of overproduced goods (e.g. fuel efficiency requirements), or mandate the private purchase of underproduced goods (e.g., auto insurance)

3) Public Provision: The government can provide the good directly, in order to potentially attain the level of consumption that maximizes social welfare (example is National Defense)

4) Public Financing of Private Provision: Government pays for the good but private sector supplies it (e.g., privately provided health insurance paid for by US government in Medicare-Medicaid)
What Are the Effects of Alternative Interventions?

1) Direct Effects: The effects of government interventions that would be predicted if individuals did not change their behavior in response to the interventions.

Direct effects are relatively easy to compute.

2) Indirect Effects: The effects of government interventions that arise only because individuals change their behavior in response to the interventions (sometimes called unintended effects).

Empirical public economics analysis tries to estimate indirect effects to inform the policy debate.

Example: increasing top income tax rates mechanically raises tax revenue but top earners might work less and earn less, reducing tax revenue relative to mechanical calculation.
Why Do Governments Do What They Do?

**Political economy**: The theory of how the political process produces decisions that affect individuals and the economy

**Example**: Understanding how the level of taxes and spending is set through voting and voters’ preferences

**Public choice** is a sub-field of political economy from a Libertarian perspective that focuses on *government failures*

*government failures* = situations where the government does not act in the benefit of society
Normative vs. Positive Public Economics

**Normative Public Economics:** Analysis of How Things Should be (e.g., should the government intervene in health insurance market? how high should taxes be?, etc.)

**Positive Public Economics:** Analysis of How Things Really Are (e.g., Does govt provided health care crowd out private health care insurance? Do higher taxes reduce labor supply?)

Positive Public Economics is a required 1st step before we can complete Normative Public Economics

Positive analysis is primarily empirical and Normative analysis is primarily theoretical
In many situations, individuals may not or do not seem to act in their best interests [e.g., many individuals are not able to save for retirement].

Two Polar Views on such situations:

1) **Paternalism [Libertarian View]** Individual failures do not exist and government wants to impose its own preferences against individuals’ will

2) **Individual Failures [Behavioral Economics View]** Individual Failures exist: Self-control problems, Cognitive Limitations

Distinguishing the 2 views: Under Paternalism, individuals are opposed to government interventions. If individuals understand they have failures, they will support govt interventions.
Key Facts on Taxes and Spending

1) **Government Growth**: Size of government relative to National Income grows dramatically over the process of development from less than 10% in less developed economies to 30-50% in most advanced economies.

2) **Government Size Stable** in richest countries after 1980.

3) **Government Growth** is due to the expansion of the **welfare state**: (a) public education, (b) public retirement benefits, (c) public health insurance, (d) income support programs.

4) **Govt spending > Taxes**: Most rich countries run deficits and have significant public debt (relative to GDP), particularly after Great Recession of 2008.
Total tax revenues were less than 10% of national income in rich countries until 1900-1910; they represent between 30% and 55% of national income in 2000-2010. Sources and series: see piketty.pse.ens.fr/capital21c.

Source: Piketty (2014)
Federal Revenues and Expenditures, 1930–2011
DIFFERENT LEVELS OF GOVERNMENTS

US Federal govt raises about 20% of National Income in taxes

State+Local govts raise about 10% of Nat. Income in taxes

Decentralized states = states where a larger fraction of taxes/spending take place at local level

Decentralized states give additional power to individuals who can also vote with their feet

Creates competition between local govts: If local govt is inefficient (high taxes and wasteful spending), residents can leave, putting the local govt out of business

Redistribution through taxes and transfers harder to achieve at local level (rich can leave if local taxes are too high)

⇒ Conservatives/libertarians tend to prefer decentralized states
The Distribution of Federal and State Expenditures, 1960 and 2007 • This figure shows the changing composition of federal and state spending over time, as a share of total spending. (a) For the federal government, defense spending has fallen and Social Security and health spending have risen. (b) For the states, the distribution has been more constant, with a small decline in education and welfare spending and a rise in health spending.
DISTRIBUTION OF TAXES

US Federal govt raises about 20% of GDP in taxes, State+Local govt raises about 10% of GDP in taxes.

Main Federal taxes: (1) Individual income tax (40%), (2) payroll taxes on earnings (40%), (3) corporate tax (15%)

Main State taxes: (1) real estate property taxes (30%), (2) sales and excise taxes (30%), (3) individual and corporate state taxes (30%)

Key questions: who bears the burden of those taxes (tax incidence), what impact do they have on the economy?
Another critical role the government plays in all nations is that of regulating economic and social activities. Examples:

1) **Minimum wage** at the Federal level is $7.25 (States can adopt higher min wages) ⇒ Potential impact on inequality

2) The **Food and Drug Administration (FDA)** regulates the labeling and safety of nearly all food products and approves drugs and medical devices to be sold to the public

3) The **Occupational Safety and Health Administration (OSHA)** is charged with regulating the workplace safety of American workers

4) The **Environmental Protection Agency (EPA)** is charged with minimizing dangerous pollutants in the air, water, and food supplies
Taxes, health care, and climate change are each the subject of debate, with both the “liberal” and “conservative” positions holding differing views in their approach to each problem.

**Taxes:** Obama’s administration increased taxes on top earners significantly in 2013 (repeal of Bush tax cuts + Obamacare taxes). New Trump administration wants to reverse these changes and more.

**Health Care:** Up to 2013, about 20% of the non-elderly U.S. population did not have health insurance. Obamacare cut this number down to 10% but might be repealed.

**Climate change:** Carbon emissions are generating global warming with potentially huge negative consequences in the future (sea rise, extreme weather, agricultural output). Debate on costs of global warming. What should govt do?
Recall: Two General Rules for Government Intervention

1) **Market Failures:** Government intervention can help if there are market failures.

2) **Redistribution:** Free market generates inequality. Public cares about economic disparity. Govt taxes and spending can reduce inequality.
Role 2: Redistribution

Even with no market failures, free market outcome might generate substantial inequality.

Inequality matters because people evaluate their economic well-being relative to others, not in absolute terms ⇒ Public cares about inequality.

In advanced economies, people pool 30-50% of their income through their government to fund many transfer programs.

Do taxes and transfers affect economic behavior?

⇒ Generates an efficiency and equity trade-off (size of economic pie vs. distribution of the economic pie).
Income Inequality: Labor vs. Capital Income

Individuals derive market income (before tax) from labor and capital:
\[ z = wl + rk \]
where \( w \) is wage, \( l \) is labor supply, \( k \) is capital, \( r \) is rate of return on capital

1) **Labor income inequality** is due to differences in working abilities (education, talent, physical ability, etc.), work effort (hours of work, effort on the job, etc.), and luck (labor effort might succeed or not)

2) **Capital income inequality** is due to differences in wealth \( k \) (due to past saving behavior and inheritances received), and in rates of return \( r \)

Capital Income (or wealth) is much more concentrated than Labor Income
Macro-aggregates: Labor vs. Capital Income

Labor income $wl \approx 75\%$ of market income $z$

Capital income $rk \approx 25\%$ of market income $z$

Capital stock $k \approx 400 - 500\%$ of market income $z$

Rate of return on capital $r \approx 5 - 6\%$

In GDP, gross capital share is higher (35\%) because it includes depreciation of capital

National Income = GDP - depreciation of capital + net foreign income
Figure 12: Capital shares in factor-price national income 1975-2010

Source: Piketty and Zucman (2014)
The fluctuations of national capital in the long run correspond mostly to the fluctuations of private capital (both in Europe and in the U.S.). Sources and series: see piketty.pse.ens.fr/capital21c.

Source: Piketty (2014)
Income Inequality Measurement

Inequality can be measured by indexes such as Gini coefficient, quantile income shares which are functions of the income distribution $F(z)$

Most famous inequality index: **Gini coefficient**

\[
Gini = 2 \times \text{area between 45 degree line and Lorenz curve}
\]

Lorenz curve $L(p)$ at percentile $p$ is fraction of total income earned by individuals below percentile $p$

\[
0 \leq L(p) \leq p
\]

Gini=0 means perfect equality

Gini=1 means complete inequality (top person has all the income)
Gini Coefficient California pre-tax income, 2000,
Gini=62.1%

Source: Annual Report 2001 California Franchise Tax Board
Key Empirical Facts on Income Inequality

1) In the US, labor income inequality has increased substantially since 1970: debate between skilled biased technological progress view vs. institution view (min wage and Unions) [Autor-Katz’99]

2) Gender gap has decreased but remains substantial especially at the very top

3) In the US, top income shares dropped dramatically from 1929 to 1950 and increased dramatically since 1980

4) Bottom 50% pre-tax income per adult have stagnated since 1980 in spite of a 60% increase in average national income

4) Fall in top income shares from 1900-1950 happened in most OECD countries. Surge in top income shares has happened primarily in English speaking countries, not as much in Continental Europe and Japan [Atkinson, Piketty, Saez JEL’11]
Figure 1: Gini coefficient

Source: Kopczuk, Saez, Song QJE'10: Wage earnings inequality
Men still make 85% of the top 1% of the labor income distribution

Share of women in the employed population, by fractile of labor income

Source: Appendix Table II-F1.
Share of national income going to top 10% adults (pre-tax)

% of national income

Source: Appendix Tables II-B1 and II-C1
Average, bottom 90%, bottom 50% real incomes per adult

Average national income per adult:
61% growth from 1980 to 2014

Bottom 90% pre-tax: 30% growth from 1980 to 2014

Bottom 50% pre-tax: 1% growth from 1980 to 2014
Top 1% and Bottom 50% Adults pre-tax national income shares

% of national income


Top 1%
Bottom 50%
POVERTY RATE DEFINITIONS

1) **Absolute**: Fraction of population with disposable income (normalized by family size) below poverty threshold $z^*$ fixed in real terms (e.g., World Bank now uses $1.90/day in 2011 dollars)

2) **Relative**: Fraction of population with disposable income (normalized by family size) below poverty threshold $z^*$ fixed relative to median (European Union defines poverty threshold as 60% of median)

Absolute poverty falls in the long run with economic growth [nobody in the US is World Bank poor] but relative poverty does not

Absolute poverty captures both growth and inequality effects while relative poverty captures only inequality effects

The fact that inequality stays in the debate in spite of huge growth since 1800 shows that relative income matters (see e.g. Luttmer 2005 for an empirical study)
A billion people were lifted out of extreme poverty between 1990 and 2015.

Number of people living on less than 2005 PPP $1.25 a day (billions)

- Europe & Central Asia
- Middle East & North Africa
- Latin America & Caribbean
- East Asia & Pacific
- South Asia

Forecast
Poverty Rate Disposable Income Definition

Most intuitive notion of poverty is based on consumption $c$ [not pre-tax income $z$]

\[ c = z - T(z) + B(z) + E - s \]

where $T(z)$ is tax, $B(z)$ govt transfers, $E$ net private transfers (charity, family, friends), $s$ is net savings (change in assets)

**Consumption** $c$ is difficult to measure

**Disposable Income** $z - T(z) + B(z)$ [post-tax income] measured in traditional Current Population Survey (CPS)
Ideally, poverty should be defined at the individual level based on individual consumption [e.g., kids better off when mother or grandmother controls income instead of father, Duflo ’03]

However, many consumption goods are shared within the family [e.g., housing, joint meals, etc.] and it is difficult to measure consumption at individual level.

Measured poverty is therefore based on consumption or disposable income at the family level [or unit sharing resources] and everybody within the family has same poverty status.

Bigger families need more resources but economies of scale in consumption: scale disposable income by family size.
US POVERTY RATE DEFINITION

Based on **money income** = market income before taxes + cash govt transfers + cash private transfers

In-kind market income and transfers (employer health insurance, Medicaid, nutrition, public housing) do NOT count

Income and employee payroll taxes are NOT deducted, Income tax credits (EITC, Child Tax Credit) are NOT added

Threshold depends on household size/structure: e.g., $20K/year for single parent with 2 kids

Thresholds adjusted annually using the official CPI
## Poverty Lines by Family Size (2012)

<table>
<thead>
<tr>
<th>Size of Family Unit</th>
<th>Poverty Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$11,170</td>
</tr>
<tr>
<td>2</td>
<td>15,130</td>
</tr>
<tr>
<td>3</td>
<td>19,090</td>
</tr>
<tr>
<td>4</td>
<td>23,050</td>
</tr>
<tr>
<td>5</td>
<td>27,010</td>
</tr>
</tbody>
</table>

For each additional person, add 3,960
The official poverty rate in 2015 was 13.5 percent, down 1.2 percentage points from 14.8 percent in 2014 (Figure 4 and Table 3). In 2015 there were 43.1 million people in poverty, 3.5 million less than in 2014 (Figure 4 and Table 3).

The Office of Management and Budget determined the official definition of poverty in Statistical Policy Directive 14. Appendix B provides a more detailed description of how the Census Bureau calculates poverty. All percentages shown in this report are rounded to one decimal place but differ-ences between estimates are calculated using unrounded numbers. Therefore, published estimates of the differences may not equal the result of subtracting the rounded numbers. In this report, the change in the poverty rate for all people is presented as –1.2 percentage points, resulting from using the more precise estimates of 13.54 percent for 2015 and 14.77 percent for 2014.

The 2015 poverty rate was 1.0 percentage point higher than in 2007, the year before the most recent recession (Figure 4). For most demographic groups, 2015 poverty rates and estimates of the number of people in poverty decreased from 2014 (Table 3 and Table 4).

Between 2014 and 2015, poverty rates decreased for all three major age groups. The poverty rate for children under age 18 dropped 1.4 percentage points, from 21.1 percent to 19.7 percent. Rates for people aged 18 to 64 dropped 1.1 percentage points, from 13.5 percent to 12.4 percent. Poverty rates for people aged 65 and older decreased 1.1 percentage points, from 10.0 percent to 8.8 percent (Table 3 and Figure 5).

Race and Hispanic Origin
For non-Hispanic Whites the poverty rate decreased to 9.1 percent in 2015, down from 10.1 percent in 2014. The number in poverty decreased to 17.8 million, down from 19.7 million. The poverty rate for non-Hispanic Whites was lower than the poverty rates for other racial groups. Non-Hispanic Whites accounted for 61.4 percent of the total population and 41.2 percent of people in poverty (Table 3).

Since unrelated individuals under 15 are excluded from the poverty universe, there were 364,000 fewer children in the poverty universe than in the total civilian noninstitutionalized population.

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>.

declined steadily during this period, falling from 24.6 percent in 1970 to 10.2 percent in 2003.

Other factors may better explain why the poverty rate has failed to fall. Rising numbers of female headed families may offset income gains from women's increasing labor force participation. Increasing income inequality—in particular stemming from declines in wages for less-skilled workers—may have limited the poverty-fighting effects of economic growth. Finally, the level of and changes in government benefits directed toward the nonelderly may explain why the nonelderly poverty rate has not moved in the same direction as elderly poverty. Our task in this paper is to document and quantify the effects of these competing factors to understand recent poverty trends better. Since the steady fall in elderly poverty rates in recent decades is likely explained by other factors such as Social Security (Englehardt and Gruber, 2004), we focus throughout this paper on the conundrum of why the nonelderly poverty rate has failed to decline as the economy has expanded.

**Figure 1**

Trends in Individual Poverty Rates and Real GDP per Capita, 1959–2003


*Note:* The poverty rate data are unavailable for some subgroups for 1960–1965.
Factors Explaining Evolution of Poverty

Based on Hoynes-Page-Stevens JEP’06

1) Increasing pre-tax inequality: stagnant bottom wages in spite of economic growth per capita [large effect]

2) Changes in family structure: single parent families ↑ from 7% in 1967 to 14.4% in 2003 ⇒ Increases poverty rate by 4 pts [large effect]

3) Increase in female labor force participation ⇒ Reduces poverty rate [significant effect only since 1980]

4) Immigration: accounts for about 0.7 points in the poverty rate increase from 1969 to 1999 [small effect]

5) Means-tested transfers [medium effect because they are concentrated below poverty line]
ISSUES WITH US POVERTY RATE DEFINITION

Definition was close to disposable income when measuring poverty started but no longer:

1) In-kind transfers have grown substantially [Medicaid]

2) Payroll tax and Income tax credits (EITC, Child Tax Credit) have grown substantially for low income families

3) Official CPI overstates inflation [and understates real economic growth] because it is not chained [i.e., does not take into account that relative price changes lead to changes in consumption]

Politically difficult to change definition
Recomputing Poverty Rate: Meyer-Sullivan NBER’09

1) Change the scaling for family size (no strong effect)

2) Change the price index: shift to CPI-U-RS instead of official CPI-U (large legitimate effect, CPI-U-RS better index)

3) Shift to households [people living in same unit] instead of family [people in same unit related by blood/adoption]: not clear which is best, depends on sharing [some effect]

4) Shift to after-tax income [deduct income/payroll taxes, add tax credits]: large legitimate effect

5) Add non-cash benefits [nutrition, housing, health insurance]: tiny net effect [medicaid ↑, other programs ↓]

6) Shift to consumption [modest effect on poverty rate, huge effect on deep poverty]
Notes: The rates are anchored at the official rate in 1980. Data are from the CPS-ASEC/ADF. Official Income Poverty follows the U.S. Census definition of income poverty using official thresholds. For measures other than the official one, the threshold in 1980 is equal to the value that yields a poverty rate equal to the official poverty rate in 1980 (13.0 percent). The thresholds in 1980 are then adjusted overtime using the CPI-U-RS. Poverty status is determined at the family level and then person weighted. After-Tax Money Income includes taxes and credits (calculated using TAXSIM). After-Tax Money Income + Noncash Benefits Excluding Home Equity also includes food stamps and CPS-imputed measures of housing and school lunch subsidies, and the fungible value of Medicaid and Medicare. This last series is only available starting with the 1980 CPS-ASEC/ADF. See Data Appendix for more details.

Source: Meyer, Bruce D., and James X. Sullivan (2009)
Measuring Intergenerational Income Mobility

Strong consensus that children’s success should not depend too much on parental income

Studies linking adult children to their parents can measure link between children and parents income

Simple measure: average income rank of children by income rank of parents (Chetty et al. ’14)

1) US has less mobility than European countries (especially Scandinavian countries such as Denmark)

2) Substantial heterogeneity in mobility across cities in the US

3) Places with low segregation, low income inequality, good K-12 schools, high social capital, high family stability tend to have high mobility [this is a correlation and not necessarily causal]
FIGURE II: Association between Children's Percentile Rank and Parents' Percentile Rank

A. Mean Child Income Rank vs. Parent Income Rank in the U.S.

- Rank-Rank Slope (U.S) = 0.341 (0.0003)

B. United States vs. Denmark

- Rank-Rank Slope (Denmark) = 0.180 (0.0063)

Notes: These figures present non-parametric binned scatter plots of the relationship between child and parent income ranks. Both figures are based on the core sample (1980-82 birth cohorts) and baseline family income definitions for parents and children. Child income is the mean of 2011-2012 family income (when the child was around 30), while parent income is mean family income from 1996-2000. We define a child's rank as her family income percentile rank relative to other children in her birth cohort and his parents' rank as their family income percentile rank relative to other parents of children in the core sample. Panel A plots the mean child percentile rank within each parental percentile rank bin. The series in triangles in Panel B plots the analogous series for Denmark, computed by Boserup, Kopczuk, and Kreiner (2013) using a similar sample and income definitions (see text for details). The series in circles reproduces the rank-rank relationship in the U.S. from Panel A as a reference. The slopes and best-fit lines are estimated using an OLS regression on the micro data for the U.S. and on the binned series (as we do not have access to the micro data) for Denmark. Standard errors are reported in parentheses.

Source: Chetty, Hendren, Kline, Saez (2014)
B. United States vs. Denmark

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Source: Chetty, Hendren, Kline, Saez (2014)
The American Dream?

- Probability that a child born to parents in the bottom fifth of the income distribution reaches the top fifth:

<table>
<thead>
<tr>
<th>Country</th>
<th>Probability</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>7.5%</td>
<td>Chetty, Hendren, Kline, Saez 2014</td>
</tr>
<tr>
<td>UK</td>
<td>9.0%</td>
<td>Blanden and Machin 2008</td>
</tr>
<tr>
<td>Denmark</td>
<td>11.7%</td>
<td>Boserup, Kopczuk, and Kreiner 2013</td>
</tr>
<tr>
<td>Canada</td>
<td>13.5%</td>
<td>Corak and Heisz 1999</td>
</tr>
</tbody>
</table>

→ Chances of achieving the “American Dream” are almost two times higher in Canada than in the U.S.
The Geography of Upward Mobility in the United States
Odds of Reaching the Top Fifth Starting from the Bottom Fifth

US average 7.5% [kids born 1980-2]

Note: Lighter Color = More Upward Mobility
Download Statistics for Your Area at www.equality-of-opportunity.org
that much of the variation in upward mobility across areas may be driven by a causal effect of the local environment rather than differences in the characteristics of the people who live in different cities. Place matters in enabling intergenerational mobility. Hence it may be effective to tackle social mobility at the community level. If we can make every city in America have mobility rates like San Jose or Salt Lake City, the United States would become one of the most upwardly mobile countries in the world.

Correlates of spatial Variation

What drives the variation in social mobility across areas? To answer this question, we begin by noting that the spatial pattern in gradients of college attendance and teenage birth rates with respect to parent income is very similar to the spatial pattern in intergenerational income mobility. The fact that much of the spatial variation in children's outcomes emerges before they enter the labor market suggests that the differences in mobility are driven by factors that affect children while they are growing up.

We explore such factors by correlating the spatial variation in mobility with observable characteristics. We begin by showing that upward income mobility is significantly lower in areas with larger African-American populations. However, white individuals in areas with large African-American populations also have lower rates of upward mobility, implying that racial shares matter at the community (rather than individual) level. One mechanism for such a community-level effect of race is segregation. Areas with larger black populations tend to be more segregated by income and race, which could affect both white and black low-income individuals adversely. Indeed, we find a strong negative correlation between standard measures of racial and income segregation and upward mobility. Moreover, we also find that upward mobility is higher in cities with less sprawl, as measured by commute times to work. These findings lead us to identify segregation as the first of five major factors that are strongly correlated with mobility.

The second factor we explore is income inequality. CZs with larger Gini coefficients have less upward mobility, consistent with the "Great Gatsby curve" documented across countries. In contrast, top 1 percent income shares are not highly correlated with intergenerational mobility both across CZs within the United States and across countries. Although one cannot draw definitive conclusions from such correlations, they suggest that the factors that erode the middle class hamper intergenerational mobility more than the factors that lead to income growth in the upper tail.

Third, proxies for the quality of the K–12 school system are also correlated with mobility. Areas with higher test scores (controlling for income levels), lower dropout rates, and smaller class sizes have higher rates of upward mobility. In addition, areas with higher local tax rates, which are predominantly used to finance public schools, have higher rates of mobility.

Fourth, social capital indices—which are proxies for the strength of social networks and community involvement in an area—are very strongly correlated with mobility. For instance, areas of high upward mobility tend to have higher fractions

<table>
<thead>
<tr>
<th>Rank</th>
<th>Commuting Zone</th>
<th>Odds of Reaching Top Fifth from Bottom Fifth</th>
<th>Rank</th>
<th>Commuting Zone</th>
<th>Odds of Reaching Top Fifth from Bottom Fifth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>San Jose, CA</td>
<td>12.9%</td>
<td>41</td>
<td>Cleveland, OH</td>
<td>5.1%</td>
</tr>
<tr>
<td>2</td>
<td>San Francisco, CA</td>
<td>12.2%</td>
<td>42</td>
<td>St. Louis, MO</td>
<td>5.1%</td>
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<td>3</td>
<td>Washington, D.C.</td>
<td>11.0%</td>
<td>43</td>
<td>Raleigh, NC</td>
<td>5.0%</td>
</tr>
<tr>
<td>4</td>
<td>Seattle, WA</td>
<td>10.9%</td>
<td>44</td>
<td>Jacksonville, FL</td>
<td>4.9%</td>
</tr>
<tr>
<td>5</td>
<td>Salt Lake City, UT</td>
<td>10.8%</td>
<td>45</td>
<td>Columbus, OH</td>
<td>4.9%</td>
</tr>
<tr>
<td>6</td>
<td>New York, NY</td>
<td>10.5%</td>
<td>46</td>
<td>Indianapolis, IN</td>
<td>4.9%</td>
</tr>
<tr>
<td>7</td>
<td>Boston, MA</td>
<td>10.5%</td>
<td>47</td>
<td>Dayton, OH</td>
<td>4.9%</td>
</tr>
<tr>
<td>8</td>
<td>San Diego, CA</td>
<td>10.4%</td>
<td>48</td>
<td>Atlanta, GA</td>
<td>4.5%</td>
</tr>
<tr>
<td>9</td>
<td>Newark, NJ</td>
<td>10.2%</td>
<td>49</td>
<td>Milwaukee, WI</td>
<td>4.5%</td>
</tr>
<tr>
<td>10</td>
<td>Manchester, NH</td>
<td>10.0%</td>
<td>50</td>
<td>Charlotte, NC</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

Note: This table reports selected statistics from a sample of the 50 largest commuting zones (CZs) according to their populations in the 2000 Census. The columns report the percentage of children whose family income is in the top quintile of the national distribution of child family income conditional on having parent family income in the bottom quintile of the parental national income distribution—these probabilities are taken from Online Data Table VI of Chetty et al., 2014a. Source: Chetty et al., 2014a.
Govt Redistribution with Taxes and Transfers

Govt taxes individuals based on income and consumption and provides transfers: $z$ is pre-tax income, $y = z - T(z) + B(z)$ is post-tax income

1) If inequality in $y$ is less than inequality in $z \iff$ tax and transfer system is redistributive (or progressive)

2) If inequality in $y$ is more than inequality in $z \iff$ tax and transfer system is regressive

a) If $y = z \cdot (1 - t)$ with constant $t$, tax/transfer system is neutral

b) If $y = z \cdot (1 - t) + G$ where $G$ is a universal transfer, then tax/transfer system is progressive

Actual tax/transfer systems in rich countries roughly like b) with $G$ welfare state transfers [education, health, retirement]
US Distributional National Accounts

Piketty-Saez-Zucman NBER’16 distribute both pre-tax and post-tax US national income across adult individuals.

National income = GDP - depreciation of capital + net foreign income = broadest measure of income.

Pre-tax income is income before taxes and transfers: \( z \)

Post-tax income is income net of all taxes and adding all transfers and public good spending: \( y = z - T(z) + G \)

Both concepts add up to national income and provide a comprehensive view of the mechanical impact of government redistribution.
<table>
<thead>
<tr>
<th>Income group</th>
<th>Number of adults</th>
<th>Pre-tax income</th>
<th>Post-tax income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average income</td>
<td>Income share</td>
</tr>
<tr>
<td>Full Population</td>
<td>234,400,000</td>
<td>$64,600</td>
<td>100%</td>
</tr>
<tr>
<td>Bottom 50%</td>
<td>117,200,000</td>
<td>$16,200</td>
<td>12.5%</td>
</tr>
<tr>
<td>Middle 40%</td>
<td>93,760,000</td>
<td>$65,400</td>
<td>40.5%</td>
</tr>
<tr>
<td>Top 10%</td>
<td>23,440,000</td>
<td>$304,000</td>
<td>47.0%</td>
</tr>
<tr>
<td>Top 1%</td>
<td>2,344,000</td>
<td>$1,300,000</td>
<td>20.2%</td>
</tr>
<tr>
<td>Top 0.1%</td>
<td>234,400</td>
<td>$6,000,000</td>
<td>9.3%</td>
</tr>
<tr>
<td>Top 0.01%</td>
<td>23,440</td>
<td>$28,100,000</td>
<td>4.4%</td>
</tr>
<tr>
<td>Top 0.001%</td>
<td>2,344</td>
<td>$122,000,000</td>
<td>1.9%</td>
</tr>
</tbody>
</table>
Top 10% national income share: pre-tax vs. post-tax

Pre-tax
Post-tax

Source: Appendix Tables II-B1 and II-C1
Average vs. bottom 50% income growth per adult

Average national income per adult:
61% growth from 1980 to 2014

Bottom 50% pre-tax: 1% growth from 1980 to 2014

Bottom 50% post-tax: 21% growth from 1980 to 2014
Federal US Tax System: Overview

1) Individual income tax (on both labor+capital income) [progressive](40% of fed tax revenue)

2) Payroll taxes (on labor income) financing social security programs [about neutral] (40% of revenue)

3) Corporate income tax (on capital income) [progressive if incidence on capital income] (15% of revenue)

4) Estate taxes (on capital income) [very progressive] (2% of revenue)

5) Minor excise taxes (mostly labor income) [regressive] (3% of revenue)
State+Local Tax System: Overview

1) Individual+Corporate income taxes [progressive] (30% of state+local tax revenue)

2) Sales + Excise taxes (tax on consumption = income - savings) [slightly regressive] (30% of revenue)

3) Real estate property taxes (on capital income) [slightly progressive] (30% of revenue)

http://www.census.gov/govs/www/qtax.html
US Tax System: Progressivity and Evolution

1) Medium Term Changes: Federal Tax Progressivity has declined since 1970 but govt redistribution remains substantial especially when including transfers (Medicaid, Social Security, UI, DI, various income support programs)

2) Long Term Changes: Before 1913, US taxes were primarily tariffs, excises, and real estate property taxes [slightly regressive], no transfer programs (and hence small govt)
Tax progressivity has declined since the 1960s

Average tax rates by pre-tax income group

Source: Appendix Table II-G1.

Source: Piketty, Saez, Zucman (2016)
Figure S.13: Average individualized transfer by post-tax income group (including Social Security)

Source: Appendix Table II-G4b.
REFERENCES


Corak, Miles, and Andrew Heisz, “The Intergenerational Earnings and Income Mobility of Canadian Men: Evidence from Longitudinal Income Tax Data,” *Journal of Human Resources*, 34, no. 3 (1999), 504–533. (web)


