

Public Economics for Public Policy
Part VI: Education

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Sciences Po

MPA 2022-2023

Public Goods in Theory

Education: A Quasi-Public Good

Public Goods in Theory

Pure public goods: Goods that are perfectly non-rival in consumption and are non-excludable

Non-rival in consumption: One individual's consumption of a good does not affect another's opportunity to consume the good.

Non-excludable: Individuals cannot deny each other the opportunity to consume a good.

Impure public goods: Goods that satisfy the two public good conditions (non-rival in consumption and non-excludable) to some extent, but not fully.

Defining Pure and Impure Public Goods

		Is the good rival in consumption ?	
		Yes	No
Is the good excludable?	Yes	Private good (Ice cream)	Impure public good or Club goods (Cable TV)
	No	Impure public good or Common-pool resources (Crowded sidewalk, Fish stocks)	Public good (Defense)

The market failure associated with public goods arises from a phenomenon known as free-riding.

A free-rider contributes little or nothing to a public good while benefiting from others' contributions.

Consider the provision of police protection:

You want more, and may even be willing to pay for it

But, nothing is contingent on your payment.

If the good is produced, the crime rate falls, and all residents benefit.

You get that benefit whether or not you pay for it – you get a free ride

⇒ because of the free-rider problem, the private market will undersupply public goods

(Can also be seen as public goods creating a positive externality)

The free rider problem does not lead to a complete absence of private provision of public goods. Private provision works better when:

1. Some Individuals Care More than Others:

Private provision is particularly likely to surmount the free rider problem when individuals are not identical, and when some individuals have an especially high demand for the public good.

2. Altruism:

When individuals value the benefits and costs to others in making their consumption choices.

3. Warm Glow:

Model of public goods provision in which individuals care about both the total amount of the public good and their particular contributions as well.

Laboratory experiments are a great device to test economic theories

Subjects (often students) are brought to the lab where they sit through a computer team game and get paid based on the game outcomes

Many public good lab experiments. Example (Marwell and Ames 1981):

- 10 repetitions for each game. In each game, group of 5 people, each with 10 tokens to allocate between cash and public good. If take token in cash, get \$1 in cash for yourself. If contribute to common good, get \$.5 to each of all five players.

Nash equilibrium: get everything in cash

Socially optimal equilibrium: contribute everything to public good

In the lab, subjects contribute about 50% to public good, but public good contributions fall as game is repeated (Isaac, McCue, and Plott, 1985)

Explanations: people are willing to cooperate at first but get upset and retaliate if others take advantage of them

Why do people cooperate?

In standard economic model, individuals are selfish and hence play Nash and don't cooperate

Yet obvious that humans are social beings that constantly interact and cooperate at many levels (family, work, friends, community, nation, etc.)

Cooperation is innate and supported by sense of fairness and willingness to punish non-cooperators (altruistic punishment)

Likely due to evolutionary adaptation

Many lab experiments have explored "fairness" aspects of human behavior (Fair and Schmidt, 1999)

But these "social" aspects haven't integrated mainstream economics much yet, a serious limitation especially for public economics

Education: A Quasi-Public Good

Why Should the Government Be Involved in Education?

For economists, ex-ante not obvious because education does not look like a public good

1. Returns to education are largely private
2. Education is excludable

⇒ we should expect students to invest roughly the optimal amount in their own education and market forces to supply education services

Fundamental reason: education is long and costly AND everybody needs it in modern Economy

Without government provision, low-income families could not afford it

Why Should the Government Be Involved in Education?

Traditional motives pointed out by economists:

1. Externalities (productivity spillovers, crime, citizenship)
2. Borrowing constraints (poor but talented students may not be able to borrow against future earnings to get an education)
3. (MOST IMPORTANT) Family and individual failures (to conform to standard econ model):
 - a. Some parents may not take good care of their children (public education provides opportunity for all)
 - b. Young adults might not do what is in their long-run interest due to self-control problems or lack of information
 3. implies that education decisions are best made at social level (through govt) rather than individual level

Education is one of the 3 largest programs funded by government (along with retirement and health)

All advanced economies fund most (80% on average) of education (pre-K, K-12, higher ed) through government

⇒ Education level highly dependent on govt policy

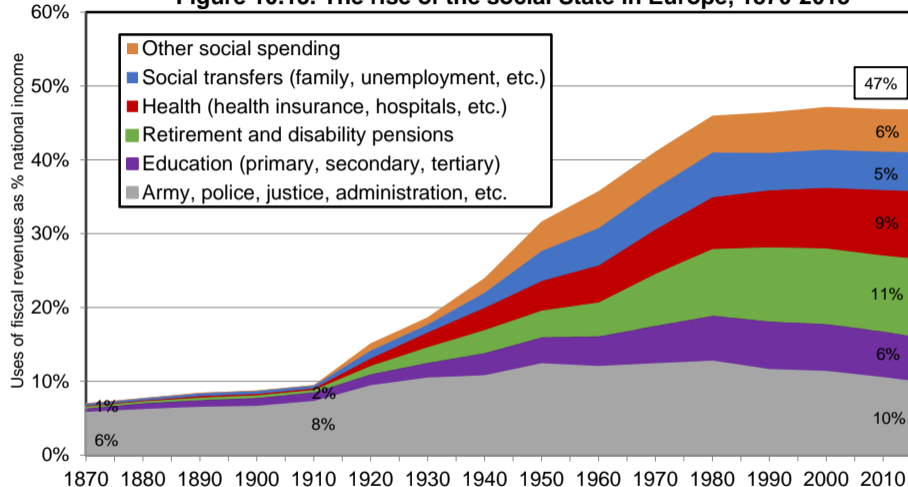
In US, 4.5% of GDP or 1/7 of total government expenditure

In US, 80% of ed spending done at the state and local level

Focus of an extensive body of research in the rapidly expanding field of economics of education

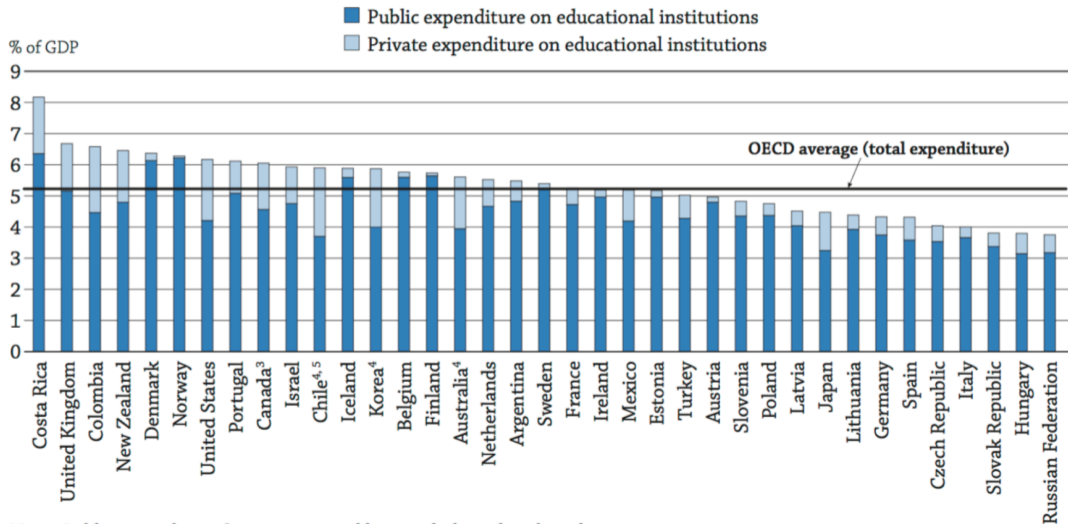
The Rise of the Social State in Europe

Figure 10.15. The rise of the social State in Europe, 1870-2015



Interpretation. In 2015, fiscal revenues represented 47% of national income on average in Western Europe et were used as follows: 10% of national income for regalian expenditure (army, police, justice, general administration, basic infrastructure: roads, etc.); 6% for education; 11% for pensions; 9% for health; 5% for social transfers (other than pensions); 6% for other social spending (housing, etc.). Before 1914, regalian expenditure absorbed almost all fiscal revenues. **Note.** The evolution depicted here is the average of Germany, France, Britain and Sweden (see figure 10.14). Sources and séries: see piketty.pse.ens.fr/ideology.

Public and Private Expenditure on Educational institutions (% of GDP, 2013)



Higher educated people earn more. Two explanations:

1. Education as Human Capital Accumulation

In that scenario, education raises earnings because it improves productivity of the educated person \Rightarrow Education is economically valuable

2. Education as a Screening Device

In that scenario, education provides only a means of separating high-ability from low-ability individuals and does not actually improve skills \Rightarrow education raises individual earnings but it does not improve productivity (rat-race)

Economists' findings: Most of the returns to education reflect primarily accumulation of human capital rather than screening

Basic observational approach:

$$\text{Earnings}_i = \alpha + \beta \cdot \text{Education}_i + \varepsilon_i$$

Amounts to comparing the earnings of high vs. low ed people

Issue: ability to earn ε_i might be correlated with education

Two methods try to control for this bias in estimating the true human capital effects of education

1. Control for underlying ability by adding variables (e.g. SAT score) in the regression so that any remaining effect of education represents true productivity effects (omitted variable bias remains a concern)
2. Find exogenous variation in education (e.g., policy change induces more education for some group but not for another group)

Results: 1 additional year of education raises wages by 7-10% (4-year BA degree increases earnings by 35% relative to High School)

Example: Causal Effect of Majoring in Economics

Descriptive: Economics majors BAs earn more (\$90K) than non-econ BAs (\$66K) at age 40. Is this causal?

Bleemer and Mehta (2021) use GPA threshold requirement (2.8 in Econ 1 and 2) to major in economics at UC Santa Cruz to estimate the causal effect of majoring in economics

Regression Discontinuity Design: compare students just below vs. just above 2.8 threshold

1. Crossing the threshold increases Econ major likelihood by 36 points
2. Crossing the threshold increases wage earnings 5 years after graduation from \$47K to \$55K

⇒ Causal effect of majoring in economics is $(\$55K - \$47K) / .36 = \$22K$ which is an almost 50% earnings premium

Chetty et al. '20 compile college level statistics on parental income and student earnings outcomes. Data online at (web)

1. Access: Huge variation in access across schools: Ivy league has more kids from top 1% families than from bottom 50%

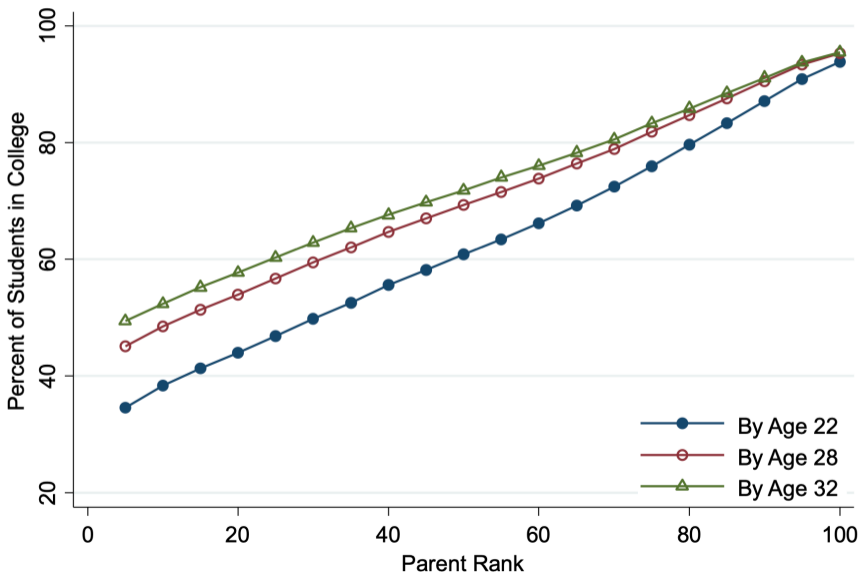
Giving poor kids an SAT point boost in admissions (as done for legacy students) could close gap and increase intergenerational mobility

2. Trends: fraction poor kids stagnated in top schools (in spite of more financial aid) and dropped at best public schools and community colleges

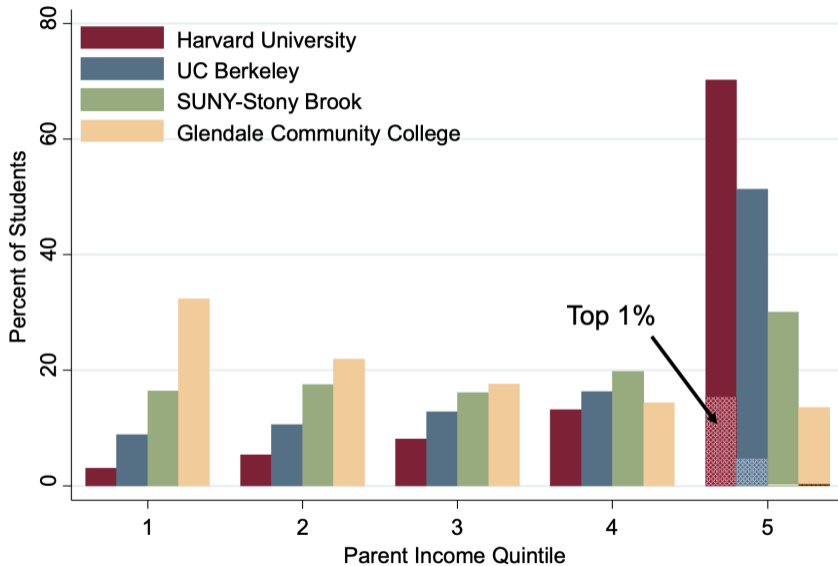
3. Outcomes: Within good colleges, outcomes of poor vs. rich kids are similar \Rightarrow college is the ticket to opportunity

4. Mobility rates: Large discrepancies across colleges in fraction of students who come from bottom 20% and reach top 20% (=mobility rate)

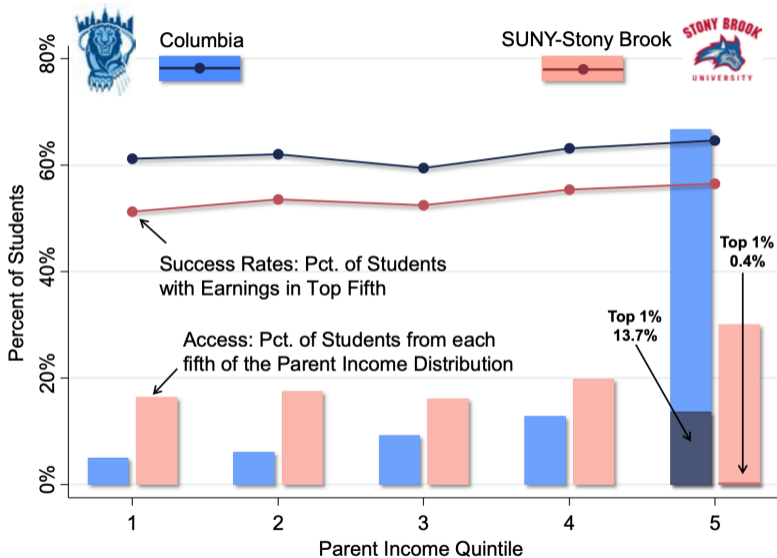
College Attendance Rates by Parent Income and Age



Parent Income Distributions by Quintile for 1980-82 Birth Cohorts



Mobility Report Cards for Columbia and SUNY-Stony Brook



Note: Bars show estimates of the fraction of parents in each quintile of the income distribution. Lines show estimates of the fraction of students from each of those quintiles who reach the top quintile as adults.

THANK YOU!

These slides are available on my website: <https://bluebery-planterose.com/teaching>