

Equalizing opportunities through policy: A primer

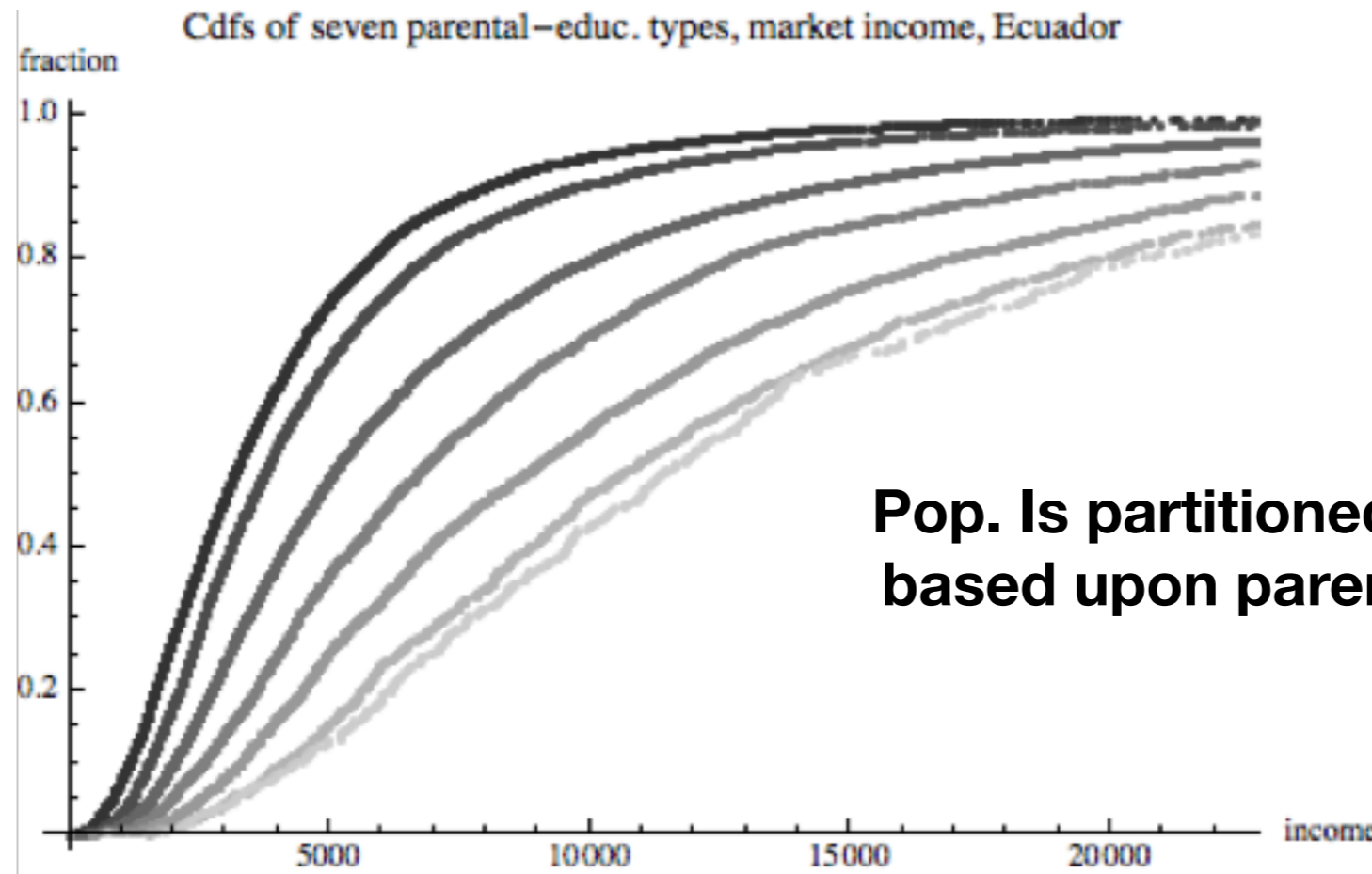
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Two meanings of EOp

- *Meritocracy: fill positions with those best qualified to occupy them
- *Level the playing field: starting-gate equality
- These are quite different conceptions

- Outcomes people achieve are a consequence of *circumstances*, *choice (effort)*, and *policy*.
- *Circumstances* are features beyond control of the agent
- *Effort* comprises choices the agent makes, for which society deems him responsible
- *Policy* is an intervention, typically resource provision
- A *type* is the set of people with the same circumstances. A *typology* is the partition of a society into types.
- Thus we may write $outcome = v(C, e, \varphi)$

Unequal opportunity for income in Ecuador



Pop. Is partitioned into 7 'types' based upon parental education

Purpose of EOp policy is to render these distributions closer together

- Within a type, we attribute differences in outcomes to effort/choice variation. These differences are morally all right.
- Outcomes of individuals in different types are due to both effort and circumstance variation. The effect of circumstances should be nullified.
- But circumstances influence the *distribution of effort* in a type. To sterilize effort of this effect, I measure effort by the *rank* of the individual on the distribution function of his type, and declare two persons in different types as having expended the ‘same’ level of effort if they lie at the same rank.
- But the effort rank will equal the outcome rank, if policy is fixed for all members of a type

- This leads us to propose the program:

- $$\max_{\varphi \in \Phi} \int_0^{\infty} (1 - \max_t F^t(x, \varphi)) dx \quad (\text{Program EOp})$$

- That is, choose the policy that maximizes the area above the left-hand envelope of the outcome-distribution functions of the types

- If the left-hand envelope is the distribution of a given type, then that type is unequivocally the *most disadvantaged type*, and Program EOp simply *maximizes the average outcome of the most disadvantaged type*.

- The main counter-proposal to EOp is **utilitarianism** – to maximize the average outcome, that is:

- $$\max_{\varphi \in \Phi} \int_0^{\infty} (1 - F(x; \varphi)) dx$$

- Where

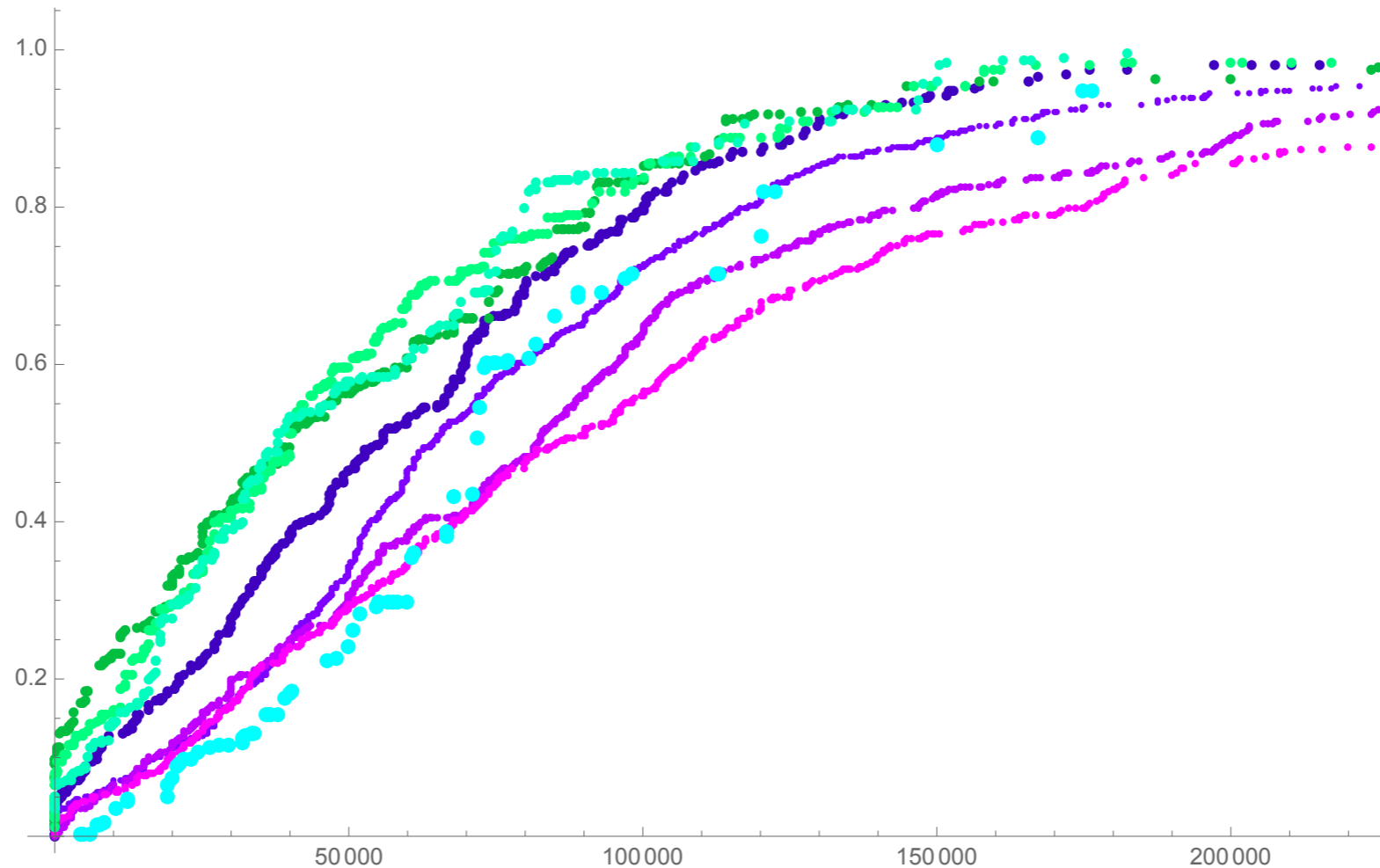
$$F(x; \varphi) = \sum f^t F^t(x; \varphi)$$

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Difference between utilitarianism and EOp

- This notation somewhat obscures an important point: Utilitarianism is concerned *only with outcomes*, and makes no distinction between the relative importance of effort and circumstances in producing the outcome. It is blind to the issue of *responsibility*.
- The EOp doctrine, in contrast, compensates individuals for circumstances beyond their control, while holding them *to a degree* responsible for their choices. EOp is called a ‘non-welfarist’ or ‘non-consequentialist’ theory.

US Income by Parental education and race



We see that only the most advantaged (by SES) black type has incomes that are not stochastically dominated by all four white SES types

Example 2: Allocation of medical resources

- Life expectancy is affected by circumstances (SES), effort (life-style quality) and policy
- Here I contrast the utilitarian and EOp approaches to a medical allocation problem

The problem

- Health-care budget B . Diseases occur in rich and poor, where frequency is a function of circumstance and effort. Generally, raw effort (e.g., life-style quality) is worse among poor than rich
- How to allocate budget on disease treatment to equalize opportunities for life expectancy (across class), or QALYs?

The pop'n is 75% Rich, 25% Poor. The poor have life-styles whose qualities q are uniformly distributed on the interval $[0,1]$, while the rich have life-style qualities that are uniformly distributed on the interval $[0.5, 1.5]$. The probability of contracting cancer, as a function of life-style quality (q) is the same for both types, and given by:

$$s^{CP}(q) = s^{CR}(q) = 1 - \frac{2q}{3}.$$

Only the poor are at a risk of tuberculosis; their probability of contracting TB is:

$$s^{TB}(q) = 1 - \frac{q}{3}.$$

Suppose that life expectancy for a rich individual is given by

$$70, \quad \text{if cancer is not contracted,}$$

$$60 + 10 \frac{x_c - 1}{x_c + 1}, \quad \text{if cancer is}$$

contracted, and x_c is spent on its treatment. Thus, if the disease is contracted, life expectancy will lie between 50 and 70, depending on how much is spent on treatment (from zero to an infinite amount). (This is a simple way of modeling the fact that nobody dies of cancer before age 50.)

Suppose that life expectancy for a poor individual is

$$70 \text{ if neither disease is contracted,}$$

$$60 + 10 \frac{x_c - 1}{x_c + 1} \text{ if cancer is contracted and}$$

x_c is spent on its treatment, and

$$50 + 20 \frac{.1x_t - 1}{.1x_t + 1} \text{ if tuberculosis is}$$

contracted and x_t is spent on its treatment.

We can write the Life Expectancy of the Poor as

$$L^P(\pi, x_C, x_T) = \frac{\pi}{3} \frac{2\pi}{3} 70 + \frac{\pi}{3} \left(1 - \frac{2\pi}{3}\right) \left(60 + 10 \frac{x_C - 1}{x_C + 1}\right) + \left(1 - \frac{\pi}{3}\right) \frac{2\pi}{3} \left(50 + 20 \frac{.1x_{TB} - 1}{.1x_{TB} + 1}\right) \\ \left(1 - \frac{\pi}{3}\right) \left(1 - \frac{2\pi}{3}\right) \min\left[\left(50 + 20 \frac{.1x_{TB} - 1}{.1x_{TB} + 1}\right), \left(60 + 10 \frac{x_C - 1}{x_C + 1}\right)\right].$$

- Here, π is the rank of a Poor person on the life expectancy distribution of the Poor type, and (x_C, x_{TB}) is the per-case expenditure on cancer (C) and (TB).
- For simplicity, I've assumed the life-style distributions are not affected by expenditures.
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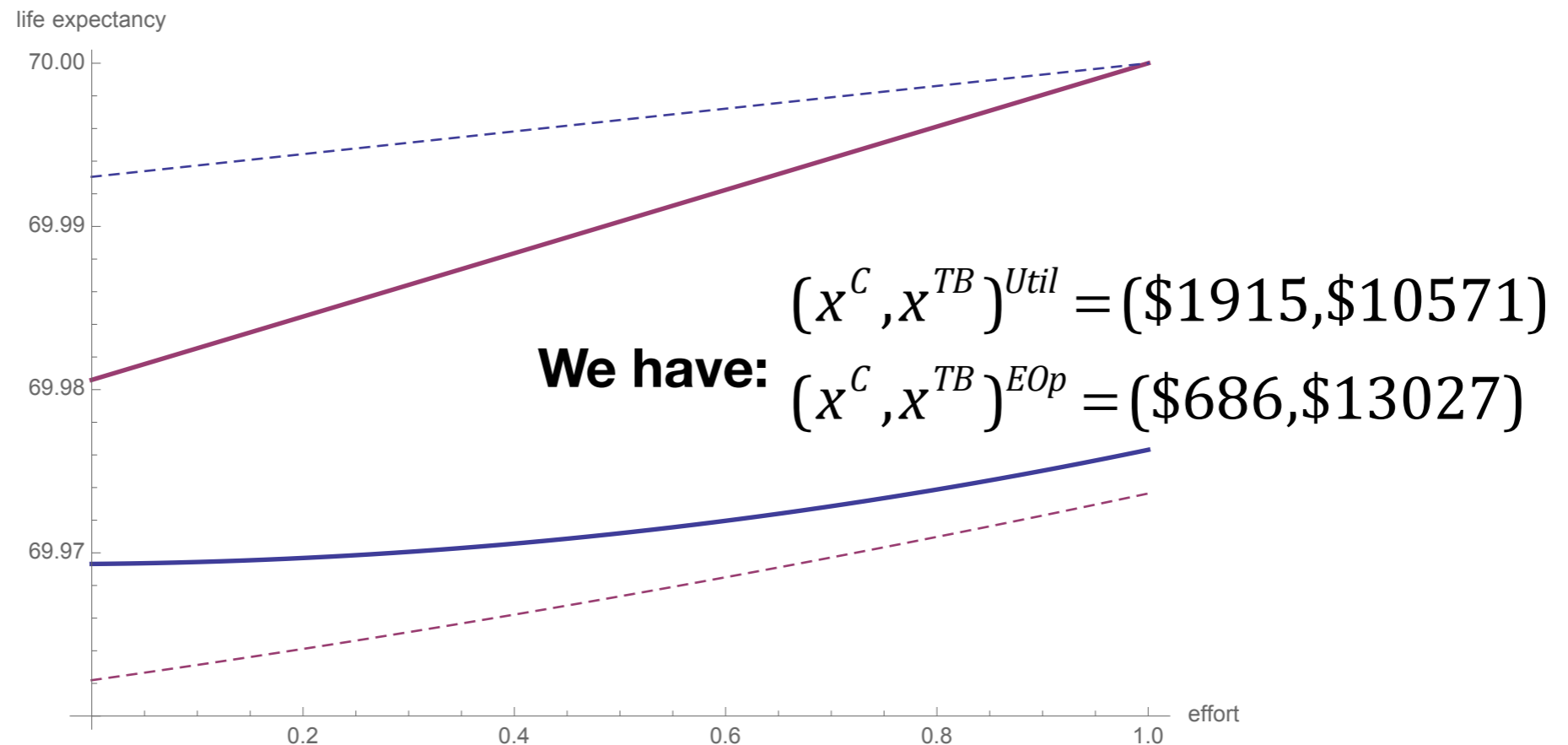
- Notice I assume that *a patient receives the same treatment regardless of his type or life-style*. Thus I embed ‘horizontal equity’ into the policy choice. This also embeds privacy into the policy choice.

- The EOp program is to: $\max_{(x_C, x_{TB})} \int_0^1 L^P(\pi, x_C, x_{TB}) d\pi$.

- This time L^P is the inverse function of the cdf of the L.E. distribution of the poor — one can obviously work with either function



The EOp and Utilitarian solutions



**Dotted lines are LE of Rich & Poor in Utilitarian solution;
Solid lines are LE of R & P in EOp solution**

Example 3: Educational EOp

- Let $Y^t(x^t)$ be the average earnings of a worker who as a child was of type t , and the expenditure on his education was x^t
- The frequency of type t children in the pop is f^t . A simple version of an EOp problem is:

- $$\max_{\mathbf{x}} \min_t [Y^1(x^1), \dots, Y^T(x^t)]$$
$$\text{subj. to } \sum_{t=1}^T f^t x^t \leq M$$

A conservative objection

- A common conservative objection is that this ‘affirmative action policy’ will come at the cost of ‘efficiency,’ where efficiency means the GDP per capita of society. An alternative phrasing: we have to pay attention to what these children will produce for society as adults, not only to how fair the distribution of educational resources was.

- Let's take account of this concern, by adding a constraint to the program:

$$\max \min [Y^1(x^1), \dots, Y^T(x^T)]$$

subj. to

$$\sum_{t=1}^T f^t x^t \leq M$$

$$\sum_{t=1}^T f^t Y^t(x^t) \geq k$$

- The last constraint guarantees that GDP per capita is bounded below by k , which could be the GDP per capita of the status-quo policy

An easy proposition:

Proposition 2. Let $x^* = (x^{1*}, \dots, x^{T*})$ be the status-quo policy. Let $t^* = \arg \min_t Y^t(x^{t*})$,

and suppose t^* is the only type at which the minimum is achieved (surely true at the status quo). Then it is possible to find a feasible direction (not violating the budget M) at x^* which increases Y^{t^*} and GDP per capita if and only if:

(**) there exists $i \neq t^*$ such that $(Y^{t^*})'(x^{t^*}) > (Y^i)'(x^i)$. (Y' is the derivative of Y .)

- In 2014, Johnson, Jackson and Persico estimated the Y functions — unfortunately, only for a typology consisting of High Income and Low Income children. I calculate that the condition (**) of the Proposition is true: that is, shifting educational resources from HI to LI children will increase both GDP per capita and the income of the LI children.
- Thus, there is no conflict (in this case) between the equalizing opportunities for earning capacity and total output.

A caveat

- In recent work, a team I'm a member of created a typology of over 1100 types of worker in the US and the UK. We estimated that about 46% of income inequality in the US is due to 'circumstances,' and 36% in the UK. These are large numbers and show that distributive justice, according to the EOp ethic, is still quite far away.
- The novelty of our typology was to use lots of data on the performance and environments of workers when they were children. Our view is that children should not be held responsible for anything until an 'age of consent' (perhaps 15) is reached. So the biography of the child until 15 is a circumstance.

- One of the co-authors suggested we use brain-scan information as circumstances. I opposed this. Why?
- The ‘causal thesis’ in philosophy denotes the view that every action of a person has a physical representation in the brain. Philosophers who believe in the causal thesis are partitioned into ‘compatibilists’ and ‘incompatibilists.’ The former say that the causal thesis is compatible with personal responsibility; the latter say, it is not. Most philosophers are compatibilists (I am). For a compatibilist, showing that a certain brain state existed says nothing about personal responsibility for the corresponding action.
- IOW, responsibility is a *social* concept, not a biological one. Different societies have different notions of responsibility, and any EOp policy-maker must recommend policies that are consonant with her society’s conception. So we can’t use brain scans or abstract ‘causal factors’ that come out of a factor analysis as circumstances.

Efficiency?

- Many people identify the utilitarian policy with *efficiency*. But this is wrong. Both policies are *Pareto efficient*. What is *socially efficient* depends upon one's ethics. As an egalitarian, I believe the EOp policy is more socially efficient than the utilitarian one.
- *Obviously*, the utilitarian policy achieves a higher average LE than the EOp one — because that is what it maximizes! But averages are not necessarily the ethically relevant summaries of how well a society is doing.