L7: Measuring Inequality and Poverty

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Agenda

- Focus on a topic central to development economics: inequality and poverty
- Start with *measurement* of each of these: conceptual and statistical problems, various indices
- Then discuss some *key facts* about how inequality and poverty vary across the globe, and historical changes
- **Readings:** DR text Ch 6,7,8 relevant sections; BBG Ch 1,4

The Need for Precise Measurement

- Need to evaluate important dimension of development: how unequally is per capita income distributed? what is the extent of poverty?
- Lot of development and aid programs depend on these measures
- Governments are evaluated on the basis of their success in reducing poverty or inequality
- Contentious debates in public policy often center around different measurement methods

Measuring Living Standards: Conceptual Issues

- How should living standards of a given household be measured?
- Problems with *income* measure:
  - Transitory fluctuations, which overstate inequality
  - Lifecycle variations, also overstate inequality
- Better to use *consumption* rather than income for these reasons
- Not ideal: lifetime income or consumption would be better, but this is usually infeasible

Measuring Living Standards: Conceptual Issues, contd.

- Income or consumption both exclude important dimensions of well-being: health, nutrition, environment, vulnerability (India example)
- Should the unit of observation be the household, or further broken down by gender and age?
- Inequality of what? Income/Consumption or Opportunity?
- Inequality or Mobility?

Measuring Living Standards: Statistical Issues

- Reliable measures of income are very difficult to get, especially in LDCs, owing to:
  - weak/nonexistent accounting systems, esp. in rural or informal sector
  - large underground economy
  - problems in valuing assets such as land or real estate
- An added reason for using consumption rather than income

Measuring Living Standards: Statistical Issues, contd.

- Some countries use nutrition-based measures instead for measuring poverty
- Recall problems in household surveys, esp. for nondurable (food or service) items
- Comparability problems across countries: role of standardization of surveys and measures (e.g., World Bank LSMS)

Measures of Poverty

- Usual approach: proportion of households below some *poverty line*
- What should the poverty line be? Nutrition-based? Consumption-based?
- International comparability issues: standard approach is consumption of \$1/1.25 or \$2 per day (PPP adjusted)
- Arbitrary? Corresponds to lowest pci

Head-Count Ratio (HCR) Measure of Poverty

- Head-count ratio is the simplest and most common
- But subject to the Micawber problem in *David Copperfield*
- Provides governments with perverse incentives

Alternative Poverty Measures

- Problem with HCR: ignores *depth* of poverty of the poor
- **Poverty Gap Ratio (PGR)**: mean shortfall from the poverty line (counting the nonpoor as having zero shortfall), expressed as a percentage of the poverty line
- Fancier measures: Foster-Greer-Thorbecke (FGT) family of poverty measures (one of which is HCR*PGR)

Measuring Inequality

- More challenging: measuring inequality
- Usually have data from surveys organized into a household frequency distribution of consumption:
- Use different consumption classes: \$0-100, 101-200, 201-300... etc and provide corresponding frequencies: $n_0, n_1, n_2..$
- How can this entire distribution be reduced to a summary measure of inequality?

Common Measures of Inequality

- **Kuznets ratio:** consumption share of richest 20% of population to that of bottom 20%
- **Coefficient of Variation:** standard deviation of consumption, divided by average consumption
- **Gini Coefficient:** mean pairwise differences of consumption, divided by twice average consumption
- Can get different results, depending on which method is used

Which Inequality Measure to Use?

- Need for some underlying principles to guide choice of inequality measure
- Axioms of Inequality Measurement:
  - Anonymity (depends only on frequency distribution)
  - Invariance to Population Size
  - Invariance to Units
  - Dalton Principle
- Dalton Principle: a redistributive transfer between any pair of households should reduce the inequality measure

Lorenz Curves

- **Fundamental Theorem of Inequality Measurement:** If you believe in these four axioms (and nothing else), you should construct Lorenz curves corresponding to two distributions A and B, say
- Then check if one (A) lies uniformly within the other (B)
- If so you can say that A involves less inequality
- But if the Lorenz curves cross, you cannot compare them

What is the Lorenz Curve?

- It (the y-axis) gives the proportion of aggregate consumption that goes to the poorest $x\%$ of the population
- Then if the Lorenz curve of distribution A is uniformly higher (irrespective of x), it means the poor have a higher share under A *no matter how you define the poor*
- If the Lorenz curves cross, it means that one definition of the poor you get one result, and for another definition you get another result

Table: Example with Four Households and Three Distributions

Household	Dist. A	Dist. B	Dist. C
1	125	75	25
2	225	125	175
3	250	200	400
4	400	600	400

Connection between Lorenz Curve and Gini Coefficient

- *Area of concentration of a Lorenz curve* is the area between the curve and the diagonal (the line of Perfect Equality)
- Gini coefficient equals the ratio of the area of concentration to the area under the diagonal
- Hence if the Lorenz curve of A lies within that of B, the Gini coefficient is smaller in A: here the two ways of assessing inequality match
- But they diverge when the Lorenz curves cross: the Gini coefficients can always be compared, but the Lorenz curves cannot

Partial and Complete Orderings of Inequality

- The requirement of non-crossing Lorenz curves is a conservative way of comparing inequality: a *partial ordering*
- But statistical measures of inequality (KR, CV, Gini) always rank inequality between different distributions: a *complete ordering*
- Kuznets ratio does not satisfy the Dalton Principle, so is not consistent with Lorenz-comparisons
- CV and Gini both satisfy the Dalton Principle, and are both consistent with Lorenz-comparisons

Partial and Complete Orderings of Inequality, contd.

- When the Lorenz curves don't cross, CV and Gini always give the same ranking (text: India, Egypt versus Brazil)
- When Lorenz curves do cross, CV and Gini may give different rankings and then you have a problem (Puerto Rico 1953, 1963: shares of the richest 5% and poorest 40% fell, while middle class gained)
- In practice you may just be using one measure, without being aware of this 'problem'