CRITERIA FOR WELFARE EVALUATION

I. KEY POINTS

- Fuzzy area of economics because it skirts normative issues surrounding "social welfare"

- Also fuzzy because there is no generally accepted/acceptable empirical measures of income inequality

- Still, it's a subject of great interest to economists and non-economists alike, so it merits consideration

II. SOME CANDIDATE CRITERIA

1. Pareto

- At least one person gains and nobody loses

  $\Rightarrow \Delta U^i \geq 0$ **for all i**

- Not terribly interesting (or common) in the context of income distribution in LDC's

2. Kaldor

- **Winners can compensate losers** and still come out ahead

  $\Rightarrow \Sigma_i (\Delta Y_i) > 0.$

- Depends on the (**unrealistic**) assumption that a lump sum transfer from winners to losers can and will be made.

- **Ignores transactions costs and institutional barriers** to effecting compensation of losers

- Rationalizes concentrating on maximizing the overall size of the pie.

III. ATKINSON'S WELFARE MEASURE

The Atkinson measure of income equality: $\mathbf{E = \frac{Y^*}{\overline{Y}}}$,

- $\overline{Y}$ is mean or average income.
- Y* is the income which, if everyone had it, would generate the same level of social welfare as the present distribution of income.
- Y* must be less than the average income ($\overline{Y}$) unless there is perfect equality.
- Social welfare increases if Y* increases (i.e., as the iso-welfare or community indifference curve shifts right)
- By definition, $Y^* = E\overline{Y}$. Hence, social welfare increases if an increase in average income outstrips the fall in E.
- **Problem: How to operationalize this measure?** That is, how to choose a specific social welfare function?

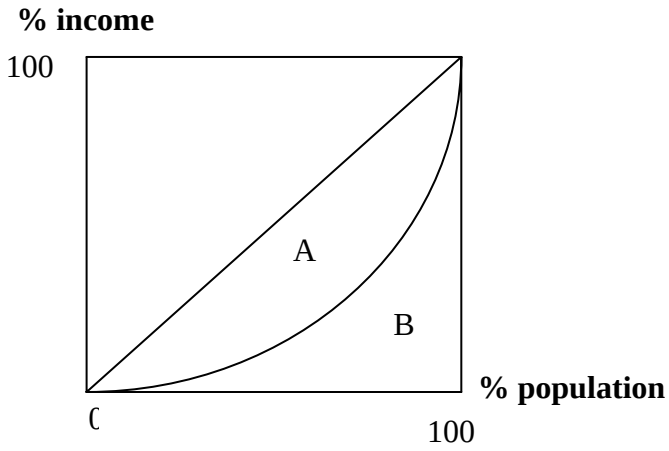
Common Form Used by some Analysts

For two people: $W = \frac{1}{\alpha}(Y^A)^\alpha + \frac{1}{\alpha}(Y^B)^\alpha$, $\quad \alpha < 1$

For n people: $W = \frac{\left(\sum_{i=1}^{n}(Y^i)^\alpha\right)^{1/\alpha}}{\overline{Y}}$

IV. GINI COEFFICIENTS

The Lorenz Curve:



- Any Lorenz curve lying above (within) another Lorenz curve at all points ⇒ an unambiguously more equal distribution of income

- GINI = A/(A+B). In practice GINI's are computed as the sum of areas of triangles and rectangles

Positives:

1. GINI's are **easy to compute**

2. GINI's are **decomposable** – they can be estimated for sub-groups and then aggregated up (e.g., different regions or different land-ownership classes).

Negatives:

1. **Lorenz curves often cross**, in which case the relative inequality of two income distributions is ambiguous.

   ⇒ This happens when one distribution is very unequal in one part of its range (e.g, the bottom) and another is very unequal in a different part (say the top).

2. **GINI is not based on a social welfare measure.**

Note that GINI can be decomposed as

$$G = 1 + \frac{1}{n} - \frac{2}{n^2 \bar{Y}}(Y_1 + 2Y_2 + ... + nY_n),$$

where Y_1 is the income of the richest person, Y_2 the second richest, ... Y_n is the income of the poorest person.

$\Rightarrow$ G corresponds to a welfare function in which the weights attached to individual incomes depend on income **rank**, not on income **size**.

3. **GINIs are generally insensitive to distributional changes**, particularly to changes in the incomes of low-income groups.

Example 1: The Philippines in 1970 (taken from GPRS)

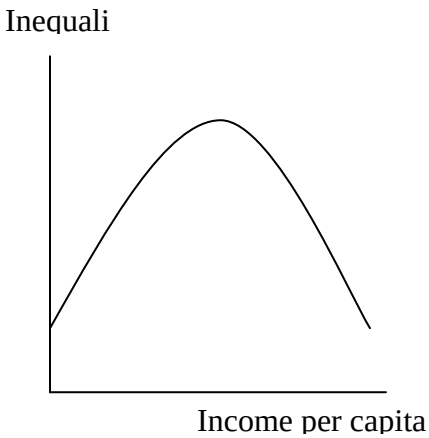
- Lowest 20% of households received only 5.2% of total income
- Top 10% of households received 38.5% of total income
- **Taking 1% of income from the rich group and giving it to the poor group would raise the incomes of the poor by 19%, but would only lower the GINI from .461 to .445 (< 3.5%).**

Example 2: A Hypothetical case (also from GPRS)

Quartile	**Distrib 1**	**Distrib 2**
I	7.5%	13.33%
II	7.5%	13.33%
III	42.5%	13.33%
IV	42.5%	60.00%
Gini Coefficient	.35	.35

INCOME INEQUALITY AND ECONOMIC GROWTH

I. KUZNETS' U-SHAPED CURVE



II. ANALYTICS

Kuznets got his idea from a set of stylized facts about the dynamics of income distribution, population movements, and inter-sectoral differences.

A. Stylized facts

- **"Small high-income islands (of modern production) in a large, low-income sea (of rural production)"**
  - Higher average income/earnings in urban area $\Rightarrow \overline{Y}_U > \overline{Y}_R$.
  - Higher variance of income in urban area $\Rightarrow \text{var}(\overline{Y}_U) > \text{var}(\overline{Y}_R)$.
  - Movement of population from rural to urban sector.

$\Rightarrow$ These insure that even if there is no change in within sector earnings, the Kuznets curve will emerge (see handout).

INTERSECTORAL INEQUALITY DECOMPOSITION

Total income inequality (I) can be decomposed into inequality within the urban sector (I_U), inequality within the rural sector (I_R), and inequality between sectors (I_{RU}):

$$I = I_U + I_R + I_{RU}$$

Using proportional change algebra, growth of total income inequality can be written as:

$$\hat{I} = \frac{I_U}{I} \cdot \hat{I}_U + \frac{I_U}{I} \cdot \hat{I}_R + \frac{I_U}{I} \cdot \hat{I}_{RU}$$

Kuznets asserted that even holding within-sector inequality constant ($\hat{I}_U = \hat{I}_R = 0$), overall inequality will first rise and then fall due to movements of population from the lower-inequality rural sector to the higher inequality urban sector. To see this first note that a simple Gini decomposition of between-sector inequality can be written as:

$$I_{RU} = \frac{n_U \cdot n_R}{\overline{Y}} \cdot (G_U - G_R), \text{ where}$$

n_U and n_R are urban and rural population shares;

$\overline{Y}$ is average income per capita nationwide; and

$G_U - G_R$ is the difference between the urban and rural areas' Gini coefficients.

We can therefore rewrite between-sector income inequality as:

$$\hat{I}_{RU} = \hat{n}_R + \hat{n}_U + (G_U - G_R) - \hat{Y}$$

Because $\hat{G}_U = \hat{G}_R = 0$ (by assumption), $(G_U - G_R) = 0$.

Also, note that since $n_R = 1 - n_U$, $\hat{n}_R = -\frac{n_U}{n_R} \cdot \hat{n}_U$. Thus, we can rewrite between- sector inequality as

$$\hat{I}_{RU} = \hat{n}_U - \frac{n_U}{n_R} \cdot \hat{n}_U - \hat{\bar{Y}} = \left(1 - \frac{n_U}{n_R}\right) \cdot \hat{n}_U - \hat{\bar{Y}}$$

Interpretation

At early stages of development, most people live in rural areas and $\frac{n_U}{n_R}$ is small. As urbanization occurs, $\frac{n_U}{n_R}$ grows up to the point where $1 - \frac{n_U}{n_R} < 0$. Thus, in the early stages of development, $\hat{I}_{RU}$ is unambiguously positive, i.e., inequality grows. Over time, $\hat{I}_{RU}$ becomes negative and inequality declines.

Note: It can be shown that $\hat{\bar{Y}}$ is always smaller than $\left(1 - \frac{n_U}{n_R}\right) \cdot \hat{n}_U$, so we ignore it here.

For $\frac{\bar{Y}_U}{\bar{Y}_R} = 4$, $\hat{I}_{RU} > 0$ if $n_U < .33$

For $\frac{\bar{Y}_U}{\bar{Y}_R} = 3$, $\hat{I}_{RU} > 0$ if $n_U < .37$

For $\frac{\bar{Y}_U}{\bar{Y}_R} = 2$, $\hat{I}_{RU} > 0$ if $n_U < .41$

III. FIELDS' TYPOLOGIES OF DEVELOPMENT & DISTRIBUTION

- Traditional sector enrichment ("a")
- Modern sector enrichment ("b")
- Modern sector enlargement ("c")

A. Model setup

- Dualistic setup, akin to Kuznets'
- Assumes that $W_{MOD} > W_{TRAD}$.

$$Y = Y_{MOD} + Y_{TRAD} = W_{MOD} \times L_{MOD} + W_{TRAD} \times L_{TRAD}$$

"b" "c" "a" "c"

B. Traditional sector enrichment

$W_{TRAD} \uparrow \Rightarrow Y_{TRAD} \uparrow \Rightarrow$ Lorenz improvement

Other outcome: $Y_{TOT} \uparrow$

B. Modern sector enrichment

$W_{MOD} \uparrow \Rightarrow Y_{MOD} \uparrow \Rightarrow$ Lorenz worsening

Other outcome: $Y_{TOT} \uparrow$ as in traditional sector enrichment.

D. Modern Sector Enlargement

- Those remaining in the traditional sector have same per capita incomes, but there are less of them and a larger <u>total</u> income

  $\Rightarrow$ **$L_2 < L_1$ up to** L^2_{MOD} **.**

- Likewise, in the modern sector, incomes per capita are the same but total income is larger so that each person in the modern sector receives a small fraction of total income than before.

  $\Rightarrow$ **Slope of L_2 < slope of L_1 beyond** L^2_{MOD} **.**

- **Implication: Lorenz curves cross.**

The crossing Lorenz curves are artifact of the Kuznets process

- We've already seen this with a Gini decomposition approach
- Fields sketches out a similar heuristic argument using share of poorest X%. **[Handout]**

$\Rightarrow$ Income accruing to the poorest X% falls continuously until the modern sector includes (1-X)% of the population.

EXAMPLE of MODERN SECTOR ENLARGEMENT

Let $\overline{Y}_R = 40$ and $\overline{Y}_U = 100$, $n_R = n_U = 50$.

$\Rightarrow Y_{40\%} = 1600,\ Y_{TOT} = 7000,\ \frac{Y_{40\%}}{Y_{TOT}} = 22.86\%$

Now let ten people move from R to U $\Rightarrow n_R = 40, n_U = 60$:

$\Rightarrow Y_{40\%} = 1600,\ Y_{TOT} = 7600 \Rightarrow \frac{Y_{40\%}}{Y_{TOT}} = 21.05\%$. **This is the nadir.**

If one more rural person moves, $n_R = 39, n_U = 61$:

$\Rightarrow Y_{40\%} = 1660,\ Y_{TOT} = 7660 \Rightarrow \frac{Y_{40\%}}{Y_{TOT}} = \frac{39 \cdot 40 + 1 \cdot 100}{39 \cdot 40 + 61 \cdot 100} \frac{1660}{7660} = 21.67\%$.

EMPIRICAL STUDIES OF ECONOMIC GROWTH

Kuznets spawned a huge empirical literature on growth and income distribution. Indeed, his presidential address was more or less an agenda for his own research over the next decade or so.

I. CROSS-SECTIONAL STUDIES

Common methodology includes:

(1) Measuring inequality in each country.

(2) Measuring other characteristics (esp. GNP, $\hat{GNP}$, ag, edu).

(3) Relating the two.

$\Rightarrow$ I = f(GNP, $\hat{GNP}$, Ag. Share, Education, etc.)

A. Kuznets himself (1963 – 18 countries)

- Share of upper income groups much larger in LDC's than in DC's.
- Share of lowest-income groups in LDCs somewhat less than DC's.

B. Adelman and Morris (1973 – 43 countries)

- All LDCs experience significant decrease in the income share of the poorest 60% when development begins.

- Share of the lowest 20% and 40% continues to decline – **although more slowly** – for a substantial portion of the development process.

- Whether or not the income share of the poor turns up again depends on policy choices made by governments [**more on this later]**

C. Other studies

- All tend to support Kuznets' U shaped curve, with inequality rising at early stages of development, falling in the middle and late stages.

- But the proportion of variation in income inequality that is explained by income is <u>small</u>

- Effects of other factors (Chenery & Syrquin):
  - Education, $\hat{N}$, Ag Share $\downarrow$ all **lower inequality**
  - Increased share of Ag Exports in total exports **raises inequality.**

- Socialist countries tended to have lower inequality $\Rightarrow$ **policy matters.**

D. Deficiencies of cross-sectional studies

1. The **U-curve is inherently a dynamic process** – i.e., inequality grows and falls as the development process unfolds – yet **cross-sectional analyses are simple <u>snapshots</u>.**

   - The **maintained hypothesis** is that all developing countries follow more-or less the same development pattern.

   - This abstracts mightily from **important differences in resource endowments, history, culture, and policies.**

⇒ We don't really know what the path looks like for any of the countries represented by each point.

2. **Explanatory power of Y on I is low in most cases**
   ⇒ there's alot more going on.

3. **Pretty darned ad hoc** ⇔ not terribly informative.

II. TIME SERIES EVIDENCE

- More limited number of studies.

- Mixed results: Sometimes negative, sometimes positive relationship between inequality and income.

- Lipton & Ravallion: "Current consensus is that several factors influence the impact of economic growth on inequality:

1. Initial distribution of physical and human assets/capital
2. Preferences of citizens, politicians over consumption vs. savings.
3. Degree of openness of the economy
4. Government redistributive policies.

Handout: Alternative Patterns of Inequality and Growth

III. RE-EVALUATION OF THE INEQUALITY AND GROWTH

$$I = I_R + I_U + I_{UR} \quad \Rightarrow \quad \hat{I} = \frac{I_R}{I}\hat{I}_R + \frac{I_U}{I}\hat{I}_U + \frac{I_{UR}}{I}\hat{I}_{UR}$$

Relaxing the assumptions (Adelman and Robinson)

1. $\hat{I}_R \neq 0$

- Adelman and Robinson claim that $\hat{I}_R > 0$ at least initially in nearly all cases. The way around this is through policies that:
  a. Increase productivity of small farms.
  b. Redistribute land from large landholders.
  c. Increase rural, non-agricultural employment opportunities.

- "The only non-socialist countries (other than city states) that have avoided this initial widening have been South Korea and Taiwan, where initial land reforms redistributed land to the tillers and substantial productivity increases in agriculture occurred early in the industrialization process."

- **Puzzle:** Adelman's claim that $\hat{I}_R > 0$ is at odds with the (seemingly) clear implications of Fields' "traditional sector enrichment.

  Why?

  (a) There is considerable **heterogeneity within the traditional sector**, not simply an amorphous blob of poor people.

  (b) Possibly a confusion between **short-run** (in which the rich almost <u>always</u> win) **vs. long-run** effects of ag productivity changes. In fact $\hat{I}_R$ may be negative over the medium run.

2. $\hat{I}_U \neq 0$

- Adelman claims that where industrialization relies on import substitution, $\hat{I}_U > 0$

  Reason: Policies typically used to promote **import substitution** – capital subsidies, minimum wages – tend to create high unemployment which **leads to dualistic development within the urban sector (i.e. the urban informal sector).**

- **Two options for reducing I_U:**
  - Promotion of labor intensive industries.
  - Access to education.

3. $\hat{I}_{RU}$ **Reconsidered:**

$$\hat{I}_{RU} = \hat{n}_R + \hat{n}_U + (\hat{G}_U - G_R) - \hat{Y} = \left(1 - \frac{n_U}{n_R}\right) \cdot \hat{n}_U + (\hat{G}_U - G_R) - \hat{Y}$$

- Key assumption had to do with the composition of the migration stream. Three key points here:

  (a) The HT model: Given much higher urban wages, rural workers will migrate until expected earnings are the same ⇒ **urban unemployment**. This **will tend to lower I_{RU}** *ceteris paribis* because (1) average income in urban areas will be lower than if full employment prevailed; and (2) supply shift would tend to lower urban wage relative to rural wage. However, **urban unemployment** also tends to increase I_U ⇒ **negative correlation between I_{RU} and I_U.**

  (b) Considerable evidence that a second major component of the migrant stream is **well-to-do in search of education OR brain drain** from rural areas.

  (c) Derivation of the u-shaped I_{RU} hinged on **assumption that rural-urban migrants exactly reflected the distribution of I_R.** This need not have been the case.

  (d) The overall share of **I_{RU} may be small compared to I_U and I_R** ⇒ the impulse to "U-ness" may be swamped by within-sector inequality.

- Don't forget the $(\hat{G}_U - G_R)$ term in the decomposition. If $G_U \uparrow$ or $G_R \downarrow$ (or constant) then the "U: turns to a "J".

III. **POVERTY AND GROWTH**

- Even where growth has been associated with rising inequality, **poverty has typically fallen**.

- Best recent evidence is in **Ravallion and Datt**'s study of **India**. They regressed poverty measures on various measures of income and found:

1. **Rural income growth strongly contributes to lowering poverty nationally, within rural areas, and within urban areas.**

2. Neither urban income growth or movements of population from rural to urban areas had a significant effect on national poverty.

3. **Urban growth lowered poverty <u>AND</u> raised inequality in urban areas.**

4. **Sectoral growth matters:** Growth in both primary (ag) and tertiary (service) sectors was poverty reducing. Growth in the secondary sector (const. and manufacturing) had no significant effect.

FINAL THOUGHTS

In periods of disequilibrium, it is probable that better off (richer) segments of society will take advantage of new circumstances by virtue of:

1. Greater ability to take risks (entrepreneurship)
2. Greater ability to process information (education)
3. Superior access to capital/credit
4. More savings (if negative shock)