

Economic Inequality and Income Distribution

Lecture 2-1

EE461 – 2/2021

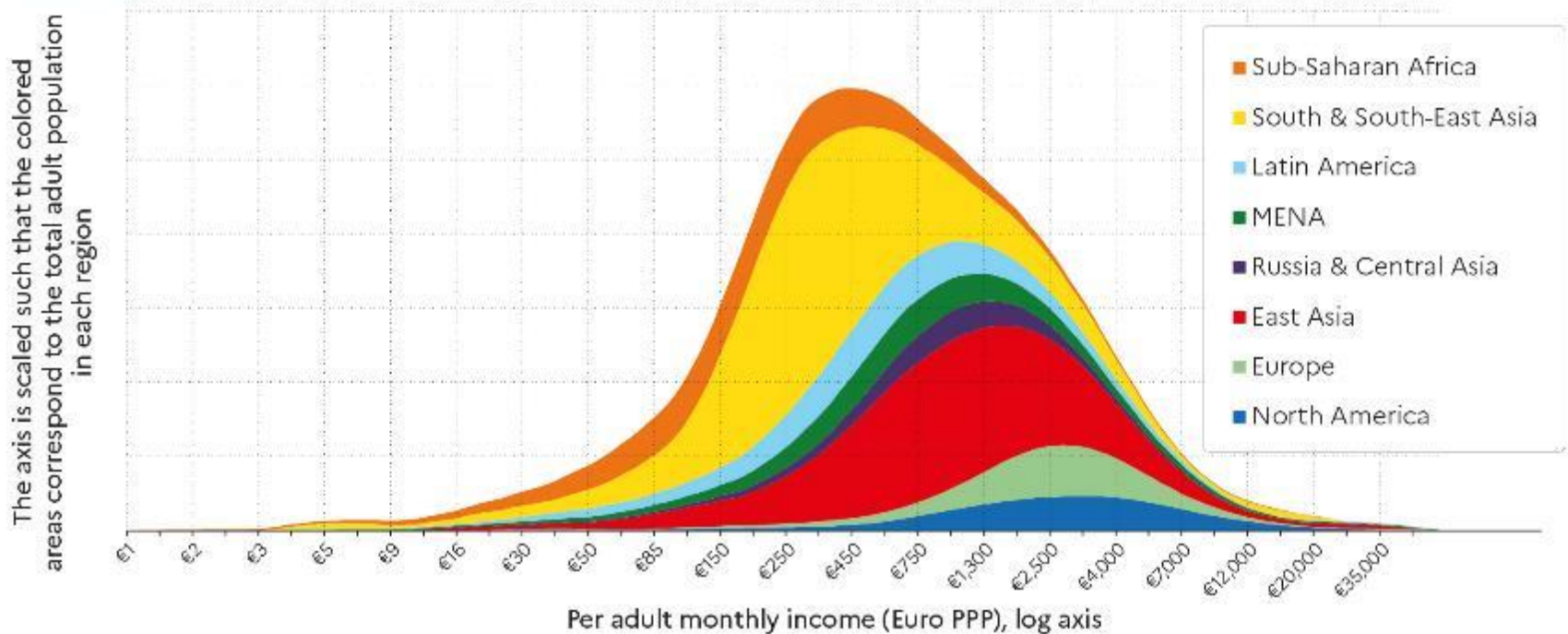
Chayanee Chawanote

Outline

- Measurement of Income Inequality (#2-1)
- Kuznets' curve: inverted-U hypothesis (#2-1)
- Inequality, saving, income, and growth (#2-2)
- Inequality, capital markets, and development (occupational choice model) (#2-2)
- Inequality and Covid-19 (#2-3)

Income distribution

Figure 1.7 Global income distribution in 2021



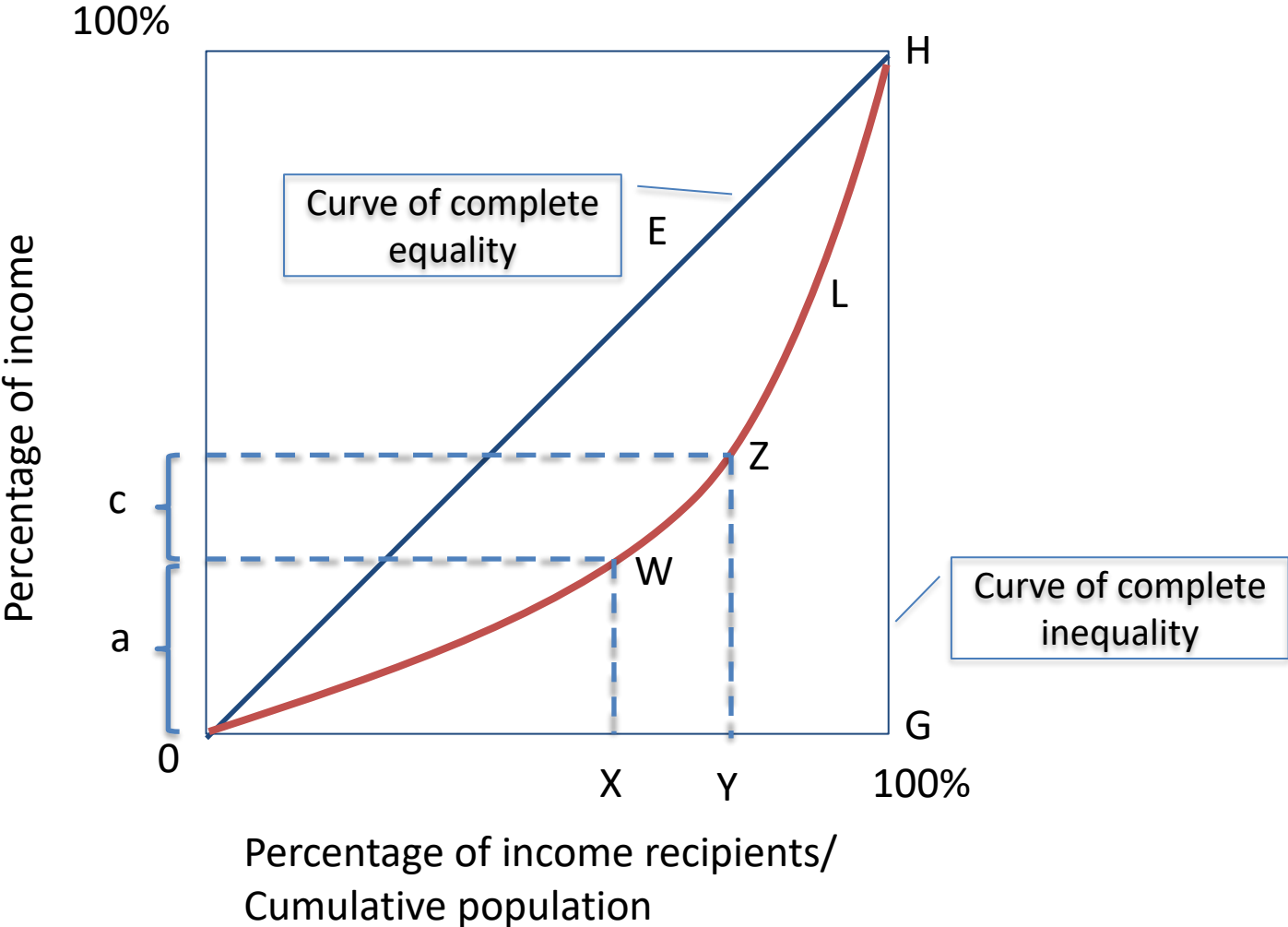
Interpretation: The graph shows the size and geographical repartition of the global population at different levels of the income distribution. The relative size of each color wedge is proportional to the population in a region. Incomes are measured after pension and unemployment benefits are received by individuals, and before income and wealth taxes. **Sources and series:** wir2022.wid.world/methodology.

Measurement of Income Inequality

- Popular measures:
 - The ratio of the share of income received by the 10th decile (richest 10 percent) of households (HH) to the share of income received by the first decile (poorest 10 percent) of HH (The Kuznets ratios).
 - Use the richest x percent and the poorest x (or y) percent (see table in Lecture 1)
 - Lorenz curve: plot the percentage of a country's income received by the poorest x percent of HH against x.
 - Gini coefficient: based on area under Lorenz curve
- <https://inequalitylab.world/en/>
- <https://wir2022.wid.world/> - World Inequality Report 2022
 - <https://wir2022.wid.world/executive-summary/>

Measurement of Income Inequality

The Lorenz Curve

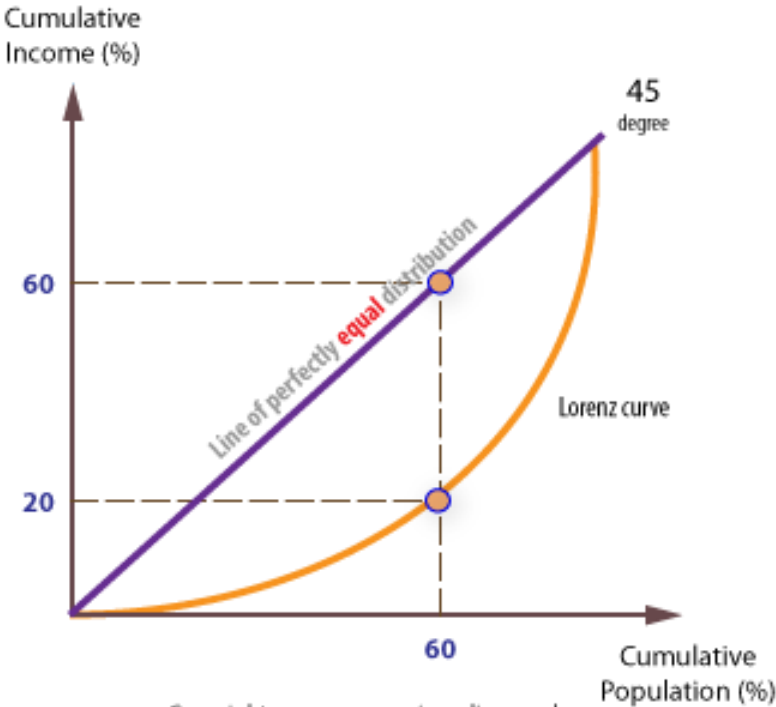


Measurement of Income Inequality

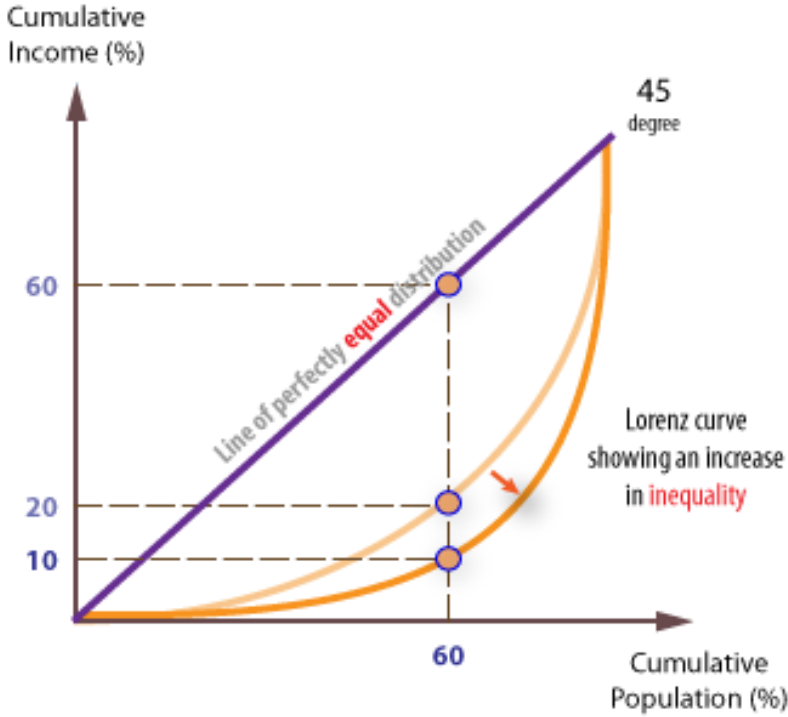
Lorenz curve:

- OX percent of HH (the poorest group) receives a percent of income, and so on, giving the Lorenz curve L.
- Complete equality occur only if a percent of HH received a percent of income, yielding the curve of E.
- The curve of perfect inequality is OGH. One household has 100 percent of country's income.
- The points on the Lorenz curve are the percentage of income received by the poorest 10 percent of HH, and so on.
- Distribution α dominates distribution β if the Lorenz curve of α lies above that of another income distribution β for at least one point and never lies below it.
- Lower inequality implies higher welfare.

Measurement of Income Inequality



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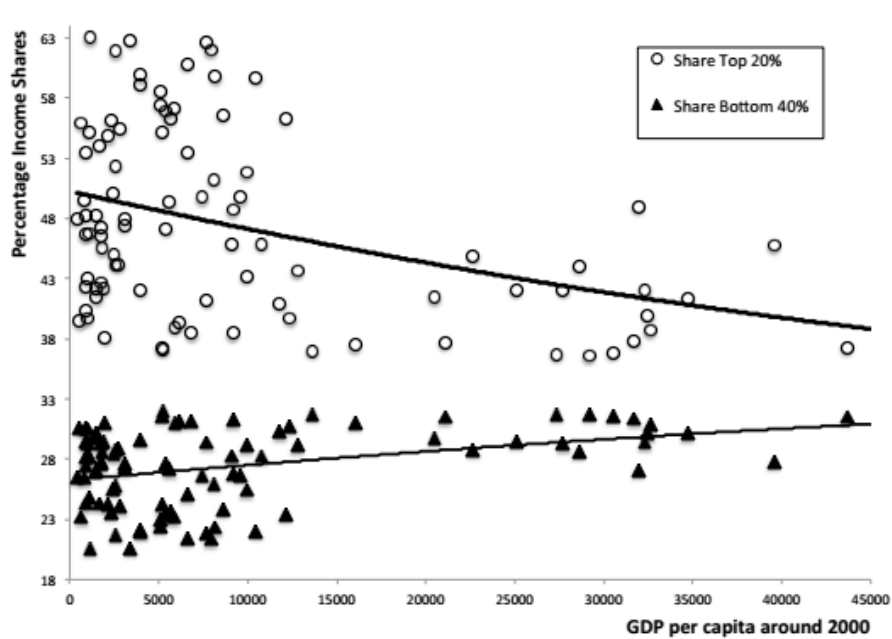


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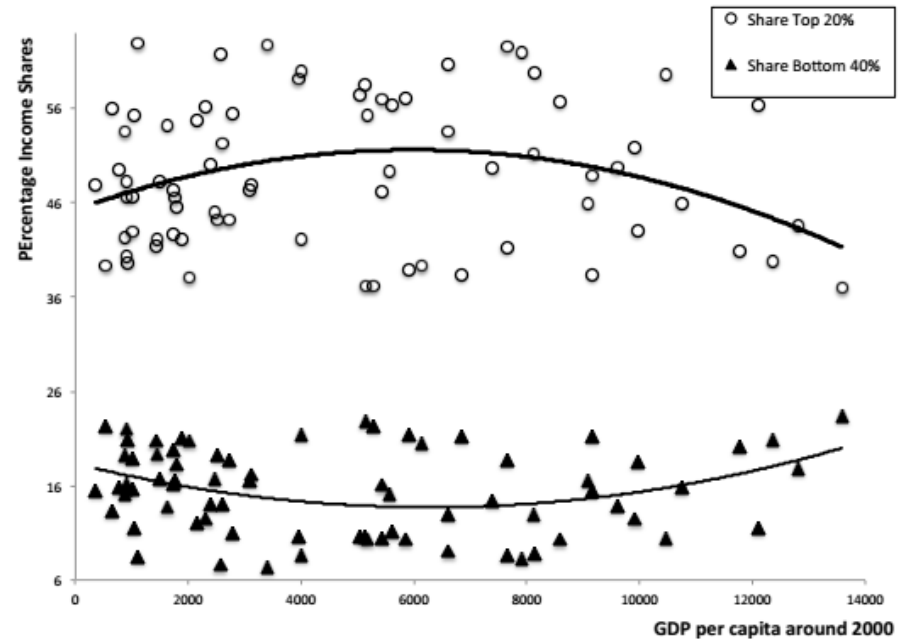
Measurement of Income Inequality

- Lorenz curves cannot be compared inequality of income distributions when the Lorenz curves cross.
 - use Gini coefficient
- **Gini coefficient:** the ratio of the shaded area, enclosed by the line of theoretical equality E and the observed Lorenz curve L, to the total area under the line of equality.
 - Gini coefficient ranges from 0 to 1.
 - The larger the coefficient, the greater the inequality.
 - If one income distribution Lorenz dominates another, its Gini coefficient will be smaller.
 - <https://data.worldbank.org/indicator/SI.POV.GINI?view=map&year=2018>

Income shares of poorest 40% and richest 20% in various countries



(A) The full range of per-capita GDP



(B) Per-capita GDP below \$15,000

Source: Ray Ch.2

Inequality, Income, and Growth

- **Inverted-U hypothesis**

- Kuznets (1955) used the ratio of the income share of the richest 20% of the population to that of the poorest 60% of the population as a measure of inequality
- Result: developing countries tend to possess higher degrees of inequality than their developed counterparts.
- Implication: economic development is fundamentally a sequential and uneven process. The process appears to pull up certain groups first and leave the other groups to catch up later. Hence, in the initial phase, inequality widens and later falls when everybody else catches up.

Inequality, Income, and Growth

Kuznets (1995)'s curve mechanisms:

- Movements of workers from agriculture to industry
- Industrial sector characterized by higher mean income and a higher degree of inequality
- When industry is small, this leads to increased inequality
- As the industry grows inequality starts decreasing

Testing Inverted-U hypothesis

- Still lack of reliable data to track an individual country's inequality over time >> use cross section data instead
- Pro: data can be obtained for different countries at widely different stages of development
- Con: need a systematic way to control for intercountry variation

Inequality, Income, and Growth

- Ahluwalia (1976) analyzed 60 countries: 40 developing, 14 developed, 6 socialist. Divide the population of each country into 5 quintiles, then run the regression:

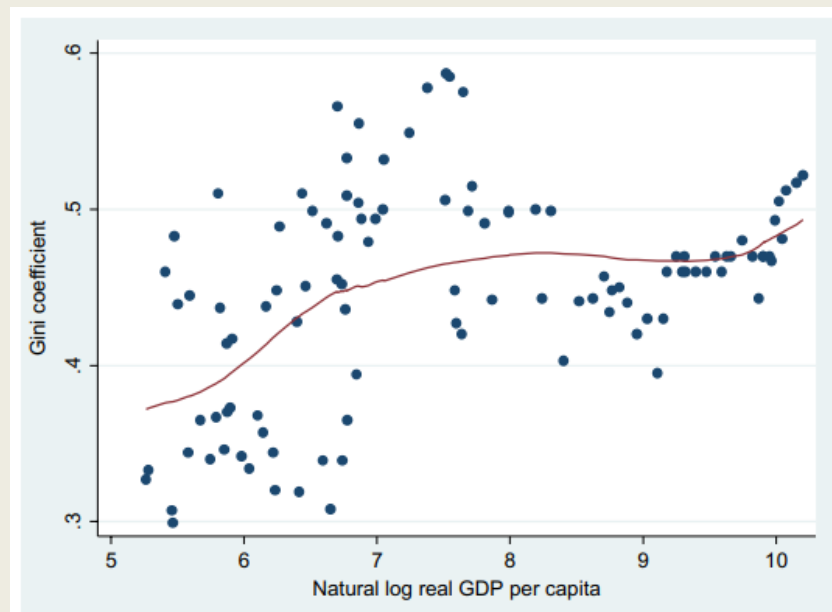
$$s_i = a + by + cy^2 + D + \text{error}$$

s_i is the income share of the i th quintile

y is the logarithm of per capita GNP

D is a dummy variable = 1 if the country is socialist

- the inclusion of the squared term permits a fit that changes direction



Further reading:
Kuznets' process in SEA (2015)
The analysis suggests the existence of a Kuznets' curve with respect to per capita income; the path of inequality is nonlinear with respect to economic development.

Kuznets' process in SEA (2015)

Abdullah et al. (2015) Singapore Economic Review 60(2)

4.3. Econometric specification

The standard way to explore the Kuznets hypothesis using panel data is to estimate the following equation⁵:

$$I_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 GDP_{it}^2 + u_{it}, \quad (1)$$

where I is an inequality index, GDP is GDP per capita at constant price, u is the error term, and i and t denote country and time. Panel data versions also can include either fixed or random effects. Kuznets' hypothesis is confirmed if the coefficient of explanatory variables and its square have positive and negative signs respectively. However, the estimated turning point is also important in identifying the *practical* importance of Kuznets' curve: The estimated turning point indicates the level of growth at which inequality starts to diminish. If the turning point occurs outside the observed range, then evidence in favor of the hypothesis becomes dubious.

Equation (1) represents the *unconditional* version of the Kuznets hypothesis, as it does not include any other explanatory variables. Kuznets' hypothesis is only one factor shaping the path of inequality.

Table 4. Inequality and lnGDP per Capita: Pooled OLS

	Constant (1)	lnGDPPc (2)	lnGDPPc ² (3)	Adjusted <i>R</i> ²	Wald Test	Support Kuznets' Hypothesis?
Five main countries (<i>n</i> = 95)	-0.396** (-2.03)	0.208*** (4.12)	-0.012*** (-3.87)	0.200	14.148 [0.00]	Yes
All countries (<i>n</i> = 107)	-0.370** (-2.01)	0.200*** (4.13)	-0.012*** (-3.81)	0.253	16.90 [0.00]	Yes
Excluding Singapore (<i>n</i> = 72)	-0.952*** (-2.10)	0.368*** (2.76)	-0.024*** (-2.43)	0.306	18.56 [0.00]	Yes

Notes: Figures in brackets are t-statistics using robust standard errors. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. The Wald test provides a test for the joint statistical significance of the linear and non-linear terms. Figures in square brackets are prob-values. *n* denotes the number of observations. The first set of pooled OLS results relate to the 5 main countries (Indonesia, Malaysia, Philippines, Singapore and Thailand). The second set of results includes also Laos, Cambodia and Vietnam. The final set of results excludes Singapore.

Inequality, Income, and Growth

- **Comments on Inverted-U hypothesis**
 - Problem with cross-sectional studies: the implicit assumption is that all countries have the same inequality-income relationship
 - Countries are different, but there is still some connection between their inequality-income curves >> do estimation by adding country-specific dummy variables that move the intercept term of the estimated curve (if we have time series data of inequality for each country).
 - “Latin effect”: most of the high-inequality middle-income countries are Latin American. Hence, the inverted-U is just an artificial consequence of the Latin American countries sitting in the middle.
 - There are many factors (policies, structural differences across countries) that are left out from the tests.
 - With panel data and country-specific dummies, the Kuznets inverted-U hypothesis largely vanishes: the coefficients are not significant.