

Inequality

Measuring poverty: Foster-Greer-Thorbeck (FGT) Index

- FGT Index: N : Population, H : Head accounts for the poor, z : Poverty Line, c_i : Living standard of the poor i , $P\alpha$: Poverty Index (If $\alpha=0$, then the *poverty ratio*, If $\alpha=1$, then *poverty gap*, if $\alpha=2$ then *Squared poverty gap*.....)

$$P\alpha = \frac{1}{N} \sum_{i=1}^H \left(\frac{z - c_i}{z} \right)^\alpha \times 100$$

Measuring the poverty (2)

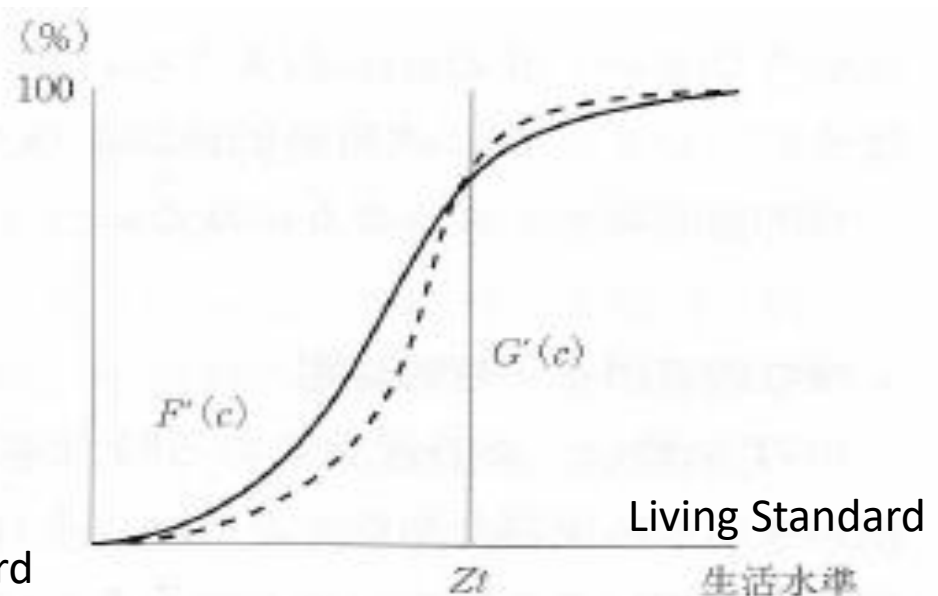
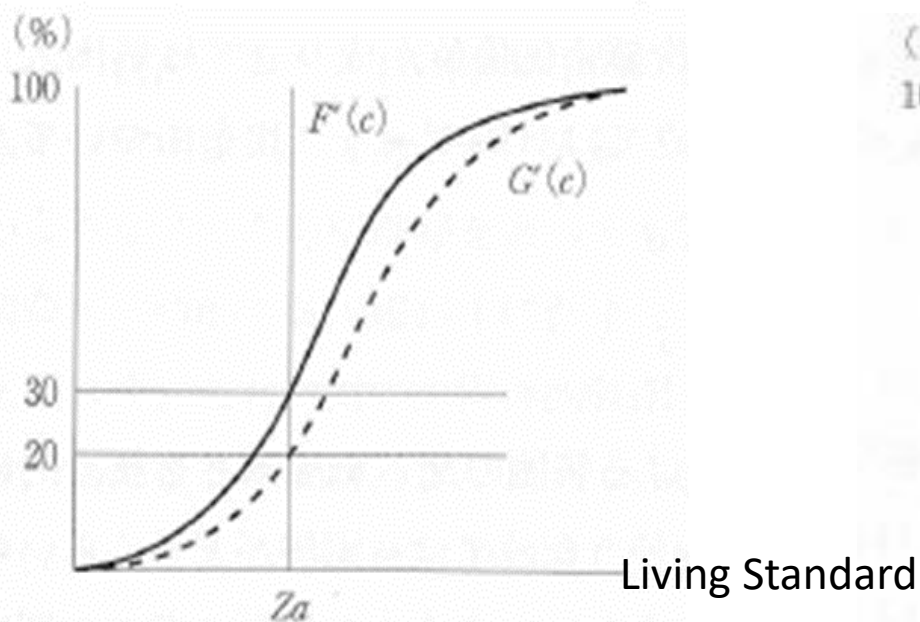
- *FGT* index changes greatly according to the poverty line standards
- Time change regardless the Poverty line: Stochastic dominance
- Cumulative distribution function on the Living standard (Living standards and the share of the persons below the standards)
- Prior period ($F'(c)$)、This time period ($G'(c)$)
Poverty Line $Z\alpha$
- The 1st probability edge: $F'(c) \succ G'(c)$ (Overall improvement)

Stochastic dominance

Poverty Line Z_a : 30%
 $\rightarrow 20\%$, $F'(c) > G'(c)$ in
 all Z_a

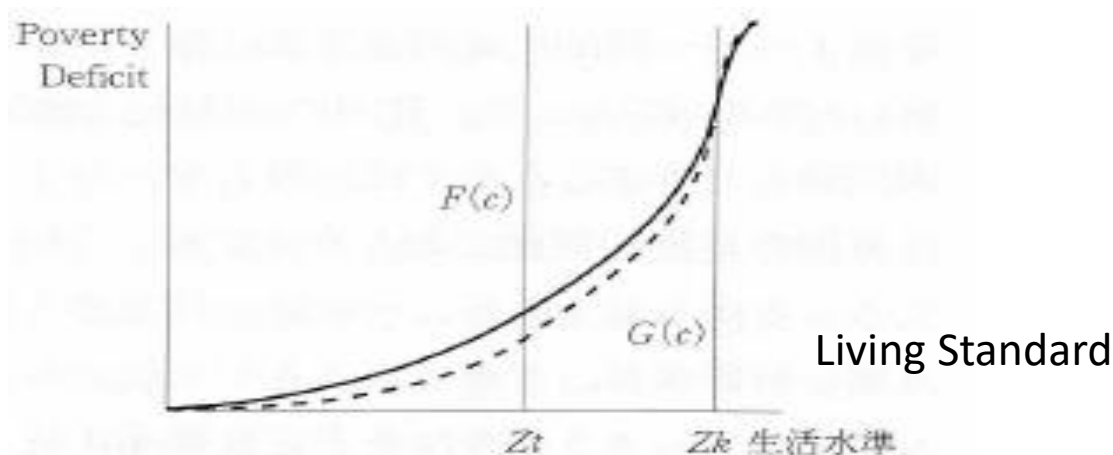
\Rightarrow The first stochastic
 dominance exists

- Different pattern
 below the Poverty
 Line Z_t : Depending
 on the Z_t , No overall
 improvement



Stochastic dominance (2)

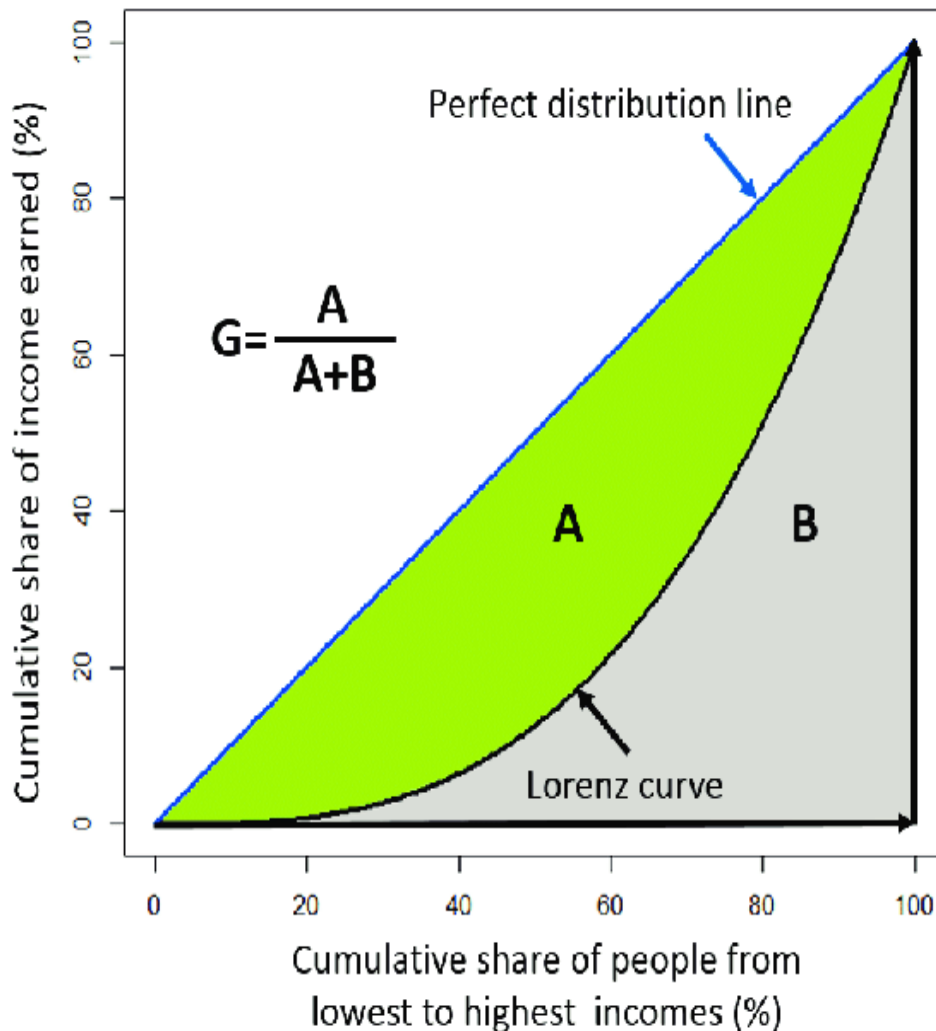
- The 2nd dominance :Checking the shape of Poverty Deficit Curve \Rightarrow Comparing the size of below $F(c)$ and $G(c)$ by Checking the poverty gap in the two patterns



- The 2nd stochastic dominance exists: If $F'(c) > G'(c)$ continues after Z_t to Z_k , then the poverty gap of $G'(c)$ continued to improve

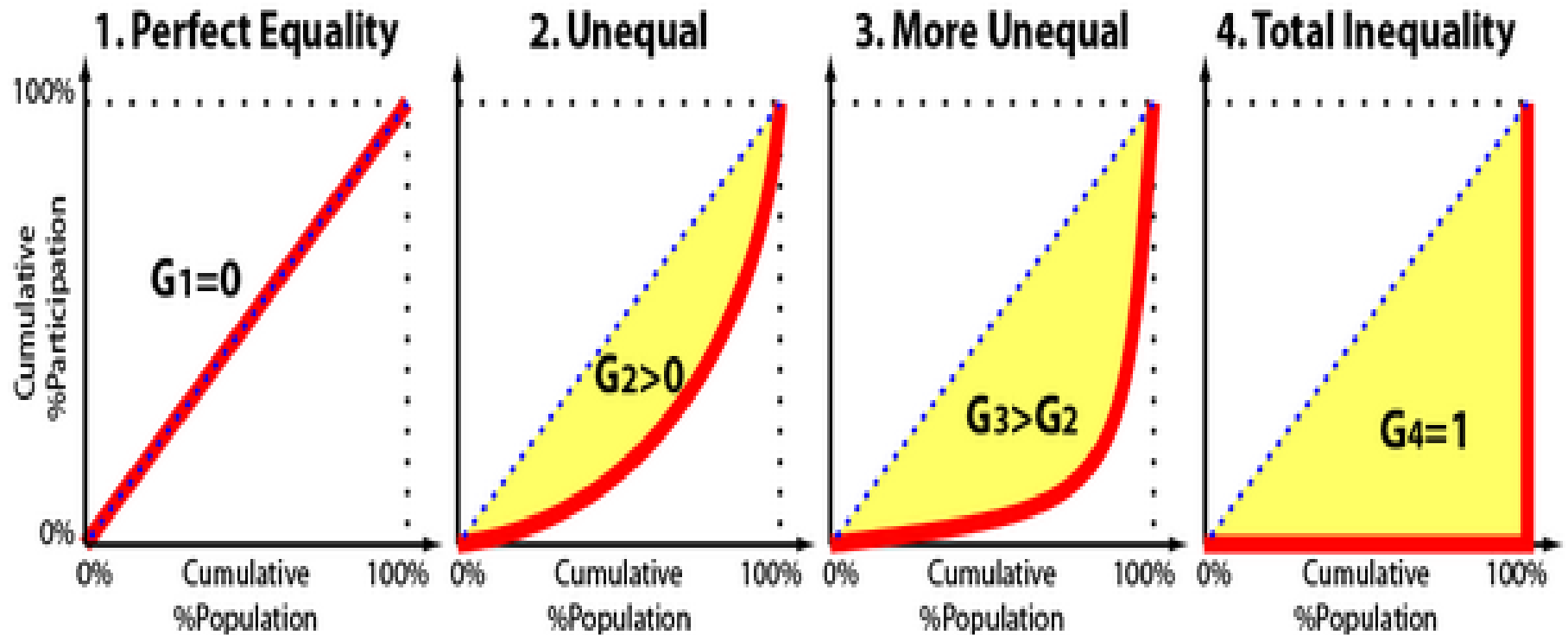
Measuring Inequality: Lorenz Curve and GINI Coefficient

(Source: https://www.researchgate.net/figure/Lorenz-curve-and-Gini-coefficient-G_fig1_319861192)



- Lining up the poorest to the richest in horizontal axis and plot their expenditure in the vertical axis (both cumulative)
- If 10% of population get 10% of whole expenditure, then 45 degree line (perfectly equal)
- If less equal, the line slacks down
- If perfectly unequal, the vertical line on the right
- If perfectly equal 45 degree line
- Gini coefficient (G): $A/A+B$
- $0 < (G) < 1$

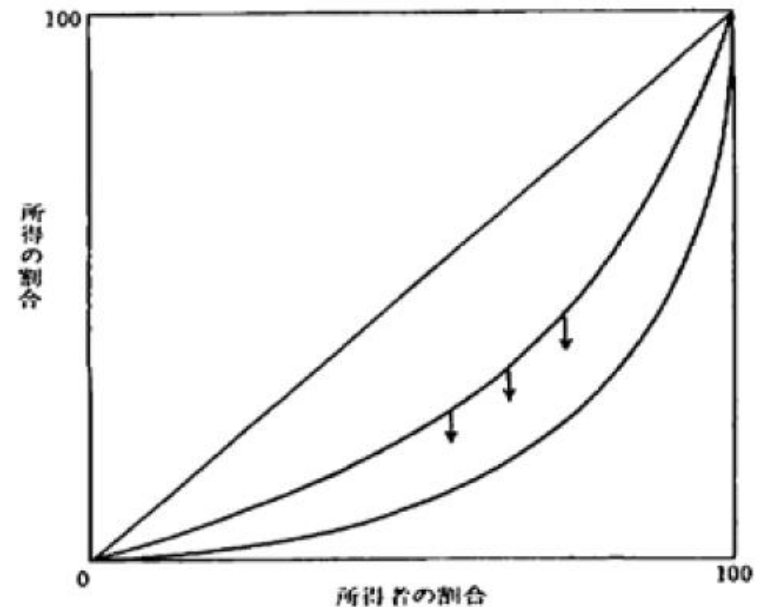
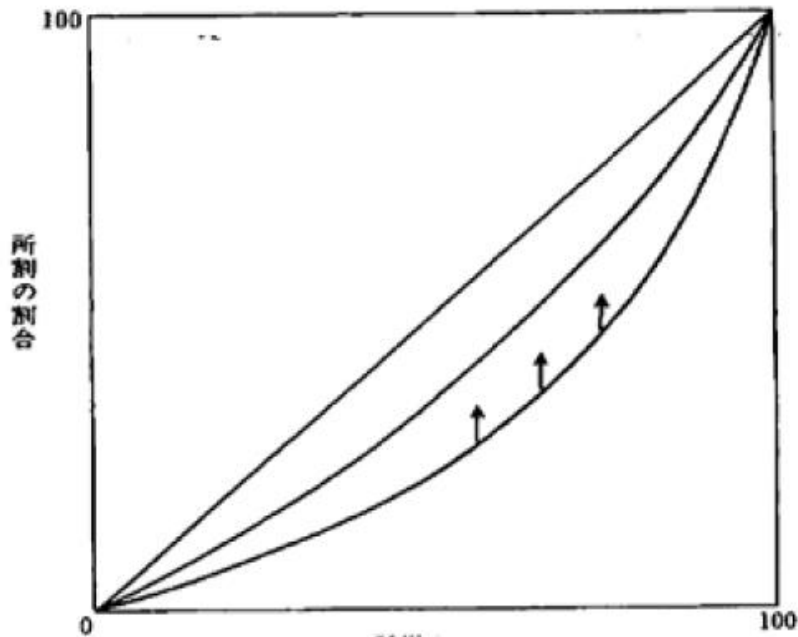
Change of Lorenz Curve



Growth, Poverty, and Inequality

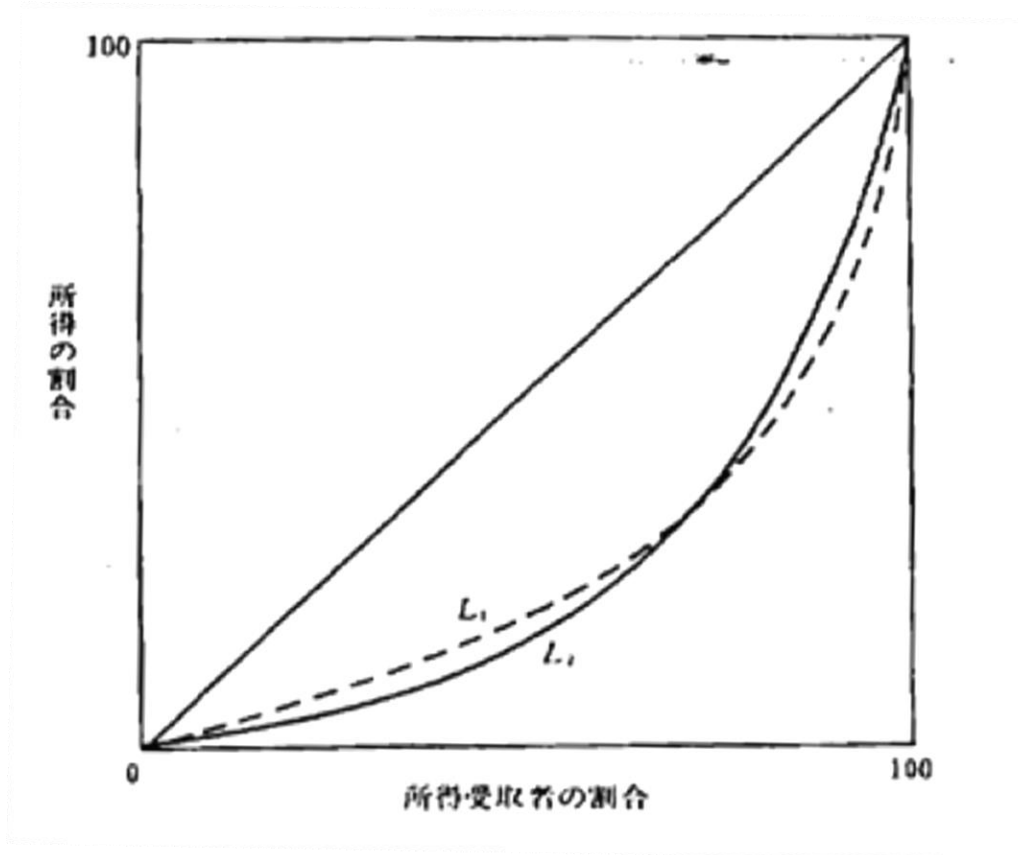
Lorenz Curve goes up with the growth : Then inequality may be improved → Poverty ratio should go down

The opposite case, Poverty ration goes up



Growth, Poverty, and Inequality(3)

- Uncertain case: Growth improved absolute poverty but.....

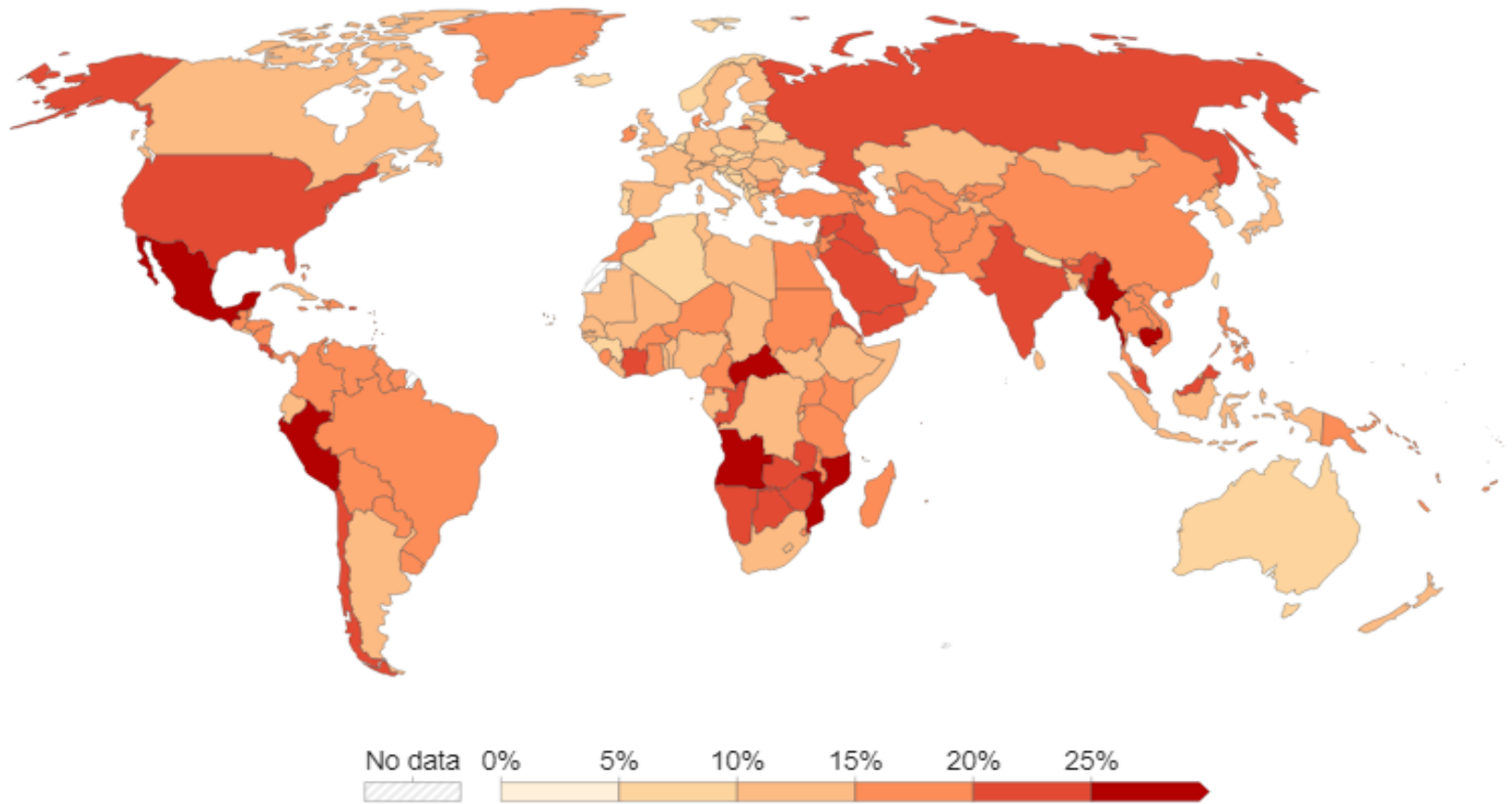


World's inequality

Income share of the richest 1% (before tax), 2022

Our World
in Data

The share of income received by the richest 1% of the population. Income here is measured before taxes and benefits.



Data source: World Inequality Database (WID.world) (2024)

OurWorldInData.org/economic-inequality | CC BY

Note: Income is measured before payment of taxes and non-pension benefits, but after the payment of public and private pensions.

Trends in Global Inequality

- Total inequality (Within country + Between country): Tended to decline
- Between country level: Smaller inequality within the region, but intra-regional gap has started to grow since 2008
- Within < Between country inequality but Between from 1981 to 1993 contributed to global inequality (The world was getting “flat”?) , while Within deteriorated slowly
- Intra country inequality: Latin America > Sub-Saharan Africa > Asia, but the speed of worsening is the fastest in Asia (China)

Global Inequality (Monitoring Inequality)

The Mean Log Deviation is simply the difference between the log of the group's mean consumption and the mean of the logs of all the consumptions within that group

Total inequality (between+within)										
Region	1981	1984	1987	1990	1993	1996	1999	2002	2005	2008
East Asia and Pacific	0.283	0.234	0.229	0.272	0.313	0.296	0.322	0.349	0.328	0.366
Eastern Europe and Central Asia	0.283	0.274	0.283	0.409	0.340	0.358	0.305	0.281	0.279	0.291
Latin America and the Caribbean	0.636	0.652	0.655	0.657	0.695	0.715	0.713	0.725	0.648	0.609
Middle East and North Africa	0.358	0.379	0.311	0.290	0.292	0.298	0.311	0.333	0.261	0.266
South Asia	0.164	0.173	0.175	0.165	0.166	0.186	0.194	0.191	0.193	0.195
Sub-Saharan Africa	0.503	0.533	0.552	0.552	0.521	0.471	0.475	0.509	0.502	0.531
Total	0.651	0.591	0.569	0.576	0.585	0.540	0.518	0.528	0.520	0.567
Between-country inequality										
East Asia and Pacific	0.158	0.100	0.079	0.093	0.113	0.092	0.104	0.108	0.089	0.110
Eastern Europe and Central Asia	0.155	0.144	0.152	0.151	0.067	0.095	0.089	0.077	0.062	0.066
Latin America and the Caribbean	0.096	0.101	0.090	0.058	0.037	0.051	0.043	0.042	0.045	0.048
Middle East and North Africa	0.101	0.122	0.063	0.054	0.060	0.071	0.081	0.104	0.042	0.052
South Asia	0.008	0.008	0.007	0.010	0.009	0.008	0.012	0.009	0.011	0.014
Sub-Saharan Africa	0.165	0.186	0.176	0.177	0.166	0.140	0.149	0.164	0.141	0.184
Total	0.446	0.378	0.344	0.329	0.325	0.276	0.252	0.250	0.249	0.296
Within-country inequality										
East Asia and Pacific	0.125	0.133	0.150	0.179	0.201	0.204	0.218	0.241	0.238	0.256
China	0.093	0.104	0.127	0.147	0.173	0.171	0.193	0.222	0.212	0.237
Eastern Europe and Central Asia	0.128	0.130	0.131	0.258	0.272	0.263	0.216	0.204	0.217	0.225
Latin America and the Caribbean	0.541	0.551	0.565	0.600	0.658	0.664	0.670	0.683	0.603	0.561
Middle East and North Africa	0.256	0.257	0.249	0.236	0.232	0.227	0.229	0.230	0.219	0.215
South Asia	0.156	0.165	0.168	0.155	0.157	0.178	0.182	0.182	0.182	0.181
Sub-Saharan Africa	0.338	0.347	0.376	0.375	0.355	0.331	0.326	0.345	0.361	0.347
Total	0.205	0.213	0.226	0.247	0.260	0.264	0.266	0.277	0.271	0.271
Total excluding China	0.249	0.256	0.263	0.285	0.292	0.297	0.292	0.296	0.291	0.282

Inequality in major developing countries (2008-11) (Janvry and Sadoulet P.251)

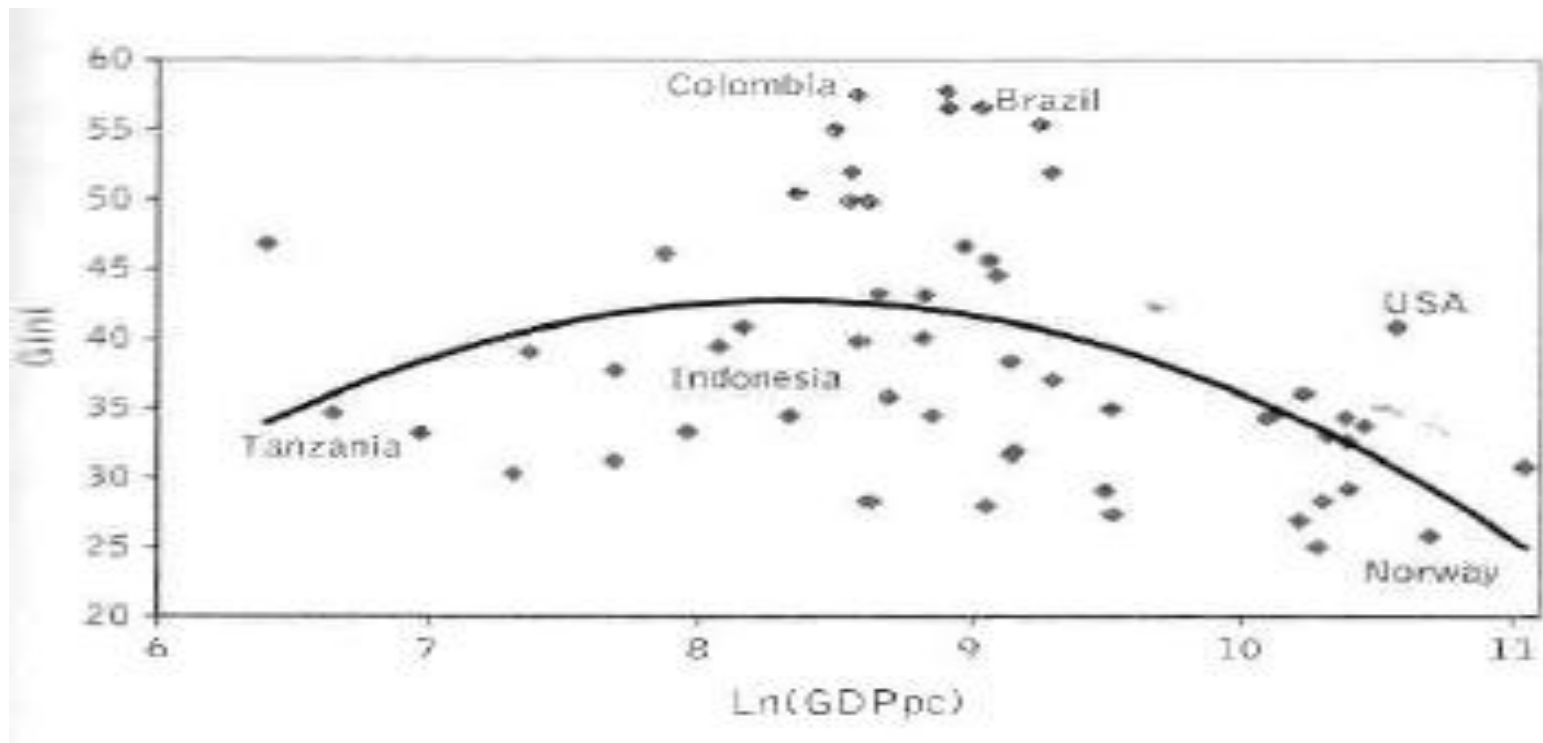
- Kuznets ratio: Top 20%/Bottom 20%

<i>Country</i>	<i>PPP-GDPpc</i>	<i>Gini</i>	<i>Income share</i>		<i>Kuznets ratio</i>
			<i>lowest 20%</i>	<i>highest 20%</i>	<i>20/20</i>
South Africa	11426	63	2.7	68.2	25.3
Honduras	4188	59	1.8	61.9	34.4
Brazil	13773	55	0.8	58.8	73.5
Rwanda	1242	51	5.2	56.8	10.9
Nigeria	5048	49	4.4	54.0	12.3
Peru	9724	49	3.8	53.1	14.0
Mexico	14726	47	4.8	53.2	11.1
China	9053	42	4.7	47.5	10.1
Senegal	2140	40	6.1	46.9	7.7
Thailand	12575	40	6.7	47.2	7.0
Indonesia	7872	37	7.7	44.1	5.7
Vietnam	4400	36	7.4	43.4	5.9
Ethiopia	1041	34	8.0	41.9	5.2
India	4549	34	3.7	42.8	11.6
Bangladesh	2093	32	8.9	41.4	4.7
Pakistan	4139	30	9.6	40.0	4.2

Source: World Bank, *World Development Indicators*.

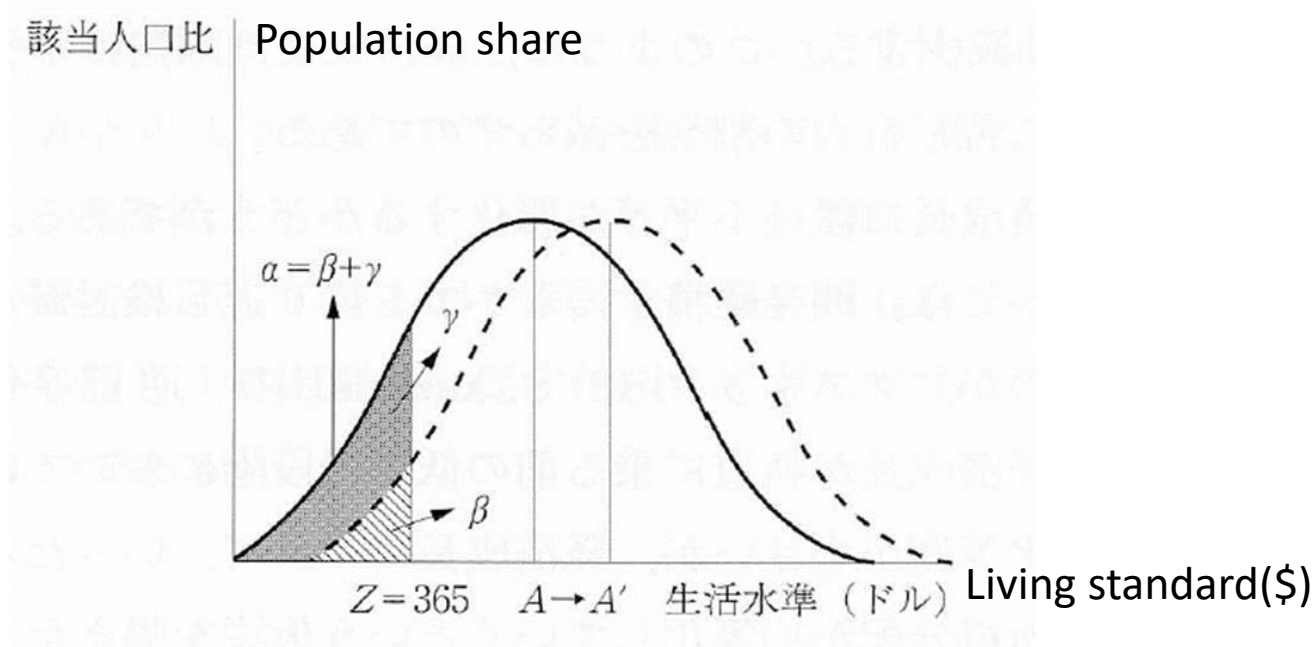
Growth and Inequality

- The Kuznets inverted-U shape hypothesis: Low income stage tends to be relatively equal, but inequality increases in growth and then, fall again \Rightarrow Not empirically robust?



Growth and Poverty: Trickle down

- Vertical axis: Population share, Horizontal axis: Living standard
- If normal distribution continues, then poverty ratio goes down ($\alpha < \beta$)



Growth and Inequality (2): “Trickle down” effect?

- Higher growth, Speedier poverty reduction? → Possible but not evidenced
- Inequality bothers growth? \Rightarrow Possible but not investigated fully
- Ravallion, Chen (1997): Poverty reduced in growing countries but not in stagnated countries
- Ostry (2014): Growth-Poverty relations are not clearly related
- Trickling down cases: Post War Japan, East Asian in 1980s, China since 1979~early 1990s, Latin America in 2000s, but the trickling down mechanism??Policy?

Growth and Inequality (3)

- (A) : Working on inequality may encourage growth
 - ← Financial access for the poor, Innovation, Education
 - ← Security, Corruption, Social capital stock.....
- (B) : Inequality may work on growth
 - ← Political incentives for re-distribution policies (median voter theorem)
 - ← Progressive taxation may hinder working motivation
 - ← Increasing saving ratio may work through investment cost reduction or increase return for investment

Growth and Inequality (4)

- Working on distorted redistribution of factors (Labor, Land, Capital) for functional policies
 - ⇒ Ex. Minimum wage increase (Relative price for labor \uparrow), Capital goods bias (Exchange rate, Tax incentives, Interest subsidies...
- Redistribution of assets
 - ⇒ Ex. Land reform, Progressive tax
Human capital (Education opportunities)
- Direct transfer
 - ⇒ Ex. Subsidies, Social safety net, Basic income?

Growth and Inequality (5): Developing countries

- Investment opportunities problems:
Basic credit access, Education access
- Low productivity for health by nutrition problems
- Wealthy class behavior (Saving and Consumption does not link Production, while only increasing import)
- Temporary poverty to chronicle poverty by lacking social safety net

Suggested Readings

- Todaro, Smith (2014) *Economic Development* (12th edition), The Peason
- Ravallion, M and S. Chen (1997) “What can new Survey Data tell us about recent changes in distribution and poverty”, *World Bank Economic Review*, Vol.11, No.2
- ----- (2012) Monitoring Inequality (<https://blogs.worldbank.org/developmenttalk/monitoring-inequality>)
- Dollar and Krray (2002) “Growth is Good for the Poor”, *Journal of Economic Growth*, Vol.7, No.3
- Jeffrey G. Williamson (1991) *Inequality, Poverty, and History*, Blackwell Pub
- Thomas Pikkety (2014) *Capital in the Twenty-First Century*, Harvard University Press