

Aggregate Indicators of Economic Development

"Not everything that counts is countable and not everything that is countable counts." Albert Einstein

Fall 2010

Meaning and Measurement

- What do we mean by economic development?
- Why do we need indicators?
- Does it matter how we measure it?

Real Per Capita GNP (=GNI)

- What is real per capita GNP ?
- GNP versus GDP ?
- How do we compute growth rates?
- How can we decompose growth rates?
- How should we make comparisons across countries?

PPP Example 1

- Two countries and two goods

Country	Computers Produced per Capita	Ice Cream Produced per Capita	Price of Computers Local Units	Price of Ice Cream Local Units
Canada	12	4	2	4
Mexico	3	1	1	1

PPP Example 2

- What if consumption baskets are not proportional?

Country	DVDs Produced per Capita	Hair Cuts Produced per Capita	Price of DVDs in Local Currency	Price of Hair Cuts in Local Currency
USA	9	4	2	4
China	3	4	10	10

1997 Asian Financial Crisis

Country	Exchange-Rate Conversion ^a		Purchasing Power Parity Conversion	
	1995	1998	1995	1998
China	745	1,063	3,480	4,730
Hong Kong ^b	142	188	141	190
Indonesia	190	51	733	1,020
Malaysia	78	71	181	240
Philippines	72	68	192	240
South Korea	435	272	515	660
Singapore	80	92	68	90
Thailand	160	97	439	530
Total	1,902	1,903	5,749	7,700

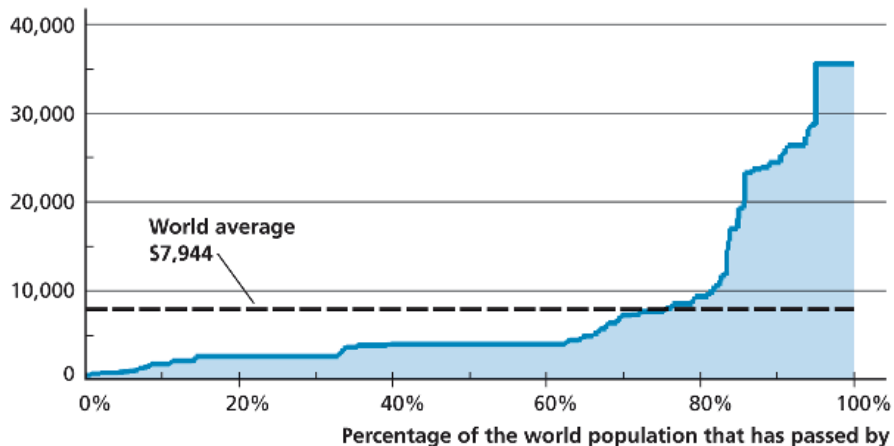
Sources: *Economist*, February 7, 1998, p. 72; World Bank, *World Bank Atlas, 1997* (Washington, D.C.: World Bank, 1997): pp. 16, 17, 36, and 37.

^aUsing February 4, 1998, exchange rates for 1998 calculations.

^bIn 1995 Hong Kong was still a country under British colonial rule; in 1998 it was part of China, having been reincorporated on July 1, 1997.

Figure: GNP in US\$Billions before and after the Asian Financial Crisis

GDP per capita



Source: Heston, Summers, and Aten (2002).

Figure: Parade of World Income (Weil, 2009)

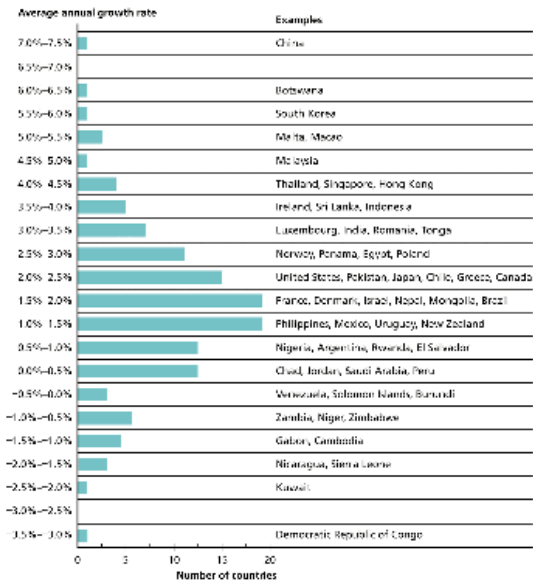


Figure: Distribution of Growth Rates, 1970-2005 (Weil 2009)

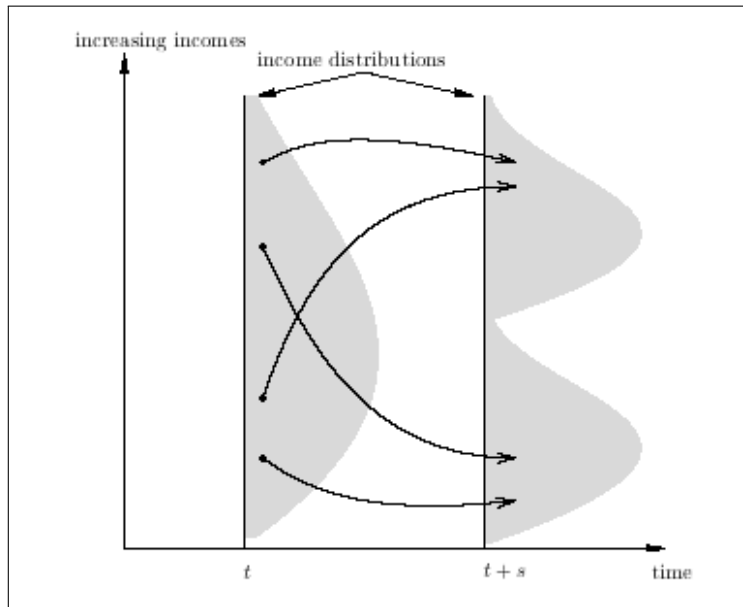


Figure: Twin-peaks distribution dynamics

Dangers of looking only at per capita GNP

	Paraguay	South Africa
Per capita GNP	4,642	11,110
Education enrollment	69.1%	77.0%
No Access to Safe Water	14%	12%
Share below \$2 per day	29.8%	34.1%
Life Expectancy	71.3	50.8
Fraction of not reaching 40	9.7%	31.7%
Adult literacy	93.5%	82.4%
% under 5 who are underweight	5%	12%

The Human Development Index

- An attempt to take account of other factors:

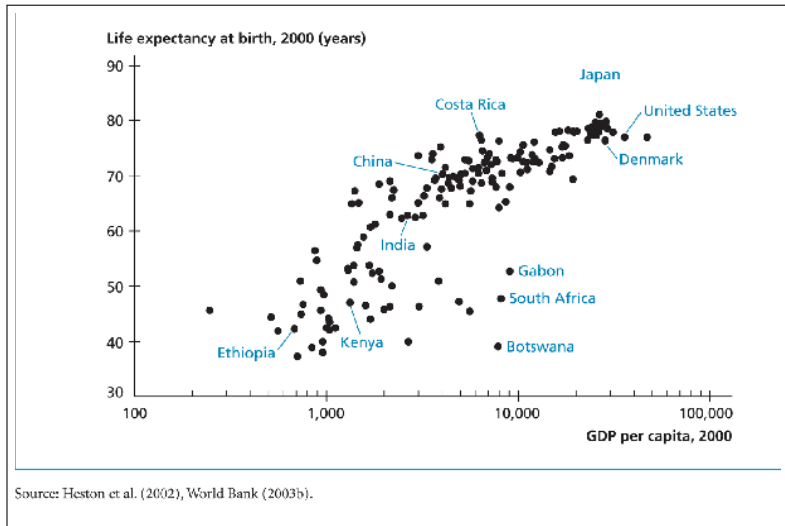
$$HDI = \frac{1}{3}(\text{longevity}) + \frac{1}{3}(\text{knowledge}) + \frac{1}{3}(\text{standard of living})$$

where for country A

$$\text{longevity} = \frac{\text{life expectancy in A} - 25}{\text{max. life expectancy} - 25}$$

$$\text{knowledge} = \frac{2}{3}(\text{adult literacy index}) + \frac{1}{3}(\text{enrollment rate})$$

$$\text{standard of living} = \frac{\log(\text{per capita GNP of A}) - \log(100)}{\log(\text{max per capita GNP}) - \log(100)}$$



Source: Heston et al. (2002), World Bank (2003b).

Figure: Life Expectancy vs. GDP per capita (Weil 2009)

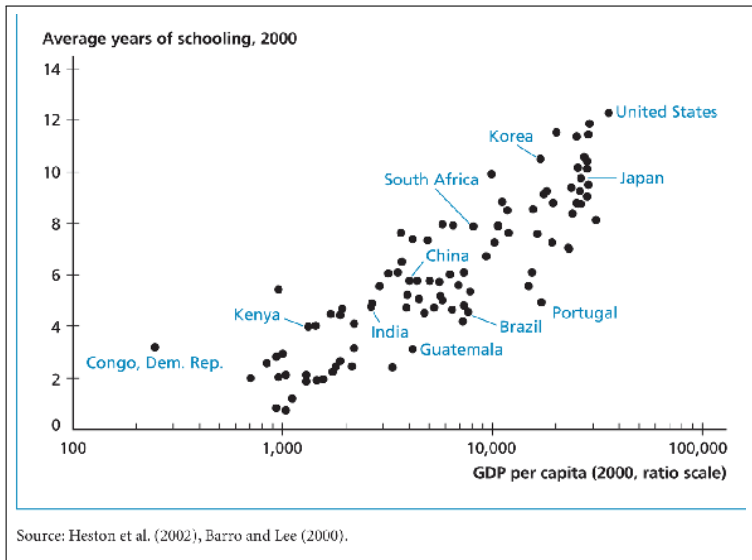


Figure: Average years of schooling vs. GDP per capita (Weil 2009)

Measures of Inequality

- The Kuznets ratio
- The Lorenz curve
- The Gini coefficient

Table 4 – The Distribution of Income in a Hypothetical Economy

Individuals	Personal income (money units)		Percentage share in total income		Lorenz Curve Coordinates	
			Quintiles	Deciles	Cumulative % Population	Cumulative % of income
1	0.8			5	0.8	
2	1.0		1.8	10	1.8	
3	1.4			15	3.2	
4	1.8	5	3.2	20	5.0	
5	1.9			25	6.9	
6	2.0		3.9	30	8.9	
7	2.4			35	11.3	
8	2.7	9	5.1	40	14.0	
9	2.8			45	16.8	
10	3.0		5.8	50	19.8	
11	3.4			55	23.2	
12	3.8	13	7.2	60	27.0	
13	4.2			65	31.2	
14	4.8		9.0	70	36.0	
15	5.9			75	41.9	
16	7.1	22	13.0	80	49.0	
17	10.5			85	59.5	
18	12.0		22.5	90	71.5	
19	13.5			95	85.0	
20	15.0	51	28.5	100	100	
Total:	100.0	100	100			

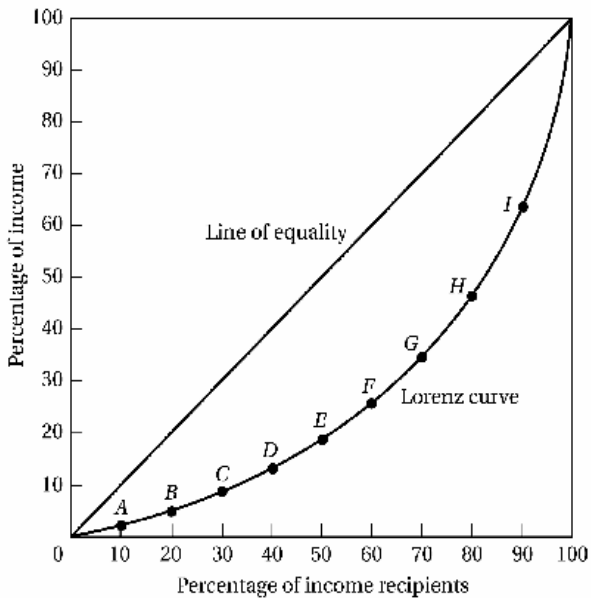


Figure: The Lorenz Curve

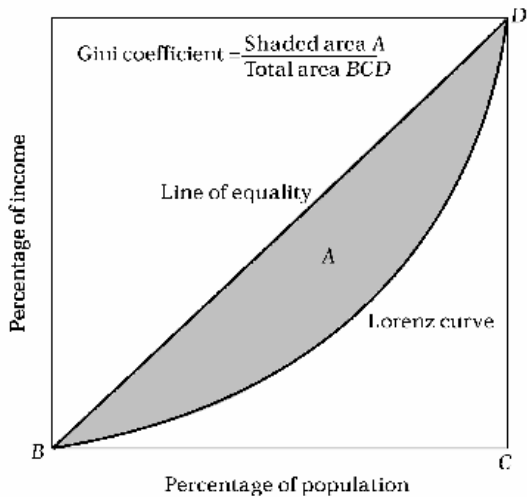


Figure: The Gini Coefficient

The Kuznets Curve

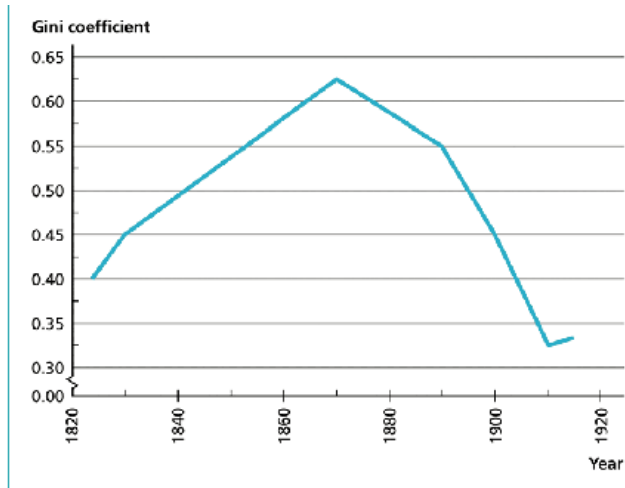


Figure: Inequality in the UK: 1820-1915

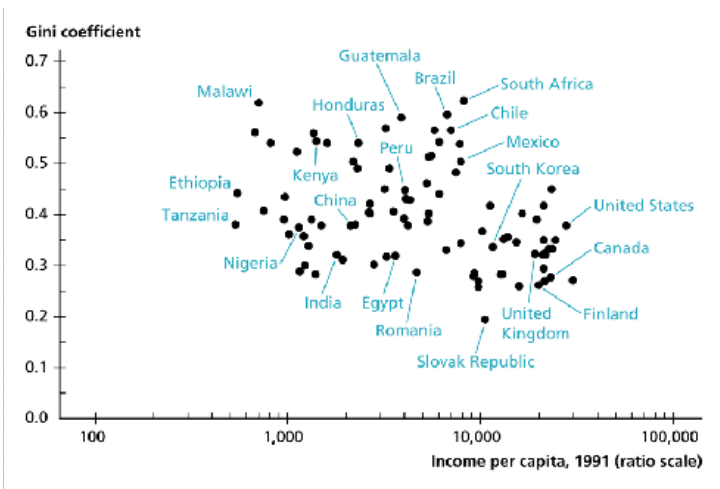


Figure: Inequality vs. per capita income across countries

Measures of Poverty

- The Headcount index
- The Poverty Gap
- The Human Poverty Index

Poverty vs. Growth

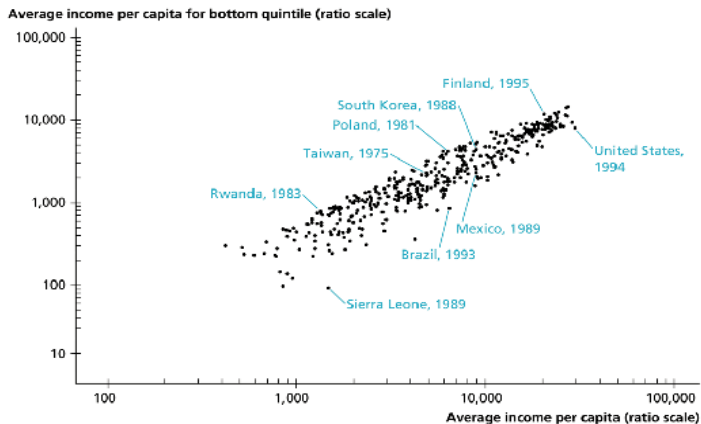


Figure: Relationship between poverty and growth (Weil, 2009)

Ten Common Characteristics of Developing Nations

- 1 Low levels of human capital – education and health
- 2 Adverse geography
- 3 Poor institutions
- 4 High dependence on agriculture
- 5 Underdeveloped land markets
- 6 Underdeveloped financial markets
- 7 High rates of unemployment
- 8 Large rural populations, but rapid rural-urban migration
- 9 High rates of fertility
- 10 Low levels of industrialization and manufactured exports