



Monetary Metrics: GDP per capita at PPP



$$GDP = C + I + G + (X - M)$$

C= Consumption
I= Investments
G= Government spending
X= Exports
M= Imports

J.M. Keynes, 1940

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Hello, welcome to the second part of the chapter entitled What is poverty? In the first video, we have seen that poverty is a multi-dimensional problem. We have also seen the definition of poverty by the world-bank, which we have used as a base to try and understand how we can measure poverty. To do this, we have defined three types of metrics: those based on monetary values, those based on non-monetary metrics and those which are composite, combining the two. We have started looking at monetary metrics and have seen the concept of the poverty line, defined as 1.9 international dollar, per capita, per day, at Purchasing Power Parity or PPP. There is another monetary metric which we need to mention because it is very widely used: the Gross Domestic Product per capita. The idea is to measure the market value of the total production or output within a country in a given year. Without going into details, GDP is defined roughly as the sum of private household consumption (C), such as durable and non-durable goods and services,. Plus Investments (I) made by public or private sectors on capital equipment, inventories and structures, Plus Government spending (G), such as compensation of government employees, public health spending, etc.

Notes

Summary



0m 26s



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Plus the net exports of the country, which is the value of all exports (X) minus the value of imported goods (M). In other words, it represents the value of domestic goods purchased by foreigners, minus the value of foreign goods purchased by nationals. Finally, of course, this figure is in units of national currency and must be converted into international dollars at PPP as we have seen. Furthermore, it is divided by the amount of people living in the country to end-up with GDP, per capita, at PPP. This concept is based on the work of John Maynard Keynes in the 1940's. At that time, there was a need to measure Great Britain's ability to wage war, which in economic words meant: its ability to produce tanks and airplanes. It is really intended to be a measure of production or output, and not welfare. However, it is still widely used and abused as a metric for welfare. To illustrate this discrepancy, take for example Equatorial Guinea: it has a GDP which is rather high at \$33'000/capita per year, which would make it a high-income country. And yet close 80% of the population lives below the poverty line. How is that possible? In fact, Equatorial Guinea has oil, which it exports, and this increases the X in our equation.

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1m 52s



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However, the share of that GDP available for household consumption is only 17% of the whole, which is the C in our equation. This tells us that a majority of all households do not benefit from the oil-revenues which are kept by a minority. We will come back to this question of income distribution.

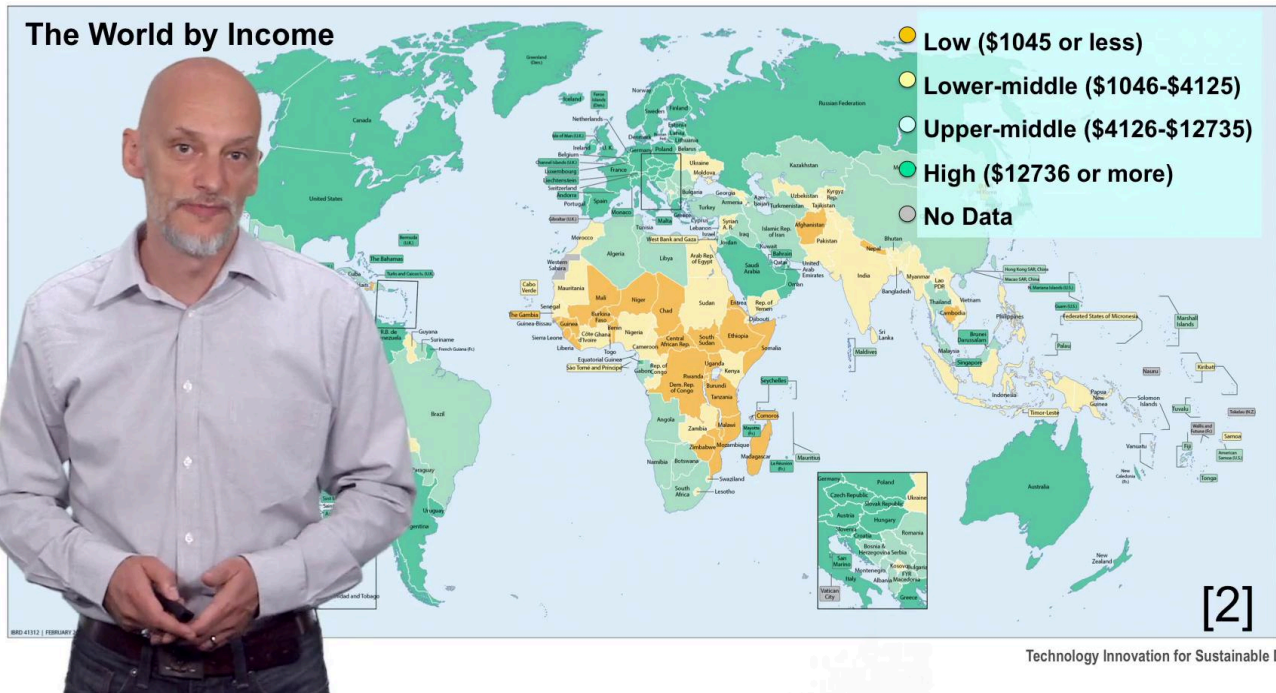
Notes

Summary



3m 15s

Map, country Classification



Based on the calculation of GDP per capita, or more precisely on Gross National Income which is a variant of GDP, the world bank has defined a classification of countries. It defines Low-income as those countries that have an income of 1'045 dollars per capita, per year, or less. Middle-Income countries are split into lower-middle and Upper-middle income, and finally we have high income countries. Those are the ones with a Gross National Income above 12'736 dollars per capita at PPP per year. In our MOOC we will often refer to Low and Middle-Income countries as the region of interest. As you can see on this map, many of the poorest countries are landlocked, such as the string of countries running through the center of the African continent, or Nepal for example. Other countries, such as Afghanistan or Somalia remain poor, because they are afflicted by war. You might ask yourself if it is enough to know how countries compare. Remember the case of Equatorial Guinea: wouldn't it be interesting to know also how wealth is distributed inside a specific country?

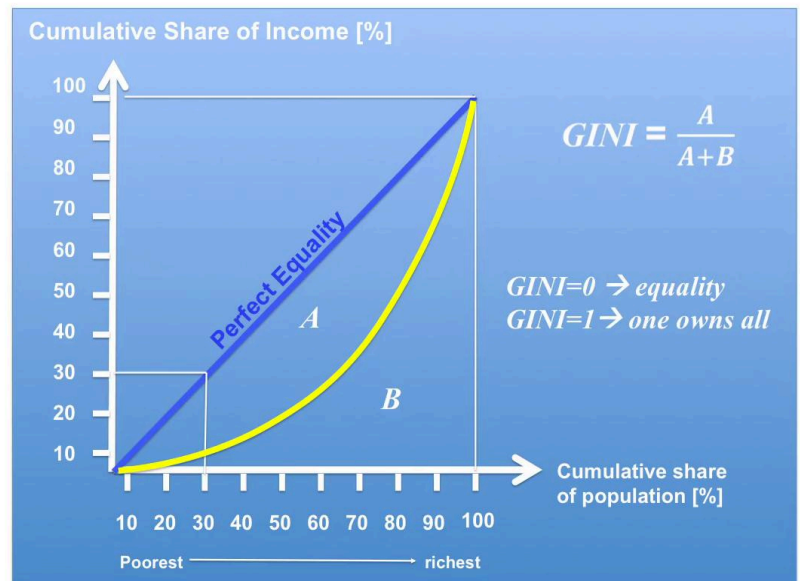
Notes

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3m 36s

How is poverty distributed within a country?



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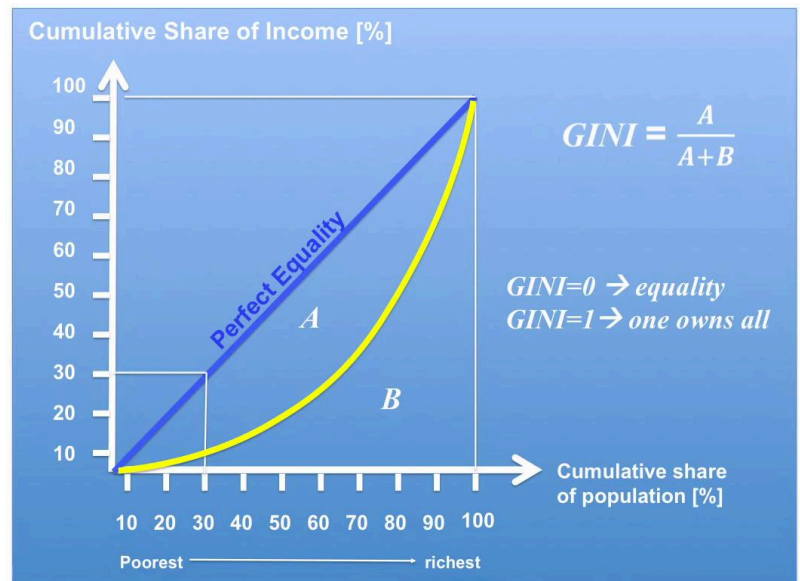
To determine the level of inequality inside of a country, economists use another measure developed in 1912 by the Italian statistician Corrado Gini, thus called the GINI index. He had the idea to use the so called Lorenz curve to calculate inequality index. The Lorenz curve is obtained by drafting cumulative income as a function of cumulative population. In other words, you list the poorest on the left of the horizontal axis and then sum up the population in ascending order by degree of wealth, up to the richest. You then divide everything by the total number of people and you get an axis with the cumulative share of the population ranked from the lowest to the highest income. On the vertical axis you represent the cumulative share of income earned. If we consider a perfectly equal society you would have to have the poorest 30% of the people owning 30% of the income, the poorest 50% having 50% of the income and so forth. The Lorenz curve of such a hypothetical country would be the straight line, in blue. Unfortunately, in the real world, income is not evenly distributed: some parts of the population have much more income than others.

Summary



4m 50s

How is poverty distributed within a country?



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So the Lorenz curve really looks like the yellow one, where you can see that the poorest 30% of the population own only roughly 10% of the income, while the richest 10% get about 30% of the income. The Gini index measures the area between the Lorenz curve and the hypothetical line of absolute equality. This is expressed as a percentage of the maximum area under the line or A over A plus B. Thus a Gini index of 0 represents perfect equality: the yellow curve would be identical with the straight blue line. An index of 1 implies perfect inequality which would mean that one person gets all the income, and all the others get none. This index can now be applied to look at how unequal different countries are.

Notes

Summary



6m 08s



Life expectancy at birth

Country groups (World Bank)	Life Expectancy at Birth (average years)
Low-income	61.3
Lower-Middle	67.2
Upper-Middle	74.7
High Income	79.2

[4]

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Here is a list of some countries' GINI indices. As you can see, it is not because a country is poor that it has a high level of inequality: Tanzania which is a low-income country is less unequal than the United States, which is a High-income country. South Africa on the contrary is an upper-middle income country with has a very high Gini index. This indicates that there are wide differences in income across the population. Together with GDP, the Gini index provide convenient ways to explore and measure progress with regards to poverty and its distribution. However these metrics are based on monetary dimensions. As we have seen, poverty is multi-dimensional. So let us now turn to some non-monetary metrics and indicators for the state of well-being. There are numerous such metrics which measure any of the different dimensions of poverty. We will pick just two, one in the area of health and the other in the area of Education. Life expectancy at birth is a health indicator that is calculated based on a number of assumptions. It represents the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.

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Summary



6m 57s



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[4]

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It incorporates the mortality patterns that prevail across all age groups in a given year – children, adolescents, adults and the elderly. In this table we have listed the average Life Expectancy at birth per income group according to the world-bank classification. Obviously, at first sight, countries with higher incomes have a longer life expectancy: there are more funds available to pay for healthcare, clean drinking water and good quality food. Things are of course a bit more complicated than that. For example if we consider an African country like Cameroon. Its Life expectancy at birth is as low as 55 years. However, this very low value is largely influenced by the shockingly high level of child mortality in this country: Cameroon has an infant mortality rate of 88 children for every 1000 live births as compared to 7 for every 1000 live births in the United States. In other words, a child is over 10 times more likely to die before reaching its 5th birthday in Cameroon, than it would in the United States. This, of course, significantly reduces the overall Life expectancy at birth. As with any single numerical indicator, one has to remain cautious about how the indicator is constructed: what it accounts for and, what it doesn't.

Notes

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8m 17s

Non-Monetary Metrics: Education



Primary completion rate

%	Both sexes	Male	Female
Italy	100	100	100
India	97	94	99
Cameroon	73	77	68
Chad	38	46	30

[5]

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The second non-monetary metric characterizes education. It is called the primary school completion rate. This factor measures the proportion of people entering the last grade of primary education compared to all the people who would have the age to be enrolled. In this table you can see that in Chad, which is one of the poorest countries, not even 40% of the population finishes primary education. The difference between male and female is also very important. It is thus very sad that less than one in 3 girls can achieve only primary education, let alone secondary. This is obviously sad for the people themselves, but sad as well from the perspectives of that country.

Notes

Summary



9m 40s



$$\text{HDI} = (\text{LEI} \times \text{EI} \times \text{II})^{1/3}$$

LEI = Life Expectancy Index

EI = Education Index

II = Income index
(based on log of GNI)

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We will now turn to the last type of metrics, which we called composite, because they involve both monetary and non-monetary parameters. Let us look at one such metric called the Human Development Index. It was first proposed in the 1990s by the United Nations Development Program. The Human Development Index is a geometric mean of the Life Expectancy index, times the Education Index, times the Income Index. The Life Expectancy Index, or LEI, is based on life expectancy at birth, which we have just have seen. The Education Index, or EI, is a combination of mean years of schooling and expected years of schooling, and is yet another non-monetary index. Finally, the Income Index, or II, is based on the logarithmic value of the Gross National Income expressed in PPP dollars per capita. All these indices are normalized in order to have a value between 0 (worst) and 1, which represents an aspirational but realistic goal to be reached in that particular dimension: for example a life expectancy of 85 years in a particular country, which corresponds to the highest level reached worldwide, would give this country a Life Expectancy Index of 1. The Human Development Index is used by the United Nations Development Program to rank countries: Let's look at a few of them.

Notes

Summary



10m 24s



2015	HDI	HDI rank
USA	0.9	8
UK	0.9	14
China	0.72	90
South Africa	0.7	116
India	0.6	130
Cameroon	0.51	153
Haiti	0.48	163

[6]

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The table represents the Human Development Index in the second column, and in the third column, the country's ranking when compared to others. There aren't any big surprises at first glance: high-income countries have a higher Human Development Index and of course tend to rank better than low income countries. Differences do appear however if you compare the ranking of South Africa, based on the Human Development Index, with the ranking based on GDP: If we refer to GDP, South Africa ranks 84th, while it is only 116th if you look at Human Development Index. This, of course reflects the influence of non-monetary metrics such as Life expectancy that is accounted for in the Human Development Index but not in GDP. In effect, the life expectancy at birth in South Africa is only 57 years which explains the difference.

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11m 56s



Conclusions



Innovation & technology development for poverty reduction

We have now been able to scratch the surface of this very complex question of what is poverty. We have learned to characterize it using Monetary, non-monetary and composite metrics. This will give us the necessary background for the remainder of this course on how to reduce poverty through innovation and technology development. Good Bye.

Notes

Summary



12m 53s