

## Chapter 2

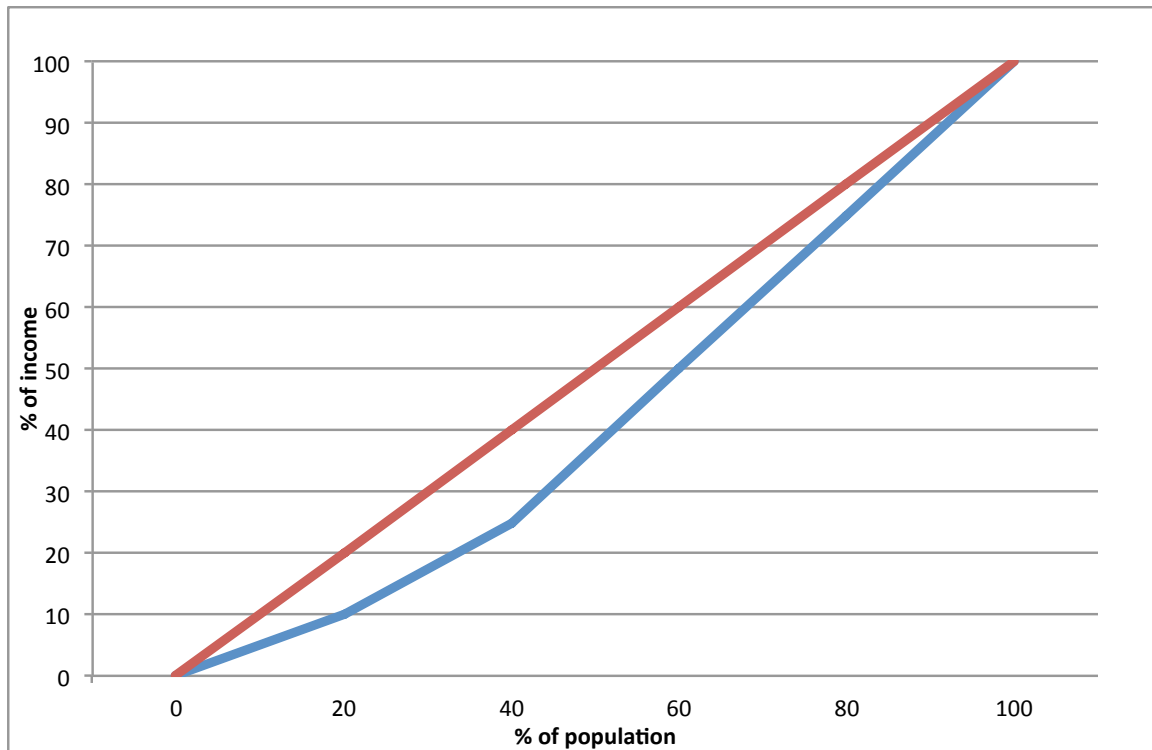
### Poverty and Inequality

1. One calculates the income necessary to purchase 2000 calories of food taking into account people's food habits.
2. The poverty gap counts people below the poverty line in a country but weighs them according to their distance from the poverty line. In practice, one does not have exact data on the income of all those below the poverty line. One therefore computes the poverty gap by multiplying the poverty headcount  $Q$  by the average distance of the poor from the poverty line, in proportion to the poverty line. Calling  $y_q$  the average income of the poor who are below the poverty line and  $z$  the poverty line, the poverty gap PG is thus calculated as follows:  $PG = Q \cdot (z - y_q)/z$

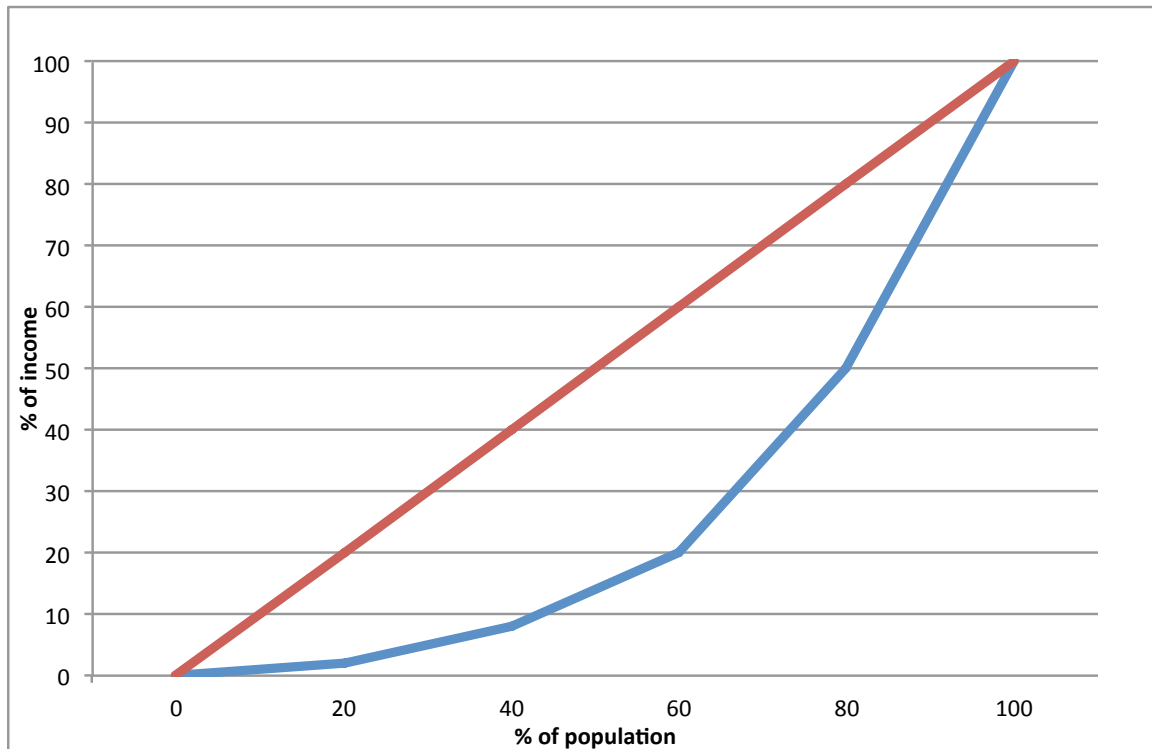
The advantage of this measure over the poverty line is that the latter does not take into account the distance of a poor person's income to the poverty line. Somebody just below the poverty line and somebody just above the poverty line have roughly the same income but the former is counted in the poverty line and not the latter. The poverty gap gives a very small weight to the former but weighs more people who are significantly below the poverty line.

3. Here is how to compute it. Twenty percent have an average income between 0 and 10 cents, i.e. an average of 5 cents. Their weight is thus  $1 - 0.1 = 0.9$ . Fifteen percent has an average income between 10 and 20 cents, i.e. an average of 15 cents. Their weight is thus  $1 - 0.3 = 0.7$ . One follows the same reasoning for the other groups and one obtains:  $0.2 \times 0.9 + 0.15 \times 0.7 + 0.15 \times 0.5 + 0.1 \times 0.3 + 0.2 \times 0.1 = 0.41$ . Remembering that 80% of the population is below the poverty line, the poverty gap tells us that one would have to give to 41% of the population \$1 a day so that nobody would be below the poverty line.
4. A first problem is related to exchange rates. If one takes the poverty line in one country and converts it to that of other countries using market exchange rates, the results are likely to be wrong because exchange rates only reflect the prices of internationally traded goods. A large part of the consumption basket of people below the poverty line is composed of goods that are not traded internationally. To compute internationally comparable data, it is better to use purchasing power parity exchange rates. This solution is better, but not perfect, because purchasing power parity is computed by taking into account an average consumption basket in a country. It would be even better to calculate purchasing power parity exchange rates using the consumption basket of the poor.  
A second problem is that surveys on poverty are done differently in different countries. In some countries, information is collected on people's income, in others on their expenditures. In some countries, people are asked to report expenditures over the past week, in other countries they are asked to report expenditures over the past month. This can lead to different results.
5. The Lorenz curve is constructed by plotting the income of each income quantile, starting by the lowest quantile and ending with the highest income quantile.

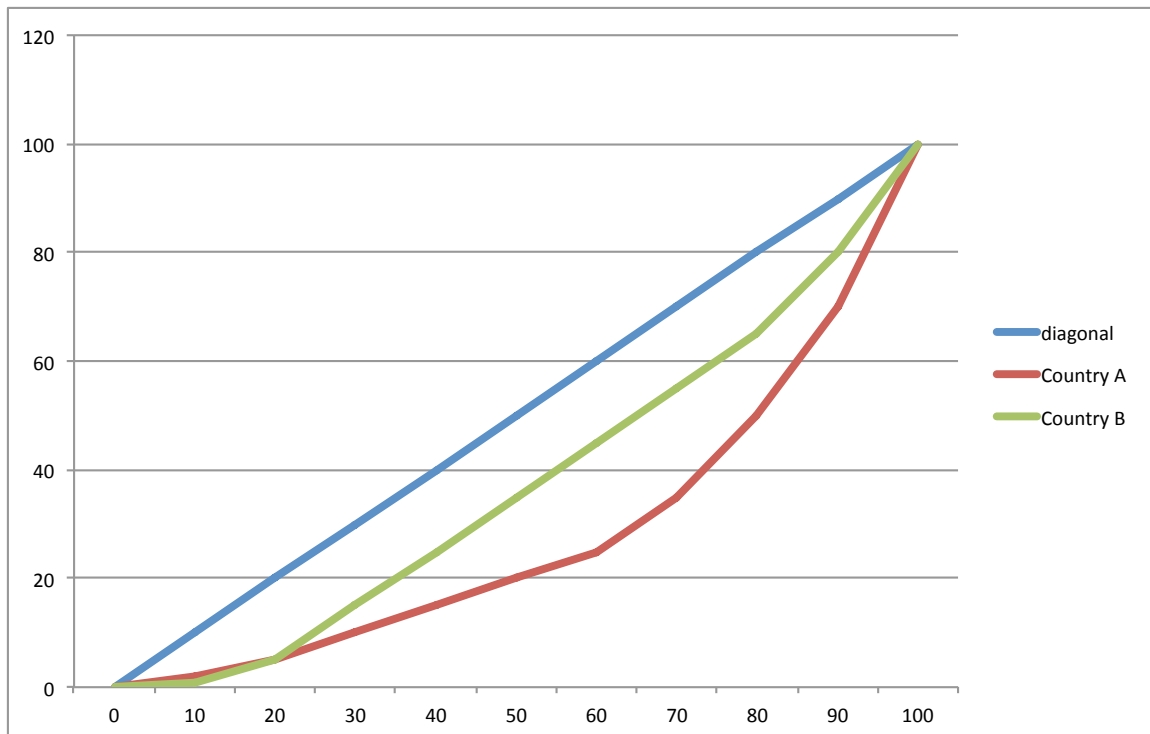
Here is a Lorenz curve representing a relatively egalitarian income distribution based on deciles. Note that the Lorenz curve is not far below the diagonal line representing perfectly egalitarian income distribution.



Here is a Lorenz curve representing a much more inequalitarian income distribution. As one can see, the Lorenz curve is further away from the diagonal line.



6. The Gini coefficient is calculated using data from the Lorenz curve. It is calculated as twice the surface between the diagonal line and the Lorenz curve. If there is low income inequality, that surface will be small, and the Gini coefficient will also be small. If on the other hand, there is high inequality, the surface will be large, and so will be the Gini coefficient.
7. The two Lorenz curves are in the figure below. One can see that overall, country A has a more inequalitarian income distribution than country B even though the poorest decile in country B is poorer than the poorest decile in country A. This is why the Lorenz curve for country A is below that of country B at that point but it crosses the curve for country B at the second decile to stay above.



8. Economic theory has identified the following reasons for why inequality may be bad for growth:

- 1) Credit market imperfections may make it impossible for the poor to borrow and thus to invest in profitable businesses, leading to lower growth for countries having higher inequality and thus more poor people unable to borrow.
- 2) Distortionary costs of redistribution. If inequality is high, there will be more pressures for redistribution. With distortionary taxation, a higher level of redistribution under a more unequal society may lead to lower growth.
- 3) Political instability. High inequality may lead to political instability, which can deter investment, and thus growth.

9. The Milanovic-Ersado paper mentions the following reasons why inequality has increased in transition countries.

First, economic growth has benefited the higher deciles but not the two bottom deciles whose income has grown less than average. Second, inflation has been bad for the poorer 50% but has benefited the richer deciles. Third, economic reforms have increased inequality as they benefited the rich, but less the poorer parts of society. They note that government expenditures did not reduce inequality, which is often the case for other countries. They note however that democracy was very good to reduce inequality.

10. For 2005 and \$45 for the monthly poverty line, we get 29.25% for the poverty headcount and 11.69% for the poverty gap. For 2008 and \$45 per month, we get 26.89% for the poverty headcount and 10.66% for the poverty gap. We thus see a reduction. If we take 2005 and \$60 for the monthly poverty line, we get 39.48% for the poverty headcount and 17.81% for the poverty gap. Taking the difference between 39.48% and 29.25% (equal to

10.23%), we conclude that 10.23% of the world population had in 2005 a monthly income between \$45 and \$60.