Lorenz Curve

Meaning

The Lorenz curve is a way of showing the distribution of income (or wealth) within an economy. It was developed by Max O. Lorenz in 1905 for representing wealth distribution.

The Lorenz curve shows the cumulative share of income from different sections of the population.

Lorenz curve is a type of absolute measure of dispersion. Unlike others, it is a graphical measure of dispersion. Lorenz curve graphically represents the actual curve and a line of equal distribution and exhibits the deviation between these two.

By and large, the deviation of an actual curve from the line of equal distribution is termed as the Lorenz coefficient. Larger is the distance of Lorenz curve from the line of equal distribution, greater is the Lorenz coefficient along with the degree of scattering and inequality within the distribution.

Constructing Lorenz Curve

Initially, we convert the series into a cumulative frequency series i.e. an individual column for cumulative frequency is constructed. Likewise, another column for the cumulative sun of observations is constructed (mid-values of intervals for frequency distribution series).

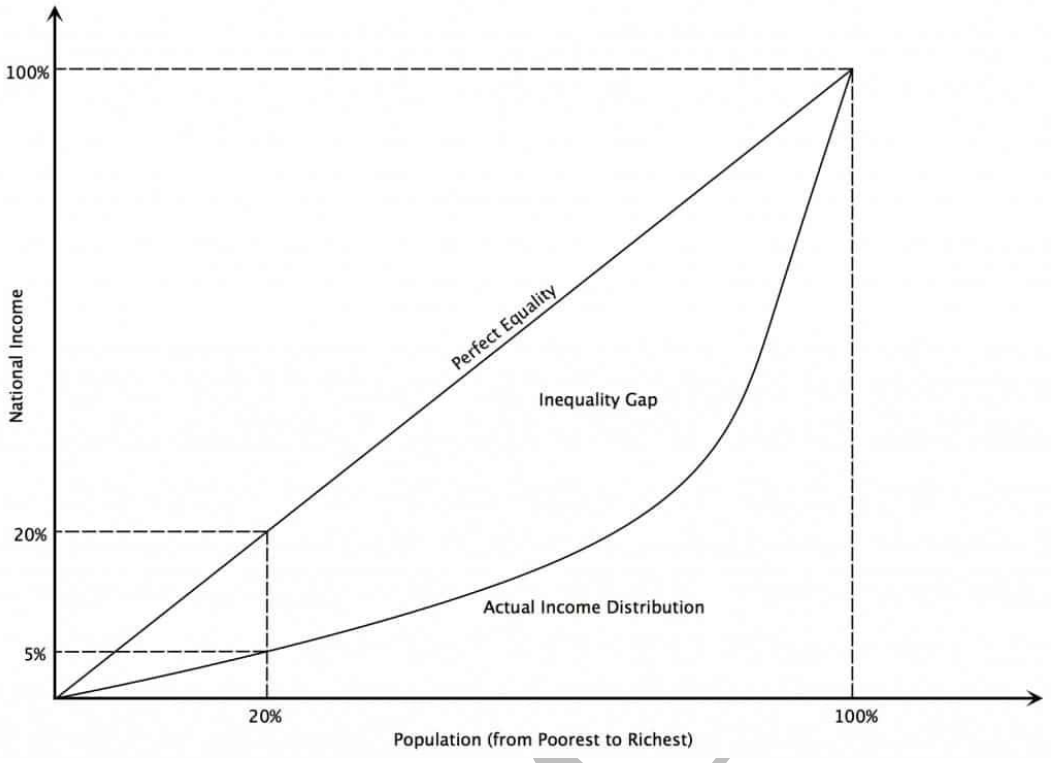
Further, these cumulative sums of frequencies and observations are converted into percentages of the respective sum using the formulae below:

Cumulative percentage for observation= (Cumulative sum corresponding to the observation÷Total sum of observations) ×100

Cumulative percentage for frequency= (Cumulative sum corresponding to the observation÷Total sum of frequency) ×100

Now we plot cumulative frequencies and cumulative items on X-axis and Y-axis respectively. On both axes, values start from 0 to 100. Next, we need to draw the line of equal distribution. This is a straight line with an inclination of 45° to both axes, joining the origin to the point (100,100)

Lastly, we plot the values of cumulative sums, which represent the Lorenz curve. A large gap of the Lorenz curve from the line of the equal distribution represents a large variability in the series.



- The Lorenz curve shows the percentage of total income earned by cumulative percentage of the population.
- In a perfectly equal society, the "**poorest**" 25% of the population would earn 25% of the total income, the "poorest" 50% of the population would earn 50% of the total income and the Lorenz curve would follow the path of the 45° line of equality.
- As inequality increases, the Lorenz curve deviates from the line of equality; the "**poorest**" 25% of the population may earn 10% of the total income; the "**poorest**" 50% of the population may earn 20% of the total income and so on.

The Lorenz curve is often accompanied by a straight diagonal line with a slope of 1, which represents perfect equality in income or wealth distribution; the Lorenz curve lies beneath it, showing the actual distribution. The area between the straight line and the curved line, expressed as a ratio of the area under the straight line, is the Gini coefficient, a measurement of inequality.

While the Lorenz curve is most often used to represent economic inequality, it can also demonstrate unequal distribution in any system. The farther away the curve is from the baseline, represented by the straight diagonal line, the higher the level of inequality. In economics, the Lorenz curve denotes inequality in the distribution of either wealth or income; these are not synonymous since it is possible to have high earnings but zero or negative net worth, or low earnings but a large net worth.