[Academic Script]

Economic Inequality

Subject:	Business Economics
Course:	B. A. (Hons.), 6th Semester, Undergraduate
Paper No. & Title:	Paper – 641 Elective PaperE2 – Economic Growth and Policy
Unit No. & Title:	Unit – 3 Human Capital-Education, Intellectual Capital & Poverty
Lecture No. & Title:	Lecture – 4 Economic Inequality

Academic Script

1. Introduction

We have seen Sen's views on poverty and inequality. The understanding of poverty has changed over time but the concept of inequality has never been disassociated from the concept of poverty.

And, the topics of poverty and inequality can never be disassociated from a course in development economics.

In this section, we check some measures of inequality.

Objectives:

1. To get an idea about inequality in economics.
2. To be able to classify the types of income distribution.
3. To be able to understand the measures of inequality.
4. To be able to understand inequality in real life.
5. To be able to reason out the causes of inequality which we observe in real life.

Meaning of economic inequality

Debraj Ray (1998), describes that at the intrinsic level, "economic inequality is the fundamental disparity that permits one individual certain material choices while denying another individual those very same choices".

In a functional sense, inequality is the measurable disparity in the distribution of national income, assets and goods among different percentile groups of the population to an extent which drags down the rate of economic growth or does not allow the growth rate to rise.

The inequality in distribution of national income or assets can be observed by understanding,

- Distribution of income and assets between different population groups and whether these groups are sticky or

fluid. That is, whether people can move from one income group and income category to another in the short run or in the long run.

For example, if a worker enters the work force at an income level of ₹ 10,000 and remains in the same group for a long time then it is called sticky income group. But if the worker can move from income level of ₹ 10,000 to ₹ 20,000 in the short run then it is called fluid income group.

If the worker can become a profit earner from a wage earner in the short run then we can say that mobility is possible between income categories.

Hence, we must ask whether in a society, the income group and income categories are stick or fluid and to what extent?

The answer to this question will validate whether inequalities can be easily mitigated in a society or not.

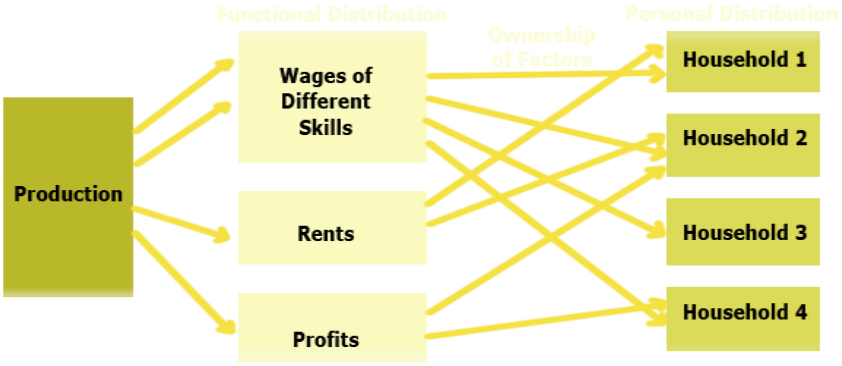
- Another important observation which a society must make is with regards to the functional and personal distributions of income.

  Functional distribution of national income pertains to the proportionate distribution of national income as wages, salaries, interest and profits.

  The personal distribution pertains to the ways in which households receive their total incomes.

  For instance, one household may be earning wages from employment but may also be the owner of a piece of land from which it earns a contractual income by renting it on contract farming.

  Debraj Ray explains this by way of a flow chart



It is important to understand functional distribution of income as an economy must know how its national income is earned. The way in which national income is earned also determines the future growth of the economy.

- Similarly the source from which an individual earns incomes determines how an economy employs its people.

  The way an individual earns her/his income matters to her/his recognition and self-esteem.

  Sometimes people do not find jobs commensurate with their training or they are forced to accept unsuitable or mucky jobs by the society and hence they keep feeling unfulfilled. (Sen, 1975)

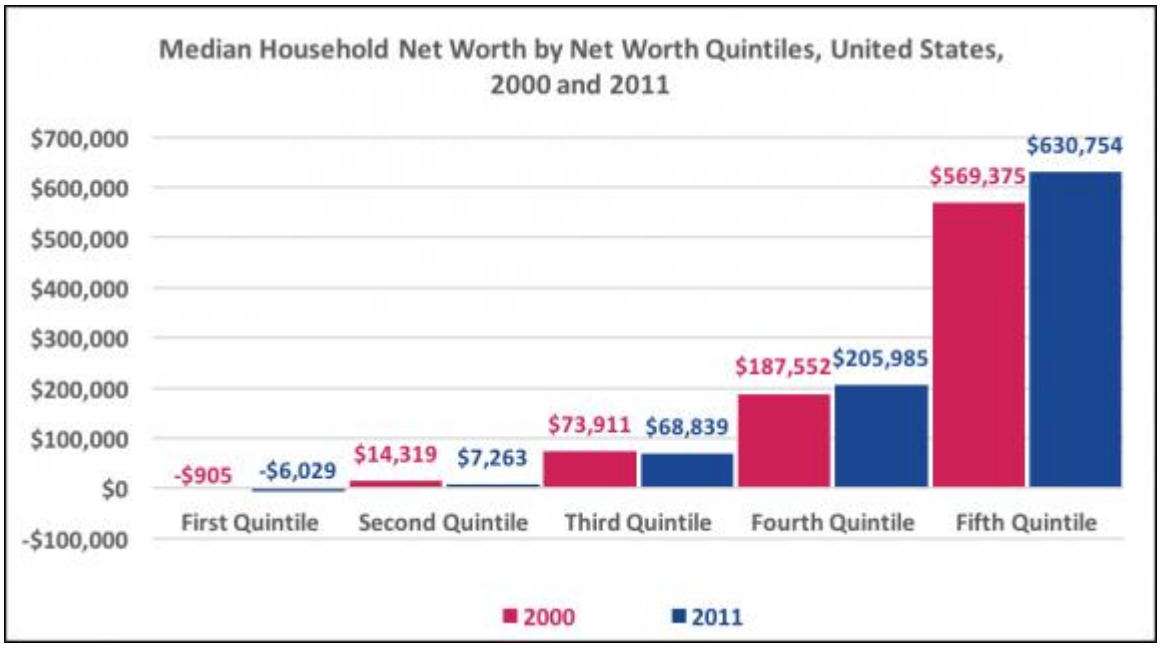
  The source of income helps to understand the issue of inequality as it is difficult for individuals to increase their incomes from some sources; while it may be easy to get richer easily if income is earned from certain types of sources. For instance, a wage earner may find it difficult to increase her wealth even by working very hard as wages do not increase easily and wage-jobs do not easily provide complementary earnings. But if an individual owns a piece of land it is easier to get richer as rents tend to rise easily.

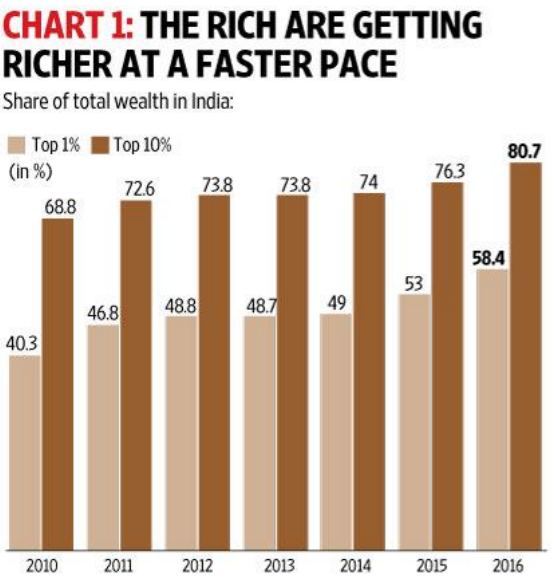
Value of land usually appreciates faster than the value of labour.

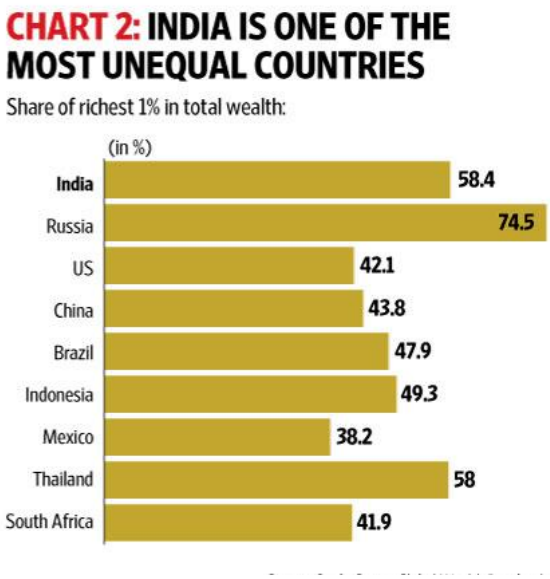
2. Criteria for Measuring Inequality

Prevalence of a high extent and high degree of inequality in any economy is a visible phenomenon.

Look at the charts here. We can easily observe the inequality in wealth distribution in India and the United States.







Some applicable criteria in measuring inequality stated by Ray, 1998 are given here:

1. Anonymity Principle: This principle states that individuals in a society may be ranked on the basis of their incomes from richest to poorest. But in such a distribution which individual ranks in which position is not important. It is the income rank which is important in understanding inequality and not the individual. For example individual A may be at rank 5 and individual B at rank 3 and later A may be at rank 7 and B on rank 2. It doesn't matter who the individual is, what matters is the income at rank 1 or 2 or 3 and so on.

The change in position of an individual does not signify inequality. (though, her/his personal well-being gets affected)

2. Population Principle and the Relative Income Principle:

The population size does not matter in measuring inequality. It is the proportion of income that goes to a population size which matters in understanding inequality.

A particular population size may be big or small; its relative poverty is determined not by total number of people and total income but by the proportion of income received from the total income of the economy.

For example, Let there be a total income is ₹ 1,00,000 which is to be shared in a total population size of 10,000.

Now,

One size 'x' of the population which constitutes 40% of the total population receives only 15% of the total income to share among them. We can state this in absolute numbers that 4,000 people receive a share of ₹ 15,000 as a whole group.

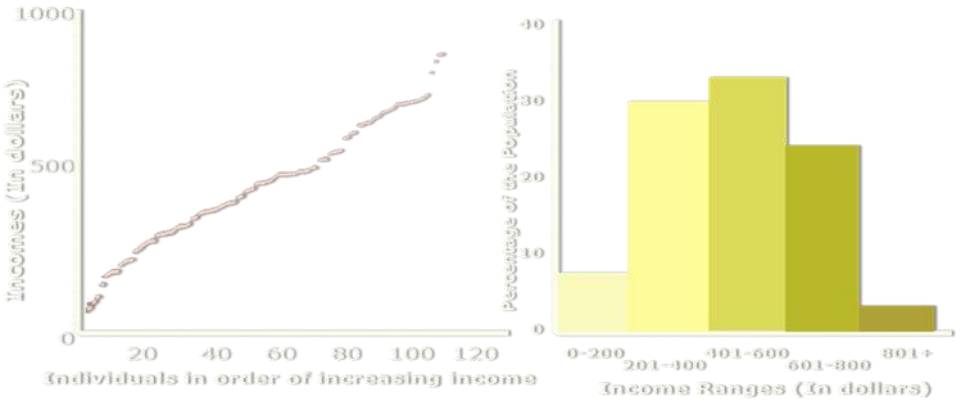
Now if the population size doubles to '2n' and the national income doubles to ₹ 2,00,000 and group 'x' which is 40% of the population still receives 15% of the total income then inequality is the same as before.

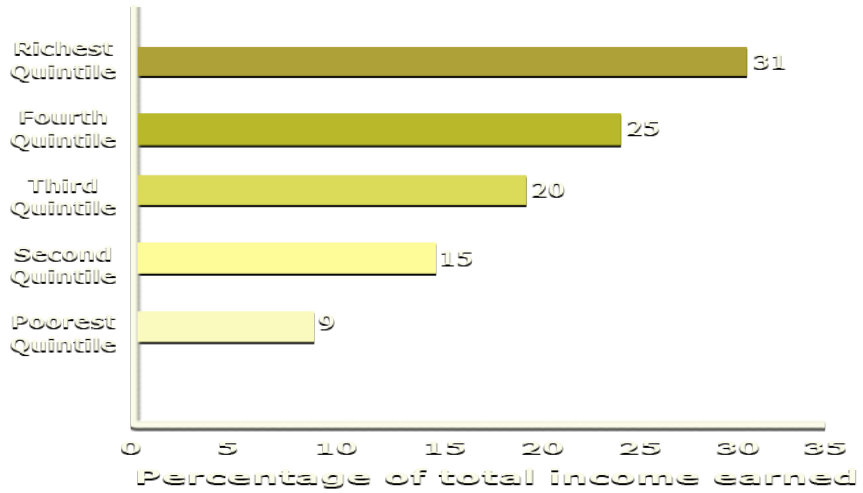
Income distribution is said to improve if the percentage of total income going to a proportion of population increases.

Hence, proportion of population matters and not the size of population or the number of people

And, in measuring inequality, the relative distribution of income matters and not the absolute income

For instance, the inequality of income between incomes of two persons as ₹ 1,000 and ₹ 3,000 respectively is the same as that of ₹ 2,000 and ₹ 6,000.





Graph 1 here shows the population principle where we show percentage of population in various income ranges.

The second graph here shows the relative income earned by different percentile groups of population.

3. The Dalton Principle: This principle is also called the Pigou-Dalton principle (Pigou, 1912; Dalton, 1920).

According to this principle, a transfer of income from the "not richer" to the "not poorer" individual is a regressive transfer and it increases inequalities.

If income distribution **'B'** is derived from income distribution '**A'** by making a series of regressive transfers then **'B'** is a more unequal distribution than **'A'**.

For example, in a society of four individuals with income distribution as,

A = [50, 100, 400, 700],

if we transfer ₹ 25 from the first person the second person then it is regressive transfer and the distribution is now

B = [25, 125, 400, 700].

Now if we transfer ₹ 150 from the fourth person to the third person in the initial distribution then it is progressive transfer and the distribution thus obtained is,

C = [50, 100, 550, 550]

Let us make regressive and progressive transfers simultaneously in the initial distribution to obtain distribution

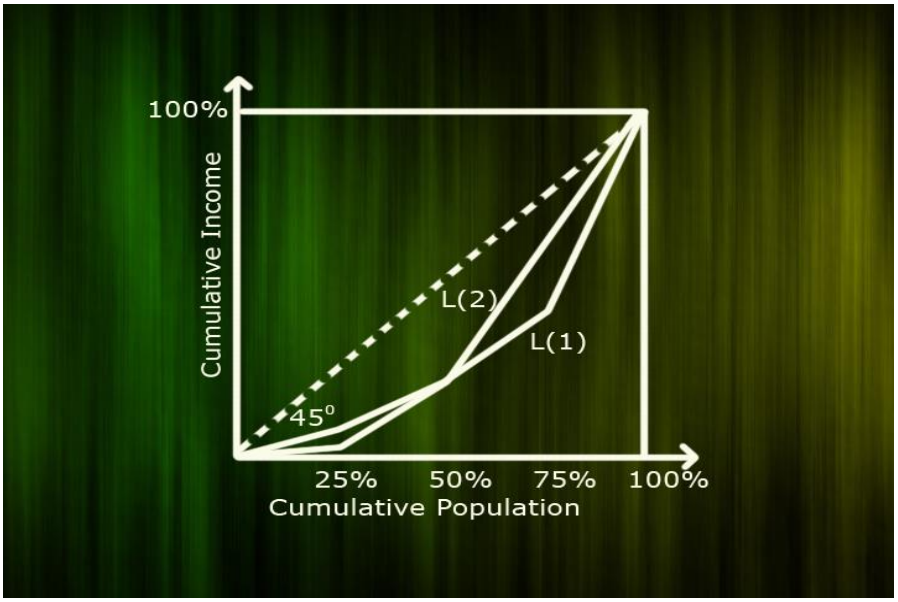
D = [25, 125, 550, 550].

Now, draw Lorenz curves for the initial distribution and this distribution and compare distributions 'A' and 'D' for inequality.

3. Limitation of Lorenz Curve in Expressing Inequality

We have learnt about Lorenz curve in one of our earlier lectures.

It is only a picture and does not quantify inequality. If two Lorenz curves cross each-other then the inequality of the two income distributions cannot be ranked. Look at the picture here.



In this picture, there are two Lorenz curves (L_1 and L_2) crossing over each other and hence we cannot explain the Dalton principle by making regressive transfers. There must be both progressive and regressive transfers simultaneously in going from one curve to the other.

4. Some Quantitative Measures of Inequality

1. Range: It is the difference between the incomes of the rich and the poor divided by mean of the income distribution. (Note that when we divide it by the mean, it represents the average range of difference between the rich and the poor and at the same time becomes independent of the units in which income is measured.)

Range (R) $= \frac{1}{\mu}(y_m - y_1)$

Where,

y_m = highest income class

y_1 = lowest income class

μ = mean of income distribution which is given as,

$\mu = \frac{1}{n}\sum_{j=1}^{m} n_j y_j$

where,

1 to m are the income classes in the entire distribution

n_j = total number of individuals in income class j

y_j = the income of the income class j.

However, this measure pays no attention to the people between the highest and the lowest incomes.

This measure can also not satisfy the Dalton principle because, if some transfers are made from the second poorest individual to the second richest individual then range will remain unchanged. While according to Dalton principle, the inequality must increase.

2. The Kuznets' Ratios: Simon Kuznets gave these ratios to explain the proportion of total income share received by the richest 10% and the poorest 20% or 40%.

In a way these ratios serve as a means to express the Lorenz curve.

3. The Mean Absolute Deviation: According to this measure, the average distance of actual incomes from the mean income is considered to be inequality.

$M_d = \frac{1}{\mu n}\sum_{j=1}^{m} n_j \left|y_j - \mu\right|$

We take sum of all the individual income deviations from the mean income and divide it by total income.

Modulated values are taken to avoid the negative differences.

(Total income can also be taken as μn, that is, average income multiplied by number of persons)

In this distribution, if there is an income y_k which is below the mean income and y_j which is above the mean income then any transfer from y_k to y_j will prove the Dalton principle as the inequality shown by Mean Deviation will increase by such a regressive transfer.

But if, there are two individual incomes y_i and y_j above the mean such that $y_i < y_j$ then any transfer from y_i to y_j which is regressive will not be reflected in Mean Deviation if it is a transfer of small amount; as there will be no difference in the sum of the absolute difference from the mean.

Thus, Dalton principle cannot be applied.

4. The Coefficient of Variation: If larger weight is assigned to the deviations from the mean then any regressive transfer on any one side of the mean will also have a significant impact on the deviation values.

Hence, if we square the deviations, this weight automatically increases and any regressive transfer even on any one side of the mean will be reflected.

The measure of Standard Deviation does this.

$S_d \sqrt{\sum_{i=1}^{m} \frac{n_j}{n} (y_1 - \mu)^2}$

The coefficient of variation is then given as

CV= $\frac{1}{\mu} \sqrt{\sum_{i=1}^{m} \frac{n_j}{n} (y_1 - \mu)^2}$

The measure of CV shows inequalities in Lorenz curve. (It is Lorenz consistent.) It also satisfies the Dalton principle in all types of regressive transfers.

5. The Gini Coefficient: The Gini coefficient is a widely used measure of in equality. It takes the difference between all pairs of incomes and simply totals the absolute differences.

It thus expresses inequality as a sum of income differences between all conceivable pairs of incomes.

(All such differences are divided by n^2 because, when all such pairs are added, there are n^2 such pairs.)

Gini Coefficient (G) = $\frac{1}{2n^2\mu} \sum_{j=1}^{m} \sum_{k=1}^{m} n_j n_k \left| y_j - y_k \right|$

The differences are modulated to avoid the negative differences.

The Gini coefficient is also Lorenz consistent and satisfies the Dalton principle like the Coefficient of Variation.

We have seen the expression of Gini Ratio in one of our earlier lectures.

Look at the table here which gives Gini coefficient for various countries.

Country	Gini coefficient
Japan	.32
UK	.33
India	.34
USA	.41
China	.42

5. Summary

In this session we have seen the various criteria for measuring inequality and the various measures of inequality.

We must remember the criteria for measuring inequality, the Dalton principle and the formulae for various tools which help in measuring inequality.