
UNIT 8 INEQUALITY*

Structure

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8.0 OBJECTIVES

After going through this Unit, you should be in a position to:

- Explain the concept of inequality;
 - Identify the axioms of inequality;
 - Discuss the measures of inequality;
 - Critically examine the measures of inequality; and
 - Explain the relationship between economic growth and inequality
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8.1 INTRODUCTION

Distribution of income in a country has always been an important topic of debate in all the nations. Economic growth in a country indicates country's development but this is not a sufficient indicator of development. If the economic growth distributes the income in a country more unequally, then there is a role of the government to try and mend it in a manner that the distribution is more equal than unequal. We begin with understanding the concept of inequality, in particular the economic inequality. Afterwards, the axioms which need to be met by the appropriate inequality index are discussed. There are various indexes which measure the inequality, some of them are explained. Finally, we discussed the relation of economic growth and inequality.

8.2 CONCEPT OF INEQUALITY

Why would one be interested in understanding the inequality in the resource (income/wealth) distribution? There are two reasons: philosophical and ethical

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grounds for aversion to inequality per se and the functional reason. The philosophical and ethical grounds mean that the individuals having different level of access to lifetime economic resources should not be treated differently for that reason. Descendants have to face the consequences of the ancestors' limited economic resources. On the other hand, parents' right to bequeath their wealth to their children also leads to some individual inheriting more than sufficient wealth. So, it is like two sides of the same coin. Bequeathing wealth seems to be a good way as well as an unfair means to perpetuate inequality. If one does not care about inequality at an intrinsic level and just cares about the overall economic growth, we say that the person cares about inequality at the functional level. It means the reason for caring about inequality is because inequality has an impact on economic features which one cares about.

There are many economic interpretations, ideological and intellectual stances of inequality. Its definition may depend on what stance one takes. Which way one divides the given cake would be parallel to the way an actual income distribution deviates from a benchmark for distributing income. Hence, there is a scope of having different views about the degree and size of inequality, its relevance and attached policies.

Income conditions are often used as a good proxy for understanding economic conditions because income is positively correlated to the living standards and other wellbeing indicators. But only the income inequality does not shape up the economic inequality. Inequality of opportunities is as important as inequality of outcomes; they both are related as well. Let us take an example of an individual who is talented but cannot afford good education which means he is facing inequalities of opportunities. As a result, he is likely to have a low-income level which indicates inequality of outcomes.

8.2.1 Economic Inequality

Economic inequality is the fundamental cause that provides diverse choices one individual and denies to another. It is related to the concepts like lifetime, capabilities, political freedom, contribution to society. Let us look at few situations which show us this: There are two individuals, one earning more than the other but living in a country which denies him freedom like right to vote or travel. Similarly, one individual earning more than the other till a specific age and after that earns less than the other individual. So, economic inequality cannot be well-defined. It depends on whether we are choosing to look at the distribution of current income, distribution of wealth or distribution of lifetime income. The current income shows the inequality at a point of time and such inequalities, if are temporary, are not damaging either from the ethical point of view or the effect on economic systems point of view. For example, there are two countries having only two levels of incomes prevailing: in country A \$2,000 per month and \$3,000 per month. In country B the income levels are \$1,000 per month and \$4,000 per month. Income is more dispersed in country B as compared to country A. If we look at the average income, it is same in both the countries. Let us say in

country A, people enter their working life at one of the two levels of income but stay there forever. In country B people exchange their jobs each month between the low-paid job and the high-paid job. If we measure inequality at any one point in time, country A seems to be more equal but in terms of average yearly income, each individual earns same amount in country B. It means sticky or fluid jobs have an implication on understanding the real scenario of income distribution.

Now let us look at inequality from another perspective. Beyond the importance we give to how much people earn we should also try to look at not only how it is earned. Having this perspective as a background, let us understand what is functional and personal income distribution. Functional distribution is all about the returns to different factors of production, such as labour with various skills, capital equipment of different kinds, land, and so on. These factors of production are not owned by the individuals in a society in an equal proportion. A given household receives different categories of income. The pattern and magnitude of the ownership of factors of production decides the flow of the various categories of income to a household. Some households will receive only wage income as they own only their labour. But some households will receive rent, profit and wages as per their ownership of all three factors of production. When we combine the functional distribution of income with the distribution of factor ownership, we reach at the personal distribution of income which describes income flows to individuals or households and not to the factors of production. So, we can say that the functional distribution tells us about the relationship between inequality and growth and for our understanding of economic inequalities, it is imperative that we understand both how factors are paid and how factors are owned.

8.3 AXIOMS OF INEQUALITY

We talk a lot about an egalitarian society but it is not an easy endeavour. At a given time one is facing various alternative income distributions and which one is relevant and appropriate is a big challenge. The measures of inequality tell us how to measure but how to rank or order these measures is also to be understood. Using axioms help to choose among different inequality indexes. The measures themselves will be discussed in the next section. So, axioms are some desirable properties or characteristics which these inequality measures/indexes should possess. Alternate measures then will be able to be compared based on these axioms. Let us now discuss the axioms which are desirable to be met by the inequality measures. If the criterion is weak then many inequality measures will be able to meet that criterion and vice versa.

Axiomatic approach to choose measurement of inequality indicates that we choose an inequality index because it meets some desirable properties. The four axioms which should be possessed by a measure of inequality are: (i) the anonymity principle; (ii) scale independence principle; (iii) population independence principle, and (iv) transfer principle.

i) The anonymity principle: this principle states that the inequality measure does not identify and classify the individuals in to different classes like rich,

poor, good and bad. The measure possessing this axiom will be silent about the quality of the people.

ii) The scale independence principle: this axiom indicates that size of the economy does not dominate the measure of inequality. It means that the measure shall not be based on the fact whether the economy is rich or poor, overall. The dispersion in the income in the economy is of the interest and not the magnitude.

iii) The population independence principle: this axiom demands that the measure should not be based on the number of people who receive income. It means that the measure needs to be independent of the size of the population.

iv) The transfer principle(the Pigou-Dalton principle): this axiom requires the inequality measure to change when income transfers occur among individuals in the income distribution. This means that with a progressive transfer (income transfer from rich to poor), the inequality index should fall and vice versa in case of regressive transfers (income transfer from poor to rich).

Check Your Progress 1

1) What do you understand by the term ‘Inequality’? Explain.

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2) Discuss Economic inequality.

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3) Explain any two axioms which should be possessed by the inequality measures.

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A perspective was discussed in section 8.2, i.e., looking at the concept of inequality from the lens of personal income distribution and the functional distribution of income. This section discusses the measures of income inequality from that perspective.

8.4.1 Personal Distribution of Income

This approach considers the total income earned by an individual. All the individuals earning same annual income will be considered in the same income

group even if they have invested different number of work hours to earn that income. Location-based and occupational sources of income are not considered. An individual earning larger personal income will be considered in higher income group. Overtime, various measures of inequalities have been developed keeping personal distribution of income approach in mind. Few are discussed below:

1) Lorenz Curve

Lorenz curve is the most common and widely known measure of income inequality. An American economic statistician, Prof. Max D. Lorenz proposed this curve. He utilised this curve to measure disparities in the distribution of income. This curve is a cumulative frequency graph. It is applied to present data relating to the population and the wealth distribution in a country. The population and income components are needed to construct this curve. The figures are required in percentage terms and then arranged in to a cumulative frequency distribution. From the origin a straight line is drawn which ends at the coordinate of 100 percent income and 100 per cent of population. This straight line is known as the Line of equal distribution. This line acts as a benchmark to measure how much of inequality exists in a country. If actual distribution of income in a country is coinciding with the line of equal distribution, then it means the country faces no inequality of income. As the actual distribution curve keeps deviating from the line of equal distribution, the income inequality keeps rising in a country. Farther the actual distribution curve from the line of equal distribution, more is the income inequality. In Figure 8.1, Y-axis represents cumulative percentage of income and X-axis represents cumulative percentage of population. We draw the line of equal distribution by joining the 100 per cent points on both the axes. The figure shows two Lorenz curves for two countries i.e., country A and country B. The Lorenz Curve relating to country B is further away from the line of equal distribution as compared to country A. Hence, we can infer that there are more disparities in the distribution of income in country B than in country A.

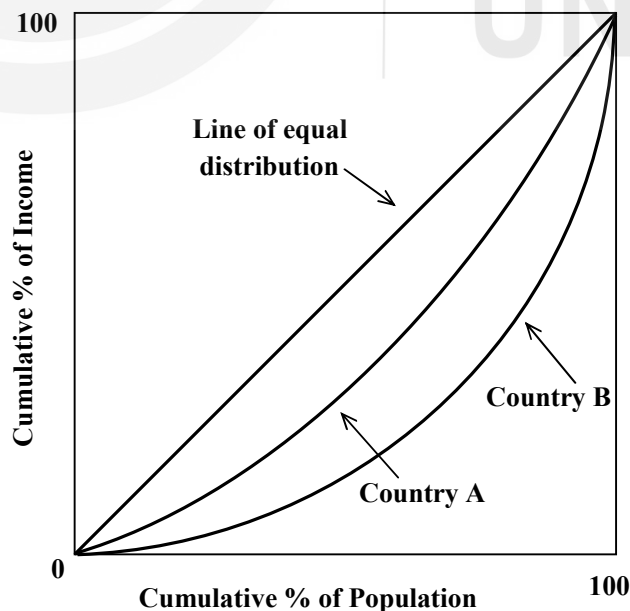


Fig.8.1 Lorenz Curve

We can observe that the Lorenz curve possesses the principles of anonymity, population, and relative income, because the curve does not utilise any information on income or population magnitudes but only retains information about income and population shares. But there are two problems with it. Mostly the researchers of policy makers need to look at inequality in the form of a number because that is more concrete and quantifiable as compared to a graph. Also, any kind of inequality rankings cannot be provided by the Lorenz curves if they cross. This means that an inequality measure that provides us with a number for the income distribution would be perceived as a complete ranking of income distributions. It would mean that in some situations, inequality measures tend to disagree with one another.

2) Quintile Distribution

There is away to somewhat handle the non-numerical part of Lorenz curve. The same underlying information on distribution can be presented in a numerical format. World Bank favours the idea of arraying the income distribution by population quintiles (20 per cent of the population). For example, the poorest 20 per cent of India's population earns 8 per cent of the total income or the richest quintile earns 41.4 per cent and so on. When comparing two countries, if one has greater percentage share of income accruing in at least one quintile below the highest and is at least equal in the other three below the highest, the country is said to have 'Lorenz dominance', or to 'Lorenz dominate' the other country.

3) The range

It is a very simple measure to calculate. First, we find out the difference in the incomes of the richest and the poorest individuals. This difference is then divided by the mean to remove the dependence on the units in which income is measured. This is a rather crude measure. It pays no attention to people between the richest and the poorest on the income scale. From the perspective of the axiomatic approach, it fails to satisfy the Dalton principle. Let us see this with the help of an example. Suppose a small transfer from the second poorest goes to the second most rich individual. This transfer will keep the range measure unchanged. Ideally the regressive transfer should lead to a fall in the inequality index/measure. But we can use the range if the detailed information on income distribution is missing. It proves to be quite useful.

4) The Kuznets ratios

In his pioneering study, Simon Kuznets introduced developed these ratios of income distributions in developed and developing countries. These ratios are basically one step advanced than the quintile distribution. These ratios refer to the share of income owned by the poorest $x\%$ of the population divided by the richest $y\%$ of the population, where x and y stand for numbers such as 10, 20, or 40. If the ratio is high, it means society is more equal. These ratios come in handy in situations where detailed income distribution data are missing.

5) The mean absolute deviation

This is the measure that takes advantage of the entire income distribution. It has a simple idea behind it i.e., inequality is proportional to distance from the mean income. Hence, we take all income distances from the average income (mean income), and add them up. Then divide the addition by total income to present the average deviation. This average deviation will be a fraction of total income. It is useful to express the deviation in terms of an absolute deviation denoted by M as the absolute value ignore the negative signs. It looks a promising measure as it takes into account the overall income distribution but it has one drawback: it is often insensitive to the Dalton principle. Let us see how. Assume there are two people with the incomes A and B . A is below the mean income of the population and B is above the mean income of the population which means $A < B$. If a regressive transfer (a transfer from poor to rich) takes place, then the inequality measured by M will rise because the distance of both A and B will go up. Till now the inequality measure is faring well. Now let us take another case. We take any two incomes A and B but this time they both are above the mean income of the population. Again, the regressive transfer takes place from A to B . Let us say the transfer was small enough so that after the transfer also both the income levels A and B are above the mean income. There will be no difference in the sum of the absolute difference from mean income. So, the mean absolute deviation will not register any change in such a case, and hence the Dalton principle fails. The Dalton principle is meant to apply to all regressive transfers, not just those from incomes below the mean to incomes above the mean.

6) Coefficient of Variation

Coefficient of variation (CV) is a relative measure of dispersion of data points around the mean. It is measured as follows:

$$CV = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

If we want the measure in the form of decimal then we remove the multiplication of coefficient by 100. The multiplication by 100 provides us with is the percentage. This measure require that the income is normally distributed. Coefficient of variation presents the extent of deviation from the normal distribution of income. Larger the coefficient of variation, greater will be inequality in the distribution of income and vice versa.

7) Gini Coefficient

This measure of inequality is widely used and is a measure of the relative degree of income inequality in a country. The Gini approach starts from a fundamentally different base. Instead of taking deviations from the mean income, it takes the difference between all pairs of incomes and simply totals the (absolute) differences. It is as if inequality is the sum of all pairwise comparisons of “two-

person inequalities” that can possibly be made. It can be obtained by calculating the ratio of the area between the line of equal distribution (diagonal 45° line) and the Lorenz curve divided by the total area of the half-square in which the curve lies. In Figure 8.2, this is the ratio of the shaded area to the total area of the triangle BCD, i.e.,

$$\text{Gini coefficient} = \frac{\text{Shaded region}}{\text{Area of the triangle BCD}}$$

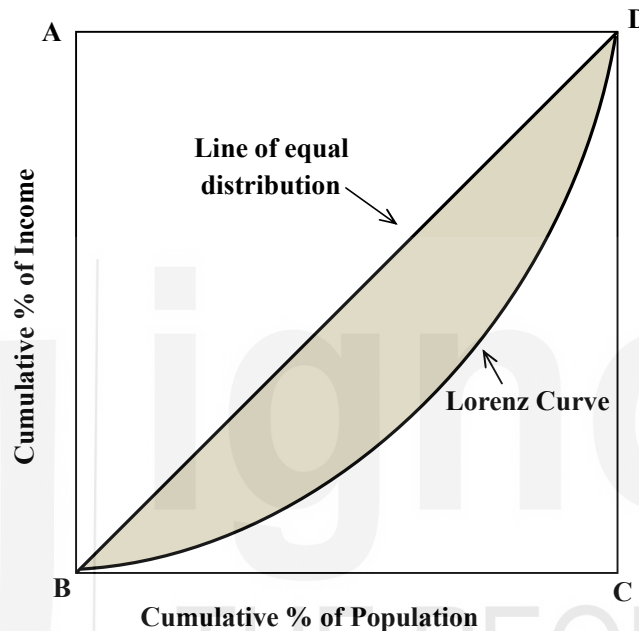


Fig. 8.2 Gini Coefficient

This ratio is known as the Gini Concentration Ratio or the Gini Coefficient, after the Italian statistician C. Gini, who first formulated it in 1921. It very closely related to the Lorenz curve Recall that the more “bowed out” the Lorenz curve, the higher is our intuitive perception of inequality. It turns out that the Gini coefficient is precisely the ratio of the area between the Lorenz curve and the 45° line of equal distribution, to the area of the triangle below the 45° line. Gini coefficients are aggregate inequality measures which can vary from 0 (perfect equality) to 1 (perfect inequality). It is generally found that if the Gini coefficient lies between 0.5 and 0.7, then the distribution is a highly unequal distribution. And if the Gini coefficient is in the range of 0.2 to 0.5, then those countries have relatively equitable distribution. The Gini coefficient meets all four principles and is therefore Lorenz-consistent, just like the coefficient of variation.

8.4.2 Functional Distribution

The functional distribution or factor share distribution represents the percentage of income received by one factor of production in comparison to the income received by other three factors of production. In particular it’s the share of labour in total income compared to the share of total income received in the form of rent, interest and profits. The significance of this measure is that it attempts to

explain the income of a factor input in terms of the contribution the factor makes to the total output. The unit prices of each factor of production are reached at with the help of supply and demand curves. Each factor market has its own market where it is supplied and demanded. At the equilibrium in these factor markets we receive the equilibrium prices and quantities of these factors. Factors receive their rewards on the basis of their function. The drawback of this approach is that it fails to consider the role and influence of non-market forces on the factors of production. Non-market forces are those which influence the equilibrium of the market but not directly like the bargaining power of the trade unions which affect the wage rate, power of monopolists who manipulate the prices of capital or land.

8.5 INEQUALITY AND DEVELOPMENT

Debate on the relationship between economic development and income inequality has always prevailed. The effect of economic growth on poverty depends on the level of economic inequality existing in a country. Economic growth increases the income inequality if it benefits the rich in a country which already has high inequality. On the other hand, if the inequality reduces due to well-targeted policies, then the poverty reduction goal seems to be achievable. Hence, it is important that we understand the link between income inequality and economic development. The literature on the economic development-income inequality nexus in industrial society also places emphasis on the causes of current social inequality. But we will explain two main studies which describe what happens to the distribution of income as a result of economic growth in a country.

8.5.1 Kuznets' Inverted-U Hypothesis

Simon Kuznets, an economist, proposed a particular relationship between the income distribution and economic growth. He explains the journey of income inequality when an economy develops from a primarily rural agricultural society to an industrialized urban economy. He said that the relationship is of an inverted U. This inverted U curve is known as the Kuznets' curve. The same has been presented in Figure 8.3. We observe that at the initial levels of economic growth, the income inequality widens. Afterwards, the inequality stabilises at a given level of economic growth, and finally falls in the advanced stages of growth.

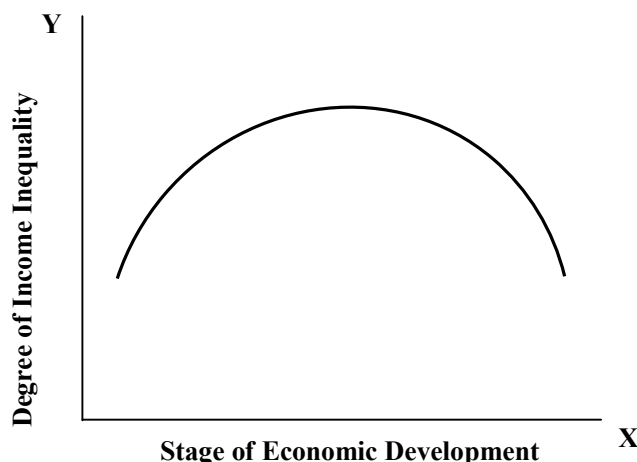


Fig.8.3 Kuznets' Curve

Kuznets says that the widening of income inequality in initial stages of growth is due to the structural changes an economy goes through as the growth takes place. The urban sector receives more weight during that time so the economic activity takes place in favour of the urban sector characterised by higher productivity. But in the later stages of economic growth, the relation reverses. As a country industrialises, the center of the economy shifts from rural areas to the cities as rural laborers, such as farmers, begin to migrate seeking better-paying jobs. Due to the influx of rural migrants to the urban areas, the rate of growth in urban labour becomes high. When the rate of expansion in the urban-high productivity sector is higher than the increase in the rate of growth of the urban labour force, the income differentials will reduce as the population in rural areas fall. But this stage may never be achieved by the nations which experience high rate of population growth. Early evidence suggests that developing countries appear to have higher inequality, on average, than their developed counterparts.

But today, the world looks very different than it did in 1955 when Kuznets proposed the inverted U relationship. In the past decades, economic inequality in the United States and other wealthy/developed nations has risen sharply which has induced a renewed the quest to know how the changes in income distributions affect economic wellbeing. Over the same time period, economic inequality has persisted and even grown in many poorer economies.

8.5.2 Gary S. Fields's Prediction

Gary S. Fields has offered predictions about how the inequality will behave as the economic growth takes place. He found the Lorenz curves very relevant and has used them for his predictions. He discusses three different situations: 1) traditional-sector enrichment growth typology; 2) modern-sector enrichment growth typology, and 3) modern-sector enlargement growth.

1) Traditional-Sector Enrichment Growth Typology

As the name suggests, the traditional sector workers receive the benefits of growth, while there is little or no growth taking place in the modern sector. This kind of pattern will be noticed in those countries which have low incomes as well as low growth rates and choose to work towards reduction of absolute poverty. This kind of growth leads to higher-income and hence a more equal relative distribution of income as well as less poverty. Diagrammatically, it means that the Lorenz Curve shifts uniformly upward. This new shifted curve will be close to the line of equality as shown in Figure 8.4.

2) Modern-sector Enrichment Growth Typology

This kind of growth limits its benefits to the people who are engaged in the modern sector. The wages and number of workers in the traditional sector remains more or less constant. It is easy to foresee that this kind of growth results

in higher income only for those who are associated with the modern sector and that leads to a less equal relative distribution of income and nearly no change in poverty. Diagrammatically, this growth moves the Lorenz curve uniformly outward and further from the line of equality as shown in Figure 8.5.

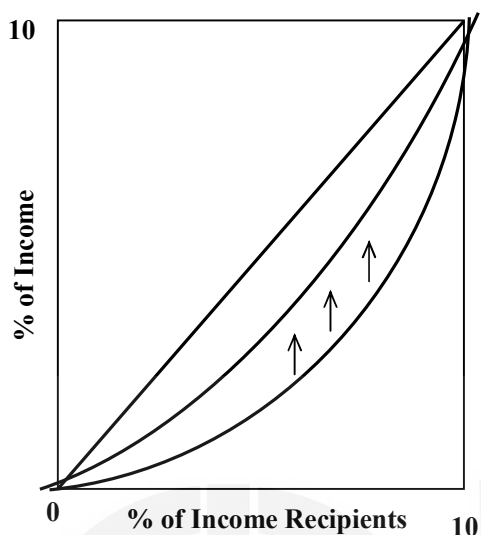


Fig. 8.4

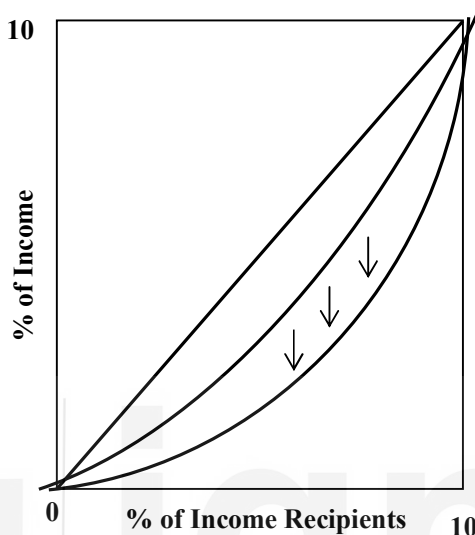


Fig. 8.5

FIGURE 8.4 AND 8.5 SHIFTING LORENZ CURVES

3) Modern-sector Enlargement Growth

This is the case, the two-sector economy is developed by increasing the size of modern sector but maintaining constant wages in both sectors. This is the case depicted by Lewis model. You will study about Lewis model in course BECC 114. In this type of growth, absolute poverty is reduced, but the Lorenz curves will always cross and hence we cannot say with certainty about the changes in relative inequality. Fields believes that if this pattern of growth experience is predominant, inequality is likely to increase in the initial stages of development and then it may decrease. This is shown in Figure 8.6. In the figure two Lorenz curves intersect each other. This happens because the poor who remain in the traditional sector have their incomes unchanged, but these incomes are now a smaller fraction of the larger total, so that the new Lorenz Curve, L_2 , lies below the original Lorenz curve, L_1 , at the lower end of the income distribution scale. Workers associated with the modern sector receive the same absolute income as before, but now the share received by the richest income group is smaller, so that the new Lorenz curve lies above the original one at the higher end of the income distribution scale. Therefore, somewhere in the middle of the distribution, the new and the original Lorenz curves must cross.

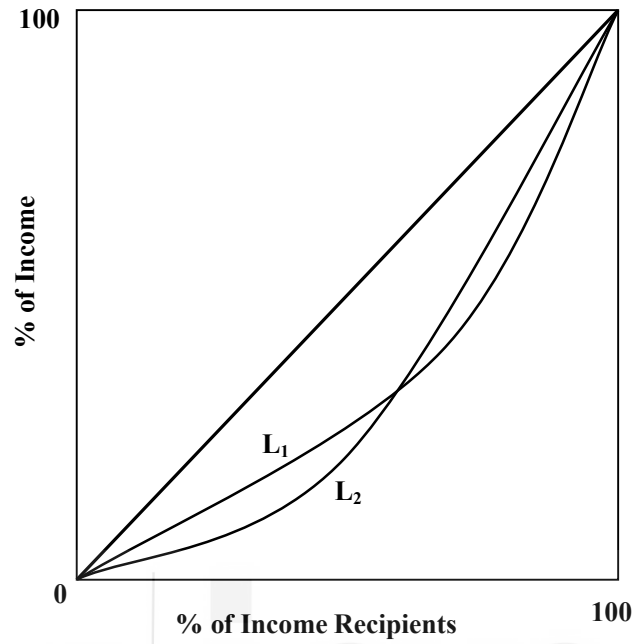


Fig. 8.6 Crossing Lorenz Curves

In a nutshell, Gary Fields says,

- with traditional-sector enrichment inequality would fall gradually;
- with modern-sector enrichment, inequality would rise gradually;
- with modern-sectorenlargement, inequality would first fall and then rise.

Check Your Progress 2

1) Explain what is Lorenz Curve with the help of a diagram.

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2) Discuss the following measures of inequality: a) Range b) Coefficient of variation.

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3) What was the hypothesis presented by Simon Kuznets? Discuss his work in relation to inequality and economic growth.

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4) Mention the drawbacks of any two inequality measures.

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5) Explain the functional distribution measure of inequality.

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8.6 LET US SUM UP

Inequality is a concept which has to be dealt by all the countries. We began the unit by discussing the concept of inequality with specific reference to economic inequality. The personal income distribution and functional distribution are two perspectives from which we can understand the concept of inequality. To measure the inequality, one needs some kind of measures. These measures will be able to justify their role only if they meet certain axioms. We explained four axioms (the anonymity principle; scale independence principle; population independence principle, and transfer principle) which are very important in order to measure inequality in any country. Afterwards we discussed the measures such as the Lorenz curve, Gini coefficient at length. The relationship of economic growth and inequality was also examined with the help of famous Kuznets curve predictions of Gary S Fields. The economic growth increases the inequality initially and at later stages of growth, the inequality reduces.

8.7 ANSWERS/HINTS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) Refer section 8.2
- 2) Refer sub-section 8.2.1
- 3) Refer section 8.3

**Inequality and
Poverty**

Check Your Progress 2

- 1) Refer sub-section 8.4.1
- 2) Refer sub-section 8.4.1
- 3) Refer sub-section 8.5.1
- 4) Refer sub-section 8.4.1
- 5) Refer sub-section 8.4.2

