

A Pair of Social Welfare Functions and a New Measure of Inequality

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Welfare judgement on income distribution has often been made on the basis of weighted sum of individual incomes, the weights being based on some notion of relative deprivation. In a recent contribution to this Journal, Chakrabarty (1995) proposed a set of weights leading to a Social Welfare Function (SWF) based on Theil's entropy measure, not normalised. This paper proposes two more sets of weights leading to a pair of SWFs with similar properties and interpretations. Properties of a new measure of inequality derived from these SWFs are also scrutinised.

1 The Perspective

Welfare judgement on income distributions has often been made on the basis of weighted sum of the individual incomes.¹

$$W(Y) = \sum w_i y_i \quad \dots(1)$$

where $Y = (y_1, y_2, \dots, y_n)$ is the income profile of n individuals in the community, y_i being income of the i^{th} individual.

The traditional measure, per capita income μ , attaches equal weights $w_i = (1/n)$ to each income and, hence, is insensitive to the distribution of income among individuals.

$$\mu = \frac{1}{n} \sum y_i \quad \dots(2)$$

The measure will be sensitive to distribution if the weights are made unequal. The resulting SWF will depend on the set of weights chosen.

The twin concerns in assessment of social welfare by income are its level, represented by mean income and distribution summarised in a measure of inequality. Preference for higher income and lower inequality is very widely shared. Any acceptable measure of aggregate welfare $W(Y)$ based on income should, therefore, be an increasing function of mean income and a decreasing function of inequality. Scholars like Sen and Kakwani while choosing the weights through axiomatic approach have made allowances for this.

In a pioneering work Sen (1974) proposed a set of axioms which determine the weights w_i in (1). Sen's set of axioms recommended - (i) higher weights to lower income to reflect preference for distributional equity, (ii) mean income μ as the measure of aggregate welfare when there is no distributional inequity - everybody enjoying same income, (iii) the weight w_i attached to income y_i , to be proportional to the number of individuals with income equal to or more than that of the individual i .

Sen also argued that the weights w_i should be based on some notion of relative deprivation. The lower an individual is on the welfare scale (measured by income) the

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¹ All summations in this discussion range between $i-1$ and $i-n$. Since there is no chance of confusion the range is omitted for convenience of printing.