

Measuring Income Inequality: The Journey from Relative Mean Deviation to Gini

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In the history of development of ideas about measurement of income inequality three measures viz., Relative Mean Deviation R, Relative Mean Difference D and Gini coefficient G played significant roles. Equivalence of D and G is well-known. This paper looks into the relationship among these three measures and the Lorenz curve to demonstrate that D and G are really generalizations of the primitive measure R.

Introduction

Growth of aggregate income (GDP) and its distribution among the citizens has attracted attention of almost all sections of the population. Economists are interested in it because of its relevance in estimating the volume of savings and demand for consumption of various items. Planners and administrators like to know the level of inequality and aggregate welfare flowing out of the current income profile and also the trends in these. Politicians and the public, in general, are often interested to know who enjoys what share of income. Thus, though for different reasons income distribution and its inequality content are of interest to almost everybody. No wonder then that development economists and statisticians are engaged in conceptualization, measurement and empirical estimation of these and other aspects of income distribution.

Since the beginning of this century when the Lorenz Curve and the Gini Coefficient made their appearance, scholars have proposed various measures of inequality and examined their properties in the context of assessing material well-being. In the history of development of ideas about measurement of income inequality three measures viz., Relative Mean Deviation R, Relative Mean Difference D and Gini coefficient G (Gini for short) played significant roles. Equivalence of D and G is well-known. Objective of this paper is to demonstrate that D and G are really generalizations of the primitive measure R. For this, we look into the relationship among these three measures and the Lorenz curve

This paper is organized as follows: Rest of this section introduces and explains the notations used. Section II recapitulates some desirable properties and deficiencies in Relative Mean Deviation. Section III recapitulates some properties of the Lorenz curve and some measures of inequality based on it. Section IV discusses some relationships among the Lorenz curve, the Gini and Relative Mean Deviation to demonstrate that Gini can be seen as a generalization of Relative Mean Deviation.

I Income Profile

We begin with and shall keep in constant view the income profile

$$Y = (y_1, y_2, y_3, \dots, y_n) \quad \dots (1.1)$$

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