

Estimation of Lorenz Curve and Gini Co-Efficient from Grouped Observations

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1. INTRODUCTION

In the discussions of the size distribution of income reference is frequently made to summary measures of inequality. Many alternative measures of inequality have been proposed from time to time motivated by certain theoretical considerations or, more appropriately, theoretical intuitions. Gini Coefficient is one of the oldest of such measures proposed. All of these measures are reasonable but arbitrary from the point of view of their welfare implications. None has a conspicuous advantage over the rest.¹ The Gini Coefficient has been the most widely used in empirical work. This is, possibly, because of its simple relation with the Lorenz curve and a number of intuitively appealing elegant properties (Kakwani, 1980). It is not surprising that analysis and criticism of Gini Coefficient and Lorenz curve constitutes a major part of the growing literature on inequality, its measurement and interpretation. Many of the alternative measures proposed in recent times are, in fact, outcomes of these analyses and criticism mostly focusing on its welfare implications.² However, Lorenz curve and Gini coefficient have remained the most popular and powerful tool in the analyses of size distribution of income - both empirical and theoretical.³ In empirical studies of income distribution estimates of Lorenz curve and Gini coefficient are obtained from, grouped data - either in the form of fixed size classes of income or percentile distributions. One approach has been to approximate the distribution of households by income using some well known density function such as Lognormal, or Gamma and then derive the equation to the Lorenz curve in terms of the parameters of the fitted distribution. The Gini coefficient is obtained as a function of these parameters. By substituting the estimates of these parameters in the respective expression one gets estimates of the Lorenz curve and Gini coefficient. The shortcoming of such an approach is that none of the known density functions gives a reasonably good fit to the actual data.⁴

An alternative approach, often followed, is to estimate the Lorenz curve by approximating this by a function which fits the data reasonably well. This procedure does not need