

Inference for Lorenz Curves

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ABSTRACT

The *Lorenz curve*, introduced more than 100 years ago, is still one of the main tools in poverty and inequality analysis. International institutions such as the World Bank collect and publish grouped income data in the form of population and income shares for a large number of countries. These data are often used for estimation of parametric Lorenz curves which in turn form the basis for most poverty and inequality analyses (see e.g. the World Bank website *Povcal.net*). Despite these facts and the existence of well-developed distribution free methods, current approaches to parametric estimation of Lorenz curves including the one used by the World Bank lack solid statistical foundations. In this paper we propose a sound statistical framework for making inference about parametric Lorenz curves for both grouped and individual data. Building on two data generating mechanisms, efficient methods of estimation and inference are proposed and a number of interesting results are derived. The resulting two methods of inference are compared with each other and with conventional estimation methods both theoretically and using simulated data. We also consider the World Bank method of Lorenz curve estimation and show how the proposed methods can indeed improve their estimates. Recommendations are made for improving current practices.

Keywords: Minimum Distance, GMM, GB2 Distribution, General Quadratic, Beta Lorenz Curve, Gini Coefficient, Poverty Measures, Quantile Function Estimation

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