Fast Jackknife Variances for Classical and Bias-Corrected Theil Indices in Inequality Studies

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Abstract

Economic inequality is a vital topic in research and political issues. This phenomenon is usually measured using Theil indices, which belong to the popular generalised entropy family. Computation of variances for the Theil indices is crucial topic for assessing uncertainty and facilitating comparisons across regions or over time. While the Jackknife method is a popular tool for variance estimation, its computational demands can become prohibitive with large samples or studies involving replications. We introduce simplified Jackknife formulas for Theil indices, addressing these computational challenges. Additionally, we tackle the bias inherent in Theil estimates, particularly in highly skewed distributions, by defining Jackknife bias-corrected estimators and deriving their fast variance formulations. Monte Carlo simulations confirm the proposed methods are computationally faster than the classical Jackknife variance estimator. Therefore, this contribution is a very interesting tool for inequality studies based on large samples or research involving Monte Carlo simulation studies.

Keywords

Income inequality, Theil, Jackknife, bias, Monte Carlo.

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