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Inverting the indirect - the ellipse and the Boomerang: Visualising the confidence intervals of the structural coefficient from two-stage least squares

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Inverting the Indirect - The Ellipse and the Boomerang: Visualising the Confidence Intervals of the Structural Coefficient from Two-Stage Least Squares. [1]

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Abstract:

In the just-identified model the exact distribution of the two-stage least squares (2SLS) estimator of the coefficient of the endogenous regressor is a ratio of two normally distributed random variables. Robert Basmann (1960, 1961, 1974) used Fieller's 1932 result to derive the density function of the estimator. In this paper we present a novel graphical exposition of Fieller's 1954 technique to approximate the confidence interval for the 2SLS estimator. We use this approach to examine how the degree of endogeneity and instrument relevance influences the correspondence between the Fieller and traditional asymptotic confidence intervals for the estimator.

Key words: Indirect Least Squares, Inverse Test, Fieller Method, Anderson and Rubin Test, Delta Method

JEL: C12, C26, C36, C18

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[1] We have greatly benefited by the comments of the referees for this paper. The usual caveat holds.