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Approximate Distributions of the Likelihood Ratio Statistic in a Structural Equation with Many Instruments

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Abstract: This paper studies properties of the likelihood ratio (LR) tests associated with the limited information maximum likelihood (LIML) estimators in a structural form estimation when the number of instrumental variables is large. Two types of asymptotic theories are developed to approximate the distribution of the likelihood ratio (LR) statistic under the null hypothesis $H_0: \beta = \beta_0$: a (large sample) asymptotic expansion and a large- K_n asymptotic theory. Size comparisons of two modified LR tests based on these two asymptotics are made with Moreira's conditional likelihood ratio (CLR) test and the large K t -test.

Key words: Asymptotic expansion, large- K_n asymptotics, many instruments

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