INFORMATION MATRIX TESTS FOR POPULATION DISTRIBUTION HYPOTHESIS IN FINITE SAMPLES

Lai-Fa Hung, Wen-Chung Wang

Department of Psychology, National Chung-Cheng University

This study attempts to explore the issues in hypothesis testing of population distributions, based on Whites' information matrix test (White, 1982). We point out that White's $\nabla D(\theta)$ method requires the computation of the third derivatives of log-density for finding the covariance matrix, which is very labor-intensive and impractical. Chesher (1983) and Lancaster (1984) developed a simpler method of artificial regression where the computation is no longer needed. It is found that White's ω is equal to sample size n multiplied by the coefficient of determination R^2. However, their method is improper when $\nabla D(\theta) = 0$. Accordingly, we propose another estimator to correct the errors in the artificial regression. Without strong theoretical evidence, these three methods are compared through a simulation study in terms of type I error rates. The results show that the artificial regression method tends to over-reject the null hypothesis, White's method yields very satisfactory results. Our method is between these two methods in performance, indicating that our method is simple and effective.

***Keywords*:** White information matrix test, Lancaster artificial regression, Finite samples, Population distributions