Jackknife Empirical Likelihood Test for Equality of Two High Dimensional Means

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Abstract

It has been a long history to test the equality of two multivariate means. One popular test is the so-called Hotelling $T^2$ test. However, as the dimension diverges, the Hotelling $T^2$ test performs poorly due to the possible inconsistency of the sample covariance estimation. To overcome this issue and allow the dimension to diverge as far as possible, Bai and Saranada (1996) and Chen and Qin (2010) proposed tests without the sample covariance involved, and derived the asymptotic limits which depend on whether the dimension is fixed or diverges under a specific multivariate model. In this paper, we propose a jackknife empirical likelihood test which has a chi-square limit independent of the dimension, and the conditions are much weaker than those in the existing methods. A simulation study shows that the proposed new test has a very robust size with respect to the dimension, and is powerful too.

Keywords: Jackknife empirical likelihood, high dimensional mean, hypothesis test.

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