SOLUTION VIA PARAMETRIC BOOTSTRAP FOR THE MULTIVARIATE BEHRENS-FISHER PROBLEM

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- ABSTRACT: In the multivariate cases when there is a need for testing mean vectors of two p-varied normal populations with unknown and different covariance matrices the Behrens-Fisher multivariate problem is characterized. Many approximate solutions were proposed, such as Nel and Merwe (1986), Krishnamoorthy and Yu (2004) and Krishnamoorthy and Lu (2010), among others. Krishnamoorthy and Yu (2004) reinforce that an exact solution with natural properties does not exist and that efforts are needed to develop more efficient solutions. Thus, the objective of this work is to propose a test, for solving the Behrens-Fisher multivariate problem, based on parametric bootstrap, and evaluate its performance, as well as its comparison to the modified Nel and Merwe test and the Krisnamoorthy and Lu (2010) test. The conclusions reached on the test performance were divided into two cases. The first case, in which the covariance matrices of both populations have equicorrelated structure, the PBT is superior to its competitors in all studied situations, including under covariance homogeneity. In the second case, the covariance matrices of the populations involved are non-structured and the PBT should only be used in two circumstances: with small sample size of same size in both samples associated with large number of variables, and in samples with different sizes, also with a large number of variables..

- KEYWORDS: Heterocedasticity; mean vector test; parametric bootstrap; multivariate Behrens-Fisher problem.

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