ASSESSING THE ERROR PROBABILITY OF THE MODEL SELECTION TEST

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Abstract. The asymptotic error probability of Linhart's model selection test is evaluated, and compared with the nominal significance level. We examine the case where the expected discrepancies of the candidate models from the true model are asymptotically equal. The local alternatives method is employed in the limiting operation of the asymptotic evaluation. Although the error probability under the null hypothesis is actually shown to be equal to or less than the level for most situations, intolerable violations of the error control are observed for nested models: It is often erroneously concluded that the smaller model is significantly better than the larger model. To prevent this violation, a modification of Linhart's test statistic is proposed. The effectiveness of the proposed test is confirmed through theoretical analysis and numerical simulations.

Key words and phrases: Akaike's information criterion, model selection, fixed alternatives, local alternatives, test on expected discrepancies, error probability, canonical correlation coefficient.