

ON SCHWARZ TYPE MODEL COMPARISON

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High-frequency sampling; Bayesian model comparison; Locally asymptotically quadratic model; Stochastic differential equation:

We introduce classical Bayesian information criterion (BIC) type statistics which enable us to formulate a unified way of model comparison for quasi-likelihood models of locally asymptotically quadratic type. The proposed statistics, termed as quasi-BIC (QBIC), is applicable even when the asymptotic quasi-information matrix is random, and when the associated quasi-maximum likelihood estimator is of multi-scaling type. Asymptotic results about the logarithmic quasi-Bayes factor (equivalently, the quasi-logarithmic marginal likelihood) are given, resulting in a far-reaching extension of applicable scope of Schwarz's paradigm. In particular, when the model is correctly specified and the estimator is indeed of multi-scaling type, we show that QBIC leads to a stepwise selection-consistency result, based on which full model search may be effectively split and reduction of computational effort may be brought in. Stochastic differential equation models observed at high frequency are discussed in some detail, together with illustrative simulation results.