

# Consistency of Bayes Factor for Nonnested Model Selection When the Model Dimension Grows

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## Abstract

Zellner's  $g$ -prior is a popular prior choice for the model selection problems in the context of normal regression models. Wang and Sun (2014) recently adopt this prior and put a special hyper-prior for  $g$ , which results in a closed-form expression of Bayes factor for nested linear model comparisons. They have shown that under very general conditions, the Bayes factor is consistent when two competing models are of order  $O(n^\tau)$  for  $\tau < 1$  and for  $\tau = 1$  is almost consistent except a small inconsistency region around the null hypothesis. In this paper, we study Bayes factor consistency for nonnested linear models as the model dimension grows. Some of the proposed results generalize the ones of the Bayes factor for the case of nested linear models. Specifically, we compare the asymptotic behaviors between the proposed Bayes factor and the intrinsic Bayes factor in the literature.

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