



Non-Nested Model Selection for Fractional ARIMA Models

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Model selection among fractionally integrated auto-regressive moving average processes (FARIMA) is commonly carried out with the likelihood-ratio test or Akaike-type information criteria (AIC, BIC, HIC). These approaches allow for a discrimination of nested models only. For non-nested models, e.g., FARIMA $[1, d, 0]$ and ARMA $[3, 2]$, one usually has to involve the smallest common model where these two simpler alternatives are nested in, i.e. FARIMA $[3, d, 2]$. The two original models are then tested for being admissible simplifications of the larger one.

There are, however, situations where this procedure has not enough power to discriminate the two alternatives. A direct comparison of the two simpler models has potentially more power. We suggest a simulation approach, based on the likelihood ratio, to discriminate non-nested models of the FARIMA-type. This approach is formulated along the lines of a statistical test, i.e. p -values and power can be estimated. We use simulation studies to investigate to what extent these estimates are reliable in the sense of a statistical test.

Non-nested model selection for FARIMA-type models is especially interesting with respect to the detection of long-range dependence and trend assessment.