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**“Parameter identification in the LSTAR model”**

Abstract:

We propose a new and simple parametrization of the so-called speed of transition parameter of the logistic smooth transition autoregressive (LSTAR) model. We show that the original parametrization of the speed of transition parameter is impracticable and, as a consequence, estimation can result in an arbitrarily large and imprecise parameter estimate that does not correspond to an optimum of the likelihood function. The new parametrization highlights the causes and consequences of the well-known identification problem inherent in time series models with smooth regime switching. It proves useful in analyzing the properties of the likelihood function to identify an estimation and modeling strategy for the empirical analysis. In particular, we investigate the small sample properties of the maximum likelihood estimator in the LSTAR model and discuss how to distinguish between TAR and LSTAR models. Two empirical applications illustrate the usefulness of the new parametrization.