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Asymptotics of ML estimator for regression models with a stochastic trend component. (English) Zbl 0962.62119

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Summary: This paper investigates the asymptotic properties of the maximum marginal likelihood estimator for a regression model with a stochastic trend component when the signal-to-noise ratio is near zero. In particular, the local level model of *A.C. Harvey* [Forecasting, structural time series models and the Kalman filter. (1990; Zbl 0725.62083)] and its variants where a time trend or an intercept is included are considered.

A local-to-zero parametrization is adopted. Two sets of asymptotic properties are presented for the local maximizer: consistency and the limiting distribution. The estimator is found to be super-consistent. The limit distribution is derived and found to possess a long tail and a mass point at zero. It yields a good approximation for samples of moderate size. Simulation also documents that the empirical distribution converges less rapidly to the limit distribution as number of regression parameters increases. The results could be viewed as a transition step toward establishing new likelihood ratio-type or Wald-type tests for the stationarity null.

MSC:

62P20 Applications of statistics to economics
62M10 Time series, auto-correlation, regression, etc. in statistics (GARCH)
62F12 Asymptotic properties of parametric estimators

Full Text: DOI