

On identification of the threshold diffusion processes

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Abstract We consider the problems of parameter estimation for several models of threshold ergodic diffusion processes in the asymptotics of large samples. These models are the direct continuous time analogues of the well known in time series analysis threshold autoregressive models. In such models, the trend is switching when the observed process attains some (unknown) values and the problem is to estimate it or to test some hypotheses concerning these values. The related statistical problems correspond to the singular estimation or testing, for example, the rate of convergence of estimators is T and not \sqrt{T} as in regular estimation problems. We study the asymptotic behavior of the maximum likelihood and Bayesian estimators and discuss the possibility of the construction of the goodness-of-fit test for such models of observation.

Keywords Parameter estimation · Threshold models · Singular estimation · Ergodic diffusion process · Goodness-of-fit test · Cramer-von Mises type tests