

Continuous perpetuities and time-reversal of diffusions

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Abstract

We consider the problem of estimating the joint distribution of a continuous-time perpetuity and the underlying factors driving the economy in an ergodic Markov model. Two approaches are discussed. The first aims at obtaining a PDE characterisation under certain conditions ensuring existence of a density. The second (and more general) approach identifies the aforementioned joint law as the stationary distribution of an ergodic multi-dimensional diffusion using techniques of time reversal, allowing the use of Monte-Carlo simulation for numerical estimation. Connections with ruin probability problems will be discussed. (This is joint work with Scott Robertson, Carnegie Mellon University.)