

Kostas Kardaras  
Professor (Chair in Statistics)  
London School of Economics and Political Science

TITLE: Continuous-time perpetuities and time reversal of diffusions

ABSTRACT: We consider the problem of estimating the joint distribution of a continuous-time perpetuity and the underlying factors which govern the cash flow rate, in an ergodic Markov model. Two approaches are used to obtain the distribution. The first identifies a partial differential equation for the conditional cumulative distribution function of the perpetuity given the initial factor value, which under certain conditions ensures the existence of a density for the perpetuity. The second (and more general) approach, identifies the joint law as the stationary distribution of an ergodic multi-dimensional diffusion using techniques of time reversal. This later approach allows for efficient use of Monte-Carlo simulation when estimating the distribution.