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Continuity Problems in Boundary Crossing Problems

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Computing the probability for a given diffusion process to stay under a particular boundary is crucial in many important applications including pricing financial barrier options. It is a rather tedious task that, in the general case, requires the use of some approximation methodology. One possible approach to this problem is to approximate given (general curvilinear) boundaries with some other boundaries, of a form enabling one to relatively easily compute the boundary crossing probability. We discuss results on the accuracy of such approximations for both the Brownian motion process and general time-homogeneous diffusions, their extensions to the multivariate case, and also some contiguous topics.

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