

Nonparametric Methods to Estimate the Expected Time to Cross Thresholds

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Abstract:

First passage time and, especially, the expected time to cross some thresholds are fundamental concepts in stochastic analysis, and yet they have received little attention in Economics. One of the reasons is probably the difficulty in obtaining a simple procedure to calculate, for example, the expected time (ET) to cross a threshold. In fact, analytical results on first passage time problems are mostly centered on stochastic processes of diffusion type or Markov chains where explicit analytical expressions are available in only a few cases.

First passage time may be a very useful tool in Economics as a way to discuss topics such as the speed of mean-reversion, the time to equilibrium, the time to recovery or recession, etc. We will see that it can even help to build portfolios. In this presentation we will discuss nonparametric ways to estimate the probabilities of first passage time and the corresponding expected times. Several examples will be provided.