



INSTITUTO TECNOLÓGICO AUTÓNOMO DE MÉXICO

Departamento Académico de Estadística
Río Hondo # 1, Col. Progreso Tizapán,
Ciudad de México, C.P. 01080, México

Seminario Aleatorio

Sesión 366

How to model financial data with anomalous diffusive behavior

Agnieszka Wyłomańska
Hugo Steinhaus Center for Stochastic Processes,
Faculty of Pure and Applied Mathematics,
Wrocław University of Science and Technology, Poland

Abstract

The classical financial models are based on the standard Brownian diffusion-type processes. However, in the exhibition of some real market data (like interest or exchange rates) we observe characteristic periods of constant values. Moreover, in the case of financial data, the assumption of normality is often unsatisfied. In such cases the popular Vasiček model, that is a mathematical system describing the evolution of interest rates based on the Ornstein–Uhlenbeck process, seems not to be applicable. Therefore, we propose an alternative approach based on a combination of the popular Ornstein–Uhlenbeck process with a stable distribution and subdiffusion systems that demonstrate such characteristic behavior. The probability density function of the proposed process can be described by a Fokker–Planck type equation and therefore it can be examined as an extension of the basic Ornstein–Uhlenbeck model. In this paper, we propose the parameters' estimation method and calibrate the subordinated Vasiček model to the interest rate data.

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