

CONTINUOUS TIME PROCESSES FOR FINANCE : SWITCHING, SELF- EXCITING, FRACTIONAL AND OTHER RECENT DYNAMICS

Donatien HAINAUT

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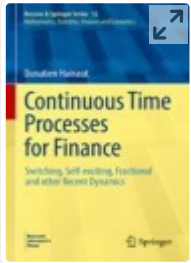
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Continuous Time Processes for Finance

Switching, Self-exciting, Fractional and other Recent Dynamics

Authors: [Donatien Hainaut](#)

Focuses on the econometric estimation of continuous time processes

Contains original content on switching, self-excited processes

Gives an exhaustive presentation of sub-diffusions

Part of the book series: [Bocconi & Springer Series](#) (BS, volume 12)

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About this book

This book explores recent topics in quantitative finance with an emphasis on applications and calibration to time-series. This last aspect is often neglected in the existing mathematical finance literature while it is crucial for risk management. The first part of this book focuses on switching regime processes that allow to model economic cycles in financial markets. After a presentation of their mathematical features and applications to stocks and interest rates, the estimation with the Hamilton filter and Markov Chain Monte-Carlo algorithm (MCMC) is detailed. A second part focuses on self-excited processes for modeling the clustering of shocks in financial markets. These processes recently receive a lot of attention from researchers and we focus here on its econometric estimation and its simulation. A chapter is dedicated to estimation of stochastic volatility models. Two chapters are dedicated to the fractional Brownian motion and Gaussian fields. After a summary of their features, we present applications for stock and interest rate modeling. Two chapters focuses on sub-diffusions that allows to replicate illiquidity in financial markets. This book targets undergraduate students who have followed a first course of stochastic finance and practitioners as quantitative analyst or actuaries working in risk management.

Keywords

Quantitative Finance Econometrics

switching processes

fractional Brownian motion

Sub-diffusions Gaussian fields

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About the author

Donatien Hainaut is professor of quantitative finance and actuarial sciences at UCLouvain where he manages the new Master program in Data Science, statistical orientation. Prior to this he held several positions as associate professor at Rennes School of Business and the ENSAE in Paris. He also has several field experiences having worked as Risk Officer, Quantitative Analyst and ALM Officer. He is a Qualified Actuary and holds a PhD in the area of Assets and Liability Management. His current research focuses on

contagion mechanism in stochastic processes,
fractional processes and their application in
insurance and finance.

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