UNIVERSITÀ CATTOLICA
del Sacro Cuore

Dipartimento di Matematica per le Scienze economiche, finanziarie ed attuariali

Nell'ambito delle iniziative seminariali del Dipartimento, rivolte alla ricerca ed alla didattica avanzata,

**lunedì 18 novembre 2024, alle ore 12.00
presso l'Aula 200 – via Necchi 9**

si svolgerà il **SEMINARIO**

« DYNAMICS AND EMPIRICS OF A STOCHASTIC BULL AND BEAR MARKET »

Speakers:
Jochen Jungeilges (University of Agder)

Tatyana Perevalova (University Pisa)

Abstract: For a financial market with heterogenous agents, we study the stochastic sensitivity of coexisting market equilibria. In particular, relying on the concept of the critical noise intensity, i.e. the largest noise variance for which transitions are still unlikely events, we devise theoretical analytical measures of stress resistance of bull and bear states. In the current project, we explore ways to provide empirical estimates of these measures. Since the critical intensities depend in a complex manner on all parameters of linear map with 5 segments augmented by noise, their estimation requires precise estimates of all model parameters. As an alternative to potential estimation strategies, e.g. ML for SETAR models or Monte-Carlo estimation techniques (MCMC), we introduce a hybrid-type procedure to estimate the parameters of a segmented regression models with unknown break-points. The operational characteristics of the estimators are demonstrated on the basis of artificial as well as on real-world capital market data.

From dynamic point of view, we analyze the existence and stability of regular regimes and describe bifurcation scenarios first in deterministic case. The parametric conditions for the border collision bifurcation, leading to the disappearance or appearance of cycles, are obtained. Due to the fact, that the map has both kinks and discontinuities, mixing of dynamic scenarios is observed (such as period adding and period incrementing). In the case of the influence of a random disturbance, we use stochastic sensitivity function technique and its associated method of confidence bands to describe noise-induced phenomena such that transitions between equilibria or cycles, intermittency, transitions between chaotic and equilibrium modes, generation of large-amplitude oscillations. We determine the critical intensity values that are necessary for the occurrence of stochastic phenomena.

Link to papers (related papers):

https://www.sciencedirect.com/science/article/pii/S0954349X20303726?via%3Dihub

https://link.springer.com/article/10.1007/s11403-020-00313-2

Link Teams per partecipazione da remoto

Tutti gli interessati sono invitati a partecipare.