de Finetti Risk Seminars

Milano Lectures on the Mathematical Theory of Economics and Finance

May 17, 2017

6 p.m. **Aula di Rappresentanza**

Erhan Bayraktar

University of Michigan

MINI-FLASH CRASHES AND MODEL MISSPECIFICATION

Abstract: Why do mini-flash crashes occur? Human errors, endogenous feedback loops, the nature of modern liquidity provision, fundamental value shocks, and market fragmentation are often implicated. We develop a model which unifies aspects of the first three explanations. Our setup seems to reproduce a number of features of recent mini-flash crashes. For example, there are circumstances in which mini-flash crashes will not occur. When they do, even just before their onset, market participants may not know with certainty whether there will be a crash or spike or that such an event is imminent at all. We appear to observe mini-flash crashes can happen in both low and high trading volume regimes as well. To the best of our knowledge, we also introduce a new paradigm for studying model misspecification risks in an optimal trading context. Our approach is based on making an explicit distinction between reality and our agents' models for reality. More precisely, each agent's model for how a certain risky asset's price will evolve is wrong in two ways: His understanding of how the price would move in his absence and how his actions affect prices are both imperfect. In fact, aside from a single trivial case, none of our agents ever know the correct price dynamics. We highlight how this framework differs from other common methods for addressing trading model misspecification risks including position limits, sensitivity analysis, Bayesian model averaging, the worst-case framework, and interpolations between the worst-case and classical setups.

Seminar: 6.00 pm
Reception: 5.30 pm

Jointly organized by
AXA Chair in Risk, Department of Decision Sciences - Bocconi University and Department of Mathematics F.Enriques - Milano University