Interface of Finance, Operations and Risk Management

Andrea Roncoroni

ESSEC Business School, Cergy-Pontoise, France
Email: roncoroni@essec.edu

Timetable: 16 hrs. First lecture on October 5th, 2023, 12:30, (date already fixed, see calendar on https://dottorato.math.unipd.it/calendar), Torre Archimede, Room 2BC30.

Course requirements: Introductory financial derivatives and arbitrage pricing theory

Examination and grading: Project work

SSD:

Aim: This course offers an introduction to the Interfaces of Finance, Operations, and Risk Management (iFORM) with a focus on Integrated Risk Management (IRM). This is a relatively new research area dealing with timely, complex, and boundary-spanning issues in a variety of commercial and industrial setups. iFORM research work addresses ways to better integrate physical, financial, and informational flows by combining the operational choices of the firm with its financial decisions and merging information flows between the firm and its customers and suppliers with informational flows between the firm and its investors. We highlight the main standing, emerging, and forthcoming contributions in IRM.

Course contents:

1. iFORM and IRM (3h)
   - A closed-loop view of operations-finance interfaces.
   - A framework for integrated risk management.
   - Risk identification, integration conditions, and operational vs. financial flexibility.
   - IRM optimization: relationship analysis and approach choice.

2. Static hedging (3h)
   - Contingent claim design: linear, piecewise linear, parametric, custom.
   - Direct hedging, cross hedging, and combined hedging.
   - Mathematical formulations of optimal custom static hedging. Operational handling integration.

3. Sample models (4h)
• The simplest IRM model with combined custom hedging.

4. Combined custom hedging (6h)
• Problem statement and solution existence and uniqueness. Examples.
• The design integral equation system.
• Corporate value assessment.
• Newsvendor IRM with combined custom hedging: solution and analysis.

Bibliography: