

Economics and
Complexity

INTEGRATING SUSTAINABILITY AND RISK MANAGEMENT

The new challenge of
risk management:
integrating the constraints
and design principles of
sustainability



*In collaboration
with*



ON LINE COURSE

19, 20, 26, 27 February
and 4 March 2024

18:00 - 19:30 PM (CET)

SUSTAINABILITY AND RISK MANAGEMENT

An ongoing challenge

Sustainability is a concept that involves almost all economic activities. The 1987 **Brundtland report Our Common Future** introduced the three pillars of sustainability:

- Environmental sustainability
- Economic and financial sustainability
- Social sustainability

ESG - Environmental, Social, and Governance - criteria are partly built on these concepts. By now, a large proportion of companies are using ESG concepts.

Despite this emphasis on sustainability, modern economies are not sustainable. In fact, we are still a long way from reaching the goals of zero CO₂ and GHG emissions while **the average temperature on the ground continues to rise.**

In addition, the consumption of non-renewable materials is constantly increasing. The **(Material Footprint)-to-GDP** ratio has remained linear for all advanced economies.

ESG and beyond: sustainability and finance

Sustainability has, and will have, a strong impact on the management of financial risks. This course looks at the practical aspects of financial risks in modern economies that are attempting to become sustainable. Classical risk models are linked to unconstrained expanding economies. This course discusses how risk models integrate with sustainability constraints and adapt to circular economies.

In this course, we discuss the **integration of ESG indices with VaR and ES based risk measurement models**. But other important aspects of sustainability such as **circularity and the evolving complex nature of modern economies** need to be integrated with quantitative risk models.

How do we calculate **correlations in a circular economy?** How does **extreme event theory apply to an economy that tends to recycle on itself?** How can network models help understand the resilience of circular economies?

These are some of the advanced topics covered in this course. In the last module, we cover risk management in a growing circular economy. The growth of a circular economy is linked to various elements, including the qualitative growth of output.

The modules of the course

1. Sustainability, February 19, 2024
 - The three pillars of sustainability
 - Sustainability is a systemic problem
 - ESG and analytical frameworks for sustainability
2. Risk Management Theory, February 20, 2024
 - Basic Risk Management Concepts
 - Market risks, credit risks and other risks
 - Models for quantitative risk measurement
3. Sustainability and VaR models, February 26, 2024
 - Financial risks related to sustainability
 - Integration of sustainability risks with VaR models
 - Estimating correlations in the circular economy
4. Sustainability and rare events, February 27, 2024
 - Extreme Value Theory
 - Integration of sustainability and ES models
 - Risk Models in the Circular Economy
5. Looking Ahead, March 4, 2024
 - Risk Models and Complexity Theory
 - Risk Models, Circularity and Qualitative Growth
 - Risk Models and Quantum Probability

The theory of risk management is based on **Quantitative Risk Management** of McNeil, Frey, Embrechts. The integration of sustainability and risk management is based on the work of Dr. Focardi.

The teacher of the course

The teacher of the course is Dr. Sergio Focardi. Author of 19 books and over one hundred articles, Dr. Focardi has a long experience in teaching and research. Focardi has taught at EDHEC in Nice, at Stony Brook University in Long Island, at the University of Princeton, at the Pole Universitaire de Vinci in Paris, at Franklin University in Lugano.

Dr Focardi's research activity is linked to the study of economies as complex evolutionary systems. In particular, Focardi and coworkers proposed a model of qualitative economic growth to describe modern economies. This model is described in the book **The Theory of Qualitative Economic Growth** coauthored by S. Focardi and F. Fabozzi.

Focardi has a degree in Electronic Engineering from the University of Genoa and a PhD in Mathematics of Finance from the University of Karlsruhe.

Practical information

The course will take place from February 19 to March 4 entirely online. There will be five sessions 19, 20, 26, 27 of February and 4 of March. Each course session lasts one and a half hours from 18:00 PM to 19:30 PM (CET).

The course includes PPT presentations and course text. Registrations of the course will be made available to participants. Course participants can send emails with questions and comments to the instructor at info@sergiofocardi.net. At the end of the course, the teacher will prepare a text with the discussion of the questions and observations.

Registration and payment forms can be found at the following address:

<https://www.sergiofocardi.net/training>

The price of the course is 200 €.

For members of CFA Societies, price is 150 €.