



# Schedule

## Winter School in Quantitative Finance 2023: Risk, Sustainability, Investments

Date and Time	Lecturer	Topic
13 January 2023, 14:00 – 14:15	Prof. Dr. Walter Farkas, University of Zurich	Welcome, Introduction, Admin Technicalities
14:15 – 18:00	Prof. Dr. Pawel Polak, Stony Brook University	Risks in Investing
14. January 2023, 09:00 – 13:00	Olivier P. Müller, CFA Society Switzerland	Quantitative Aspects of the Investment Process
20 January 2023, 14:00 – 18:00	Prof. Dr. Philipp Krüger, University of Geneva	Sustainability in Investing (integration of sustainability into investments)
21 January 2023, 09:00 – 13:00	Prof. Dr. Karl Schmedders, IMD Business School	Climate Change Regulations and Transition Risks
27 January 2023, 14:00 – 18:00	Prof. Dr. Luis Seco, University of Toronto	Risks in Alternative Investments
28 January 2023, 09:00 – 13:00	Prof. Dr. Alexander Wagner, University of Zurich	Pandemics, Geopolitics, and Financial Markets
3 February 2023, 14:00 – 18:00	Prof. Dr. Aleh Tsyvinsky, University of Yale	Digital Assets: Cryptocurrencies and NFTs
4 February 2023, 09:00 – 13:00	Prof. Dr. Ines Chaieb, University of Geneva	Global Investment Risk
10 February 2023, 14:00 – 18:00	Prof. Dr. Markus Leippold, University of Zurich	Using NLP for Analyzing Climate Disclosures and Greenwashing Detection
11 February 2023, 09:00 – 13:00	Prof. Dr. Walter Farkas, University of Zurich	Lessons learned, current challenges and a look forward



## Week 1

Friday, 13 January 2023

14:00-14:15

**Prof. Dr. Walter Farkas, University of Zurich**

Welcome, Introduction, Admin Technicalities

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14:15-18:00

**Prof. Dr. Pawel Polak, Stony Brook University, New York, USA**

Risks in Investing

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In this opening session, we will present an overview of various risks across investor types, and then we will dive into machine learning methods for risk prediction and portfolio optimization with applications for portfolio managers, low- and high-frequency traders in equities, and other asset classes. In particular, Pawel Polak will present his research on dynamic factor models and dynamic market risk estimation (with Python code) and how to incorporate exogenous information such as news effects into factor modeling. Next, he will present a new “momentum without crashes” strategy – an equity portfolio momentum strategy that exhibits high performance with a reduced drawdown compared with other momentum signals. In the second part of the lecture, we will discuss changepoints detection methods for volatility and large-scale covariance matrix estimation in low- and high-frequency data. New shrinkage covariance matrix estimators with changepoints will be introduced. We will show that accounting for changepoints further improves shrinkage covariance matrix estimators portfolio performance.

Saturday, 14. January 2023

09:00-13:00

**Olivier P. Müller, CFA Society Switzerland**

Quantitative Aspects of the Investment Process

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In the first part, we will give an introduction to the institutional investment process, with special consideration of various return and risk factors, both in theory and practice. We will also discuss some quantitative aspects in developing a strategic asset allocation and the process to take tactical views. In the second part, we will mostly look at the implementation of investment strategies in both single-asset class and multiple-asset class contexts, especially through the quantitative lens. We will have a particular look at instrument selection, be it of single instruments but also collective instruments. There, we will be looking both at theoretical and practical aspects and will be discussing quantitative elements of the selection process in particular.



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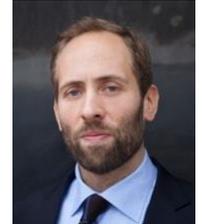
## Week 2

Friday, 20 January 2023

14:00-18:00

**Prof. Dr. Philipp Krüger, University of Geneva**

Sustainability in Investing (integration of sustainability into investments)



The goals of this Sustainability in Investing lecture are: to become familiar with basic sustainable investing concepts and different implementation approaches; to understand the risk/return implications of sustainable investing as well as to discuss shortcomings/challenges relating to currently available sustainable investing data and implementation approaches.

Saturday, 21 January 2023

09:00-13:00

**Prof. Dr. Karl Schmedders, IMD Business School, Lausanne**

Climate Change Regulations and Transition Risks



The recent IPCC (Intergovernmental Panel on Climate Change) report predicts that the goals of the 2015 Paris Agreement to limit global warming to 2°C or even 1.5°C will not be reached. Instead, the authors of that study now forecast an increase of average global temperatures of about 3°C. These unfortunate news will likely lead to additional regulations of human economic activities in many countries. In this lecture, we will first review the economic rationale for such regulations. Next, we will discuss the current state of global carbon pricing initiatives. And finally, we will examine related private initiatives. Climate mitigation policies will likely create new low-carbon value chains (“sunrise” industries) and simultaneously put huge pressure on old carbon-intensive industries and occupations (“sunset” industries). Ill-designed policies can cause substantial repricing of assets—including the outright stranding of assets—and economic uncertainty, raising the risks of financial stability and social unrest. We will examine the transition risks for businesses, households, and investors. In addition, we will discuss opportunities for companies facing the green transition.



## Week 3

Friday, 27 January 2023

14:00-18:00

**Prof. Dr. Luis Seco, University of Toronto, Canada**

Risks in Alternative Investments



Investing is the action of converting risk into return. In order to understand the investment process, we need a risk perspective. This lecture will explain how investments are constructed, introduce the different trading strategies and how investment products are constructed. We will explain equity trading, convertible arbitrage, macro strategies, credit and futures. Alternative investments give rise to the most complex considerations, and we will focus mainly on those. We will discuss hedge funds, guaranteed notes and leveraged investments, amongst others.

Saturday, 28 January 2023

09:00-13:00

**Prof. Dr. Alexander Wagner, University of Zurich**

Pandemics, Geopolitics, and Financial Markets



The last three years have seen two highly unexpected events: a pandemic and the emergence of war in Europe. This session will review what we have learned about how asset markets have reacted to the realization of these arguably neglected risks, and how investors can better prepare for the future. Which companies are more resilient and why? Which investors have contributed to the stabilization of markets, and which have rather engaged in fire sales? Which asset classes have responded how and why? How can one ex ante measure geopolitical risks, for example, through textual analysis? What about the insurability of pandemic risks?



## Week 4

Friday, 3 February 2023

14:00-18:00

**Prof. Dr. Aleh Tsyvinsky, University of Yale, USA**

Digital Assets: Cryptocurrencies and NFTs



Cryptocurrencies and the NFTs will be considered as an asset class. We will discuss key driving forces of the behavior of the returns of these assets over time and the returns in the cross-sections of individual coins and NFTs. We also will discuss the models of what may determine value and behavior of these assets.

Saturday, 4 February 2023

09:00-13:00

**Prof. Dr. Ines Chaieb, University of Geneva**

Global Investment Risk



The objective of this lecture is to understand investment risk in global asset allocation and acquire skills to implement risk management tools. As globalization is a major trend affecting the asset management industry, we will discuss international diversification of portfolios. How to diversify: Country vs industry? Traditional asset management focuses on equities and fixed income. In this lecture, we will also discuss currencies as an asset class and explore carry trade strategies. We will also study different currency hedging strategies for a global equity portfolio and examine how hedging currency risk affects the return and risk of foreign investment. (Python codes that implement carry trade strategies and currency hedging will be provided).



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## Week 5

Friday, 10 February 2023

14:00-18:00

**Prof. Dr. Markus Leippold, University of Zurich**

Using NLP for Analyzing Climate Disclosures and Greenwashing Detection



The goals of the lecture are to get familiar with basic concepts from Natural Language Processing, diving into some of new possibilities with deep-learning based NLP methods, a short intro to ClimateBERT, potential applications and textual analysis of corporate climate-risk disclosure, providing insights on what needs to be done for moving towards AI-based Greenwashing Detection.

Saturday, 11 February 2023

09:00-13:00

**Prof. Dr. Walter Farkas, University of Zurich**

Lessons learned, current challenges and a look forward



The aim of the final lecture is twofold: on the one hand we want to summarize the lessons learned from the previous sessions and, on the other hand, we want to address the key current challenges in these broad areas. It will also include a guest talk of Rachel Whittaker, Head of Sustainable Investing at Robeco, on Robeco's current challenges, as well as input talks from further 2-3 leading practitioners.