International Workshop on Sustainable Finance and Related Issues

July 6, 2024 (Sat) 9:30–17:30
July 7, 2024 (Sun) 10:00–16:30

Hotel Oacity Kyowa in Miyakojima, Okinawa, Japan

Speakers

Takanori Adachi	Tokyo Metropolitan University
Hiroshi Ishijima	Chuo University
Rusudan Kevkhishvili	Kyoto University
Katsushi Nakajima	Ritsumeikan Asia Pacific University
Tomonori Nakatsu	Shibaura Institute of Technology
Makoto Shimoshimizu	Tokyo University of Science
Yong Hyun Shin	Sookmyung Women's University
Ester Trutwin	University of Zurich and Swiss Finance Institute

Scientific Committee

Takanori Adachi	Tokyo Metropolitan University
Chiaki Hara	Kyoto University
Tomonori Uchiyama	Tokyo Metropolitan University
Kyoko Yagi	Tokyo Metropolitan University

Organized by Institute of Economic Research, Kyoto University,
Research Center for Quantitative Finance, Tokyo Metropolitan University.

July 6 (Sat)

9:30–9:45	Opening address by Tomonori Uchiyama, Director of Research Center for Quantitative Finance, Tokyo Metropolitan University
Session 1	Chair: Kohta Takehara, Tokyo Metropplotan University
9:45–10:30	Hiroshi Ishijima Chuo University "A Note on ESG CAPM and Factor Models"
10:30–11:15	Ester Trutwin University of Zurich and Swiss Finance Institute "Modelling Sustainable Investing in the CAPM"
11:15–12:00	Takanori Adachi Tokyo Metropolitan University "Time Series Data Generation by Linear Response Model"
Session 2	Chair: Teruyoshi Suzuki, Hokkaido University
13:30–14:15	Yong Hyun Shin Sookmyung Women's University "Living Standard and Psychological-Wealth-Based Optimal Consumption and Investment Policies"
14:15–15:00	Katsushi Nakajima Ritsumeikan Asia Pacific University "Equilibrium with Heterogeneous Information and Beliefs"
Session 3	Chair: Tomooki Yuasa, Tokyo Metropolitan University
15:15–16:00	Makoto Shimoshimizu Tokyo University of Science "Brokerage Commissions in an Uncertain Stock Market"
16:00–16:45	Rusudan Kevkhishvili Kyoto University "Post-Last Exit Time Process and its Application to Loss-Given-Default Distribution"
16:45–17:30	Tomonori Nakatsu Shibaura Institute of Technology "Computation of Greeks for Barrier Options in Some Diffusion Models"

July 7 (Sun)

10:00–16:30	Reports and discussions on recent developments on the sustainable finance
16:30–16:45	Closing address by Kyoko Yagi, Tokyo Metropolitan University

July 6, 9:45–10:30

A Note on ESG CAPM and Factor Models

Hiroshi Ishijima

The Chuo Law School, Chuo University

Global efforts to achieve net-zero carbon emissions by 2050 and mitigate climate change are intensively driven by capital market functions, including ESG investing. In this context, we are developing several versions of asset pricing models for ESG investing. Our models represent an important concept called the "double bottom line" for ESG investing. Therefore, this study serves as a foundation for empirical research to show whether or not ESG investing allows us to achieve a double bottom line.

July 6, 10:30–11:15

Modelling Sustainable Investing in the CAPM

Ester Trutwin

University of Zurich and Swiss Finance Institute

Empirical studies investigate various causes and effects of sustainable investments. While some attempts have been made to describe the results found by theoretical models, these are relatively complex and heterogeneous. We relate to existing studies and use a parsimonious Capital Asset Pricing Model (CAPM) in which we model different aspects of sustainable investing. The basic reasoning of the CAPM, that investors need to be compensated for the bad aspects of assets applies so that investors demand higher returns for investments that are harmful from an environmental, social, and governance (ESG) perspective. Moreover, if investors have heterogeneous views on the ESG–characteristics of a company, the market requires higher returns for that company, provided richer investors care more about ESG than poorer investors, which is known as the Environmental Kuznets Curve (EKC). Besides the effect on asset prices, we find that sustainable investing has an impact on a firm ' s production decision through two channels – the growth and the reform channel. Sustainable investment reduces the size of dirty firms through the growth channel and makes firms cleaner through the reform channel. We illustrate the magnitude of these effects with numerical examples calibrated to real–world data, providing a clear indication of the high economic relevance of the effects.

July 6, 11:15–12:00

Time Series Data Generation by Linear Response Model

Takanori Adachi

Tokyo Metropolitan University

We propose a new method for generating virtual time series data based on linear response theory (LRT). Using the LRT, we can obtain an approximate representation of the transition from the current equilibrium state to another equilibrium state by adding second-order fluctuation in the current equilibrium state and external forces (stresses). In other words, if the external force can be estimated in advance, we shall be able to obtain virtual time series data under external forces. As an application, we examined whether this method is effective with data augmentation of the stock prediction model using external forces estimated by historical data. As a result, the accuracy of stock price predictions was improved over the case without data augmentation.

July 6, 13:30–14:15

Living Standard and Psychological-Wealth-Based Optimal Consumption and Investment Policies

Yong Hyun Shin

Sookmyung Women's University

We study optimal, dynamic consumption and portfolio policies of utility maximizing agents who must maintain a living standard. We show that maintaining the minimum standard of living allows agents to endogenize a certain wealth threshold, which we call psychological wealth, below which they optimally choose to consume nothing. Psychological-wealth-based (PWB) agents then find it optimal to increase consumption significantly once they accumulate assets above psychological wealth. The PWB model, thus, better matches empirical marginal propensities to consume numbers. Interestingly, psychological wealth tends to reduce agents' effective risk aversion, thus increasing their risk taking on the stock market.

July 6, 14:15–15:00

Equilibrium with Heterogeneous Information and Beliefs

Katsushi Nakajima

Ritsumeikan Asia Pacific University

This paper proposes a general equilibrium model which assumes agents with heterogeneous information and beliefs. We introduce agents whose event-trees are different from each other. The classical general equilibrium is defined. We then show the condition for the general equilibrium to exist.

July 6, 15:15–16:00

Brokerage Commissions in an Uncertain Stock Market

Makoto Shimoshimizu

Tokyo University of Science

This study theoretically and empirically investigates how Knightian uncertainty about stock returns influences brokerage commissions via investors' stock demand. We model a stock market wherein oligopolistic brokers mediate financial transactions among uncertainty-averse investors. We find that a deterioration of fundamentals about stock returns reduces the equilibrium commission, whereas an increased uncertainty raises it. Based on panel data for Canada, Japan, the United Kingdom, and the United States from 2010:Q4 to 2021:Q4, we present empirical results that support our theoretical findings.

July 6, 16:00–16:45

Post-Last Exit Time Process and its Application to Loss-Given-Default Distribution

Masahiko Egami and Rusudan Kevkhishvili

Kyoto University

We study a linear diffusion process after its last exit time from a certain regular point. Rather than treating the process as newly born at the last exit time, we view the whole path and separate the original process before and after the last exit time. This enables us not only to identify the transition semigroup, boundary behavior, entrance law, and reverse of the post-last exit time process, but also to establish a financial model for estimating the loss-given-default distribution of corporate debt (an all-time important open problem).

July 6, 16:45–17:30

Computation of Greeks for Barrier Options in Some Diffusion Models

Tomonori Nakatsu

Shibaura Institute of Technology

In this talk, we obtain formulas to compute the Greeks for barrier options. In particular, we generalize the results in Gobet and Kohatsu-Higa (Electron. Comm. Probab., 2003) and Nakatsu (J. Comput. Finance, 2017). Some numerical results will also be shown.