



哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY

CONFERENCE
ON
ECONOMIC THEORY



Program

Institute for Advanced Study in Mathematics
August 21–23, 2023





Conference on Economic Theory

The "Economic Theory Conference" will be held on August 21-23, 2023 at Harbin Institute of Technology. The conference will invite famous economists, leading scholars and young talents to discuss the frontiers of economic theory, econometrics and finance, to promote academic exchanges and interdisciplinary research. The conference is hosted by Harbin Institute of Technology and organized by the Institute of Mathematics.

Academic Committee:

Robert Anderson University of California, Berkeley
Songnian Chen Zhejiang University
Soohong Chew National University of Singapore/SWUFE
Yongmiao Hong University of Chinese Academy of Science

Local Organizing Committee:

Haosui Duanmu Harbin Institute of Technology
Xiao Xiong Harbin Institute of Technology
Quanhua Xu Harbin Institute of Technology

Participants:

Robert Anderson	University of California, Berkeley
Songnian Chen	Zhejiang University
SooHong Chew	National University of Singapore/SWUFE
Haosui Duanmu	Harbin Institute of Technology
Wei He	Chinese University of Hongkong
Yongmiao Hong	University of Chinese Academy of Science
Motonobu Kanagawa	European College of Communication
Wenqian Wang	Southwestern University of Finance and Economics
Jieran Wu	Zhejiang University
Fangyuan Zhang	EDHEC Business School
Yongchao Zhang	Shanghai University of Finance and Economics
Junjie Zhou	Tsinghua University

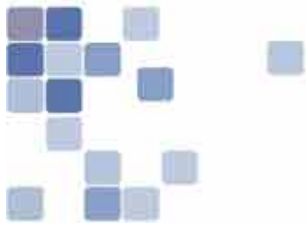
Contact: Haosui Duanmu

Email: duanmuhaosui@hotmail.edu

Phone: 0451-86413107

Location: Room 201-1, Ming De Building, Harbin Institute of Technology





Conference Schedule

2023.8.22 Morning

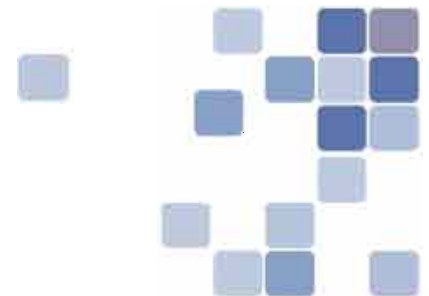
09:00-09:15	Opening Remark (Quanhua Xu, Yongmiao Hong)	
Session Chair: Soohong Chew		
09:30-10:20	Songnian Chen	Quantile Regression for Duration data with time-varying regressors
10:20-11:10	Junjie Zhou	Interconnected Conflict
Session Chair	Session Chair: Junjie Zhou	
11:30-12:20	Haosui Duanmu	General Equilibrium Theory and Climate Change

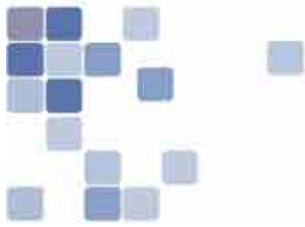
2023.8.22 Afternoon

Session Chair: Songnian Chen		
14:00-14:50	Yongmiao Hong	Time-varying Factor Selection: A Sparse Fused GMM Approach
14:50-15:40	Jieran Wu	TBA
Session Chair	Session Chair: Robert Anderson	
16:00-16:50	Soohong Chew	A Rich Mixture Set, Process Preferences, and Home Bias
16:50-17:40	Wenqian Wang	Reorganizing Operations on Game Forms

2022.8.23 Morning

Session Chair: Haosui Duanmu		
09:00-09:50	Wei He	Bayesian Persuasion with Sequential Private Information
09:50-10:40	Yongchao Zhang	On Competitive Equilibria Housing Market with One Broker
Session Chair	Session Chair: Yongmiao Hong	
10:50-11:40	Fangyuan Zhang	Non-concave Portfolio Optimization under Risk Measures
11:40-12:30	Motonobu anagawa	Counterfactual Mean Embeddings
12:30-12:35	Robert Anderson	Closing Remark





Talk Abstract

Quantile Regression for Duration data with time-varying regressors

Songnian Chen

Zhejiang University

Common duration models are characterized by strong homogeneity and thus are highly restrictive in allowing for how regressors affect the conditional duration distribution. In particular, the implied sign and relative marginal quantile effects remain the same over the entire range of the conditional duration distribution, which rules out general heterogeneous effects in duration data. Quantile regression, which offers a flexible and unified framework that allows for general heterogeneous effects, is particularly well suited to duration analysis. Based on the insights behind the accelerated failure time model (AFT) with time-varying regressors (Cox and Oakes, 1984) and the standard quantile regression model (Koenker and Bassett, 1978), we propose a quantile regression framework with time-varying regressors. Furthermore we propose an easy-to-implement quantile regression estimation. The proposed estimator is shown to be consistent and asymptotically normal, and performs well in finite samples.

A Rich Mixture Set, Process Preferences, and Home Bias

SooHong Chew

National University of Singapore/SWUFE

Decision making often involves compounding of risks from different sources. Building on the Herstein-Milnor mixture set axiomatization of expected utility theory, we employ multiple mixture operators each modeling a source of risk to arrive at the definition of a rich mixture set, elements of which are rich lotteries. Our modeling framework enables a source-dependent weakening of the independence axiom as well as the reduction of compound lottery axiom. This yields a representation for preference over rich lotteries called source recursive expected utility (SREU). When there is consistent preference for the “same” lottery arising from different sources, SREU implies a preference for risk being resolved more decisively by the preferred source. We further show that an SREU investor always exhibits home bias when she consistently prefers risks arising from the domestic stock market over identically distributed risks from the foreign stock market.

General Equilibrium Theory and Climate Change

Haosui Duanmu

Harbin Institute of Technology

We propose two general equilibrium (GE) models---quota equilibrium and emission tax equilibrium---that incorporate the regulatory schemes used in practice to control greenhouse gas emissions. In these models, the government first specifies quotas or taxes on emissions, then refrains from further action. We show the existence of a quota equilibrium. In a quota equilibrium, the allocation of emission property rights has a major effect on the distribution of welfare among consumers. Assuming that the only externality arises from the total net pollution emission, the quota equilibrium consumption-production plan is Pareto Optimal among all feasible consumption-production plans with the same total net emissions. We show that every quota equilibrium can be realized as an emission tax equilibrium and vice versa. However, for certain tax rates, there may be no corresponding emission tax equilibrium. Full Pareto optimality of quota equilibrium can often be achieved by setting the right quota, and, in some cases, full Pareto optimality of emission tax equilibrium can be achieved by setting the right tax rate. Computable General Equilibrium (CGE) methods allow the effective computation of our equilibrium notions in applied macroeconomic models.

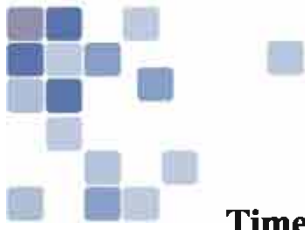
Bayesian Persuasion with Sequential Private Information

Wei He

Chinese University of Hongkong

We study a Bayesian persuasion problem where an agent learns private information gradually in two stages. We find that the optimal persuasion scheme may offer different experiments to different types of agents. This finding contrasts with the optimality of public persuasion in scenarios where the agent's private information is static. We identify sufficient conditions that allow the information designer to strictly improve upon public persuasion, as well as conditions where public persuasion remains optimal. Our results demonstrate that time can be utilized as an instrument to achieve information discrimination.





Time-varying Factor Selection: A Sparse Fused GMM Approach

Yongmiao Hong

University of Chinese Academy of Science

Empirical asset pricing studies evaluate and select risk factors solely based on their historical aggregate performance, implicitly assuming a time-invariant model specification, and overlooking potential time variations of specification in the stochastic discount factor (SDF) model. This paper presents a new method for capturing the time-varying sparsity of factor models by identifying heterogeneous structural breaks instrumented by macroeconomic regimes. Our empirical findings highlight that factor model specification changes over time. We identify time-invariant factors, such as **REG** and **STR**, as well as time-varying factors, such as **IMD**, **BAB**, and **IVOL**, selected in different periods in response to macroeconomic-targeted regime switching.

Counterfactual Mean Embeddings

Motonobu Kanagawa

European College of Communication

Counterfactual inference has become a ubiquitous tool in online advertisement, recommendation systems, medical diagnosis, and econometrics. Accurate modelling of outcome distributions associated with different interventions---known as counterfactual distributions---is crucial for the success of these applications. In this work, we propose to model counterfactual distributions using a novel Hilbert space representation called counterfactual mean embedding (CME). The CME embeds the associated counterfactual distribution into a reproducing kernel Hilbert space (RKHS) endowed with a positive definite kernel, which allows us to perform causal inference over the entire landscape of the counterfactual distribution. Based on this representation, we propose a distributional treatment effect (DTE) which can quantify the causal effect over entire outcome distributions. Our approach is nonparametric as the CME can be estimated under the unconfoundedness assumption from observational data without requiring any parametric assumption about the underlying distributions. We also establish a rate of convergence of the proposed estimator which depends on the smoothness of the conditional mean and the Radon-Nikodym derivative of the underlying marginal distributions. Furthermore, our framework allows for more complex outcomes such as images, sequences, and graphs. Our experimental results on synthetic data and off-policy evaluation tasks demonstrate the advantages of the proposed estimator.

Reorganizing Operations on Game Forms

Wenqian Wang

Southwestern University of Finance and Economics

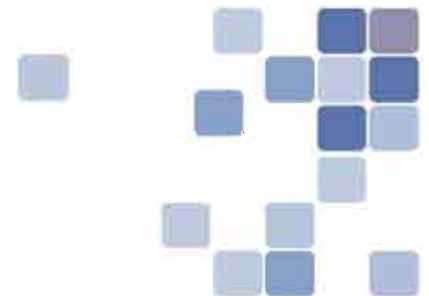
I reorganize the operations on game forms. I discern two types of the Adding operation (**a.k.a., addition of superfluous moves**) as modified by **Elems and Reny (1992)**. I generalize the Coalescing operation (**a.k.a., Coalescing Moves**) into the Conflating operation. Last, I introduce the Pruning operation. I can offer an information-flow interpretation to each of the operations mentioned in the study. This reorganization brings about several merits. It offers a new characterization of normal-form equivalence based on the Conflating operation, dispensing with either type of the Adding operation. Furthermore, the difference between the Coalescing operation and the Conflating operation offers an underpinning for the invariance of solutions on equivalent game forms and helps to define two types of simplification relation between game forms. These two types of simplification relation parallel with the two types of equivalence relation studied in **Battigalli, et al., (2020)**.

Non-concave Portfolio Optimization under Risk Measures

Fangyuan Zhang

EDHEC Business School

Value-at-Risk (**VaR**) and Expected Shortfall (**ES**) are popular risk measures within the financial regulation of banking and insurance institutions. In this talk, we explore the optimal asset allocation strategies that a financial company might adopt when facing these risk constraints. The assumption herein is that the financial institution maximizes the utility of its surplus, or the positive difference between its asset and its liability. This assumption turns the optimization problem into a non-concave one. We consider four unique risk constraints and tackle the optimization problem by piece-wise Lagrangian and quantile formulation approach. Our findings are the following: 1) In the non-concave setting, the four risk constraints lead to the same optimal solution. This is different to the findings in the concave setting; 2) The risk constraints can reduce the default probability of the financial company but cannot prevent default in the worst financial scenarios; 3) If the company has a low initial budget, the risk regulation provides a poor protection for the company's liability holders.





On Competitive Equilibria Housing Market with One Broker

Yongchao Zhang

Shanghai University of Finance and Economics

Housing market (**Shapley and Scarf, 1974**) is a classic model in market design, and there exists a unique competitive equilibrium allocation, the outcome of the top trading cycles mechanism. We in this paper propose a notion of competitive equilibrium in a model of housing market with one broker; here a broker can only trade her brokered house with others, but she cannot take it and leave the market (**Pycia and Unver, 2017**). We find that there is also a unique competitive equilibrium allocation in our model, and this allocation is the outcome of trading cycles mechanism.

Interconnected Conflict

Junjie Zhou

Tsinghua University

This paper presents a model of conflict in which players compete in multiple interconnected battlefields. We investigate the impact of network topology on players' effort allocation and the resulting aggregate efforts in equilibrium. Surprisingly, we find that network topology does not significantly affect aggregate efforts, despite shaping players' effort allocation across battlefields. We also show that players' winning probabilities and equilibrium payoffs remain constant as network topology varies, even when players may exert zero efforts at certain battlefields due to spillovers from active nearby battlefields. Our results suggest that the network structure of the conflict may influence strategic behavior, but does not necessarily affect the overall outcome of the conflict. We discuss the robustness of these network-neutral findings in several model extensions.