ECON7153: EMPIRICAL GAME THEORY ANALYSIS

Spring 2024
National Taiwan University

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Office Hours	via Calendly (see below)
Time	Wednesday 3, 4 (10:10 AM – 12:10 PM)
Venue	Rm 607, Social Science Building

Description This course aims to introduce recent developments in estimating a discrete model of oligopolistic interactions using real-world data, primarily focusing on dynamic settings. We will begin by covering the required numerical methods for analyzing a game-theoretical model. Our initial focus will be on understanding non-linear equations, numerical optimization, and numerical integrations. Moving forward, we will briefly explore the static entry model, an exemplary textbook framework that serves as an introduction to empirical game-theoretical models. Before directly diving into the dynamics of interactions among long-lived firms in oligopolistic settings, we will touch on a single-agent dynamic discrete decision-making process as background. With a clear understanding of a single-agent dynamic discrete choice model, we will extend this model into a dynamic oligopoly framework and proceed to explore the methodologies of mapping this framework to real-world data.

Office Hours I plan to hold my office hours from 2 PM to 4 PM on Wednesday. You must reserve a 20-minute appointment slot through Calendly (`https://calendly.com/joonkyo/econ7153`) in advance to attend office hours. This process will help us streamline operations and prevent wasteful timeslots. I will not accommodate any walk-in visits without a prior reservation.

Textbook and Reference There is no formal textbook for this course. The reading list will be posted on NTU COOL soon.

Prerequisite All students are expected to have basic understanding of graduate-level microeconomics and econometrics along with undergraduate-level game theory. Homework assignments will request numerical solutions to given games and the estimation of the models using provided datasets. I thus expect all students to have intermediate-level knowledge of MATLAB and STATA (or equivalent programs).

Grading Policy Four components determine your grade: Attendance, in-class presentation, Homework assignments and take-home exam. The relative weights are as follows:

Attendance 20%

In-class Presentation 20%
Two presentations, each accounting for 10%.

Homework 30%
Two homework assignments, each accounting for 15%.

Take-home Exam 30%

In-class Presentation Students are expected to present well-published papers from the reading list twice throughout this semester. Presentation times range from 20 to 30 minutes. Students can freely choose which paper they wish to present. The selections are first come, first-served basis. During their presentations, students should emphasize the following aspects of a paper:

1. Research question
2. Empirical approach
3. Key empirical findings
4. Contribution

Course Outline

The schedule below is tentative. Any unexpected changes to the schedule will be announced in-class (as the course proceeds).

Digression - Nonlinear equation, Numerical optimization, Numerical Integration .....

Static Entry Game I - Complete Information .....

Static Entry Game II - Incomplete Information .....

Assignment 1 .....

Single-Agent Dynamic Discrete Choice Model I - Ingredients .....

Single-Agent Dynamic Discrete Choice Model II - Estimation Strategies .....

Single-Agent Dynamic Discrete Choice Model III - Empirical Applications .....

Assignment 2 .....

Dynamic Discrete Games I - Ingredients .....

Dynamic Discrete Games II - Numerical Solutions .....

Dynamic Discrete Games III - Estimation Strategies .....

Dynamic Discrete Games IV - Empirical Applications .....

Dynamic Discrete Games V - Remaining Issues in Literature (if time allowed) .....

Take-Home Exam .....May 29, 2023 – June 5, 2023