

**THE UNIVERSITY OF HONG KONG
FACULTY OF BUSINESS AND ECONOMICS**

PhD Course Syllabus

Course Code/Title: [ECON6806] Topics in Empirical Industrial Organisation

Course Description: This PhD class covers selected topics in Empirical Industrial Organization. We will focus on topics related to firm heterogeneity, endogenous decisions, market competition, and the resulting industry dynamics. We will cover firm production analysis, demand analysis, innovation, market structure, and industry dynamic equilibrium. Besides the classical literature, we will also discuss market friction and the recent development of relevant topics. We will use both the reduced-form analysis and structural approach in Empirical IO in this course.

Course Objectives: This course is specifically designed for Ph.D. students in their first and second years of study, as well as top M.A. students who are interested in Empirical Industrial Organization. The course will provide an extensive range of methodological and empirical approaches for conducting research in Empirical Industrial Organization. The objectives of the course include:

- Provide students with an extensive review of the classical literature in Empirical Industrial Organization.
- Guide the students to understand the cutting-edge research in the field, understanding the gap in the literature, and identify potential research topics
- Provide students with various research methodologies including both reduced-form and structural analysis widely used in Empirical Industrial Organization.
- Familiarize the students with basic skills in numerical research and coding.

The course eventually aims to prepare the students with knowledge in Empirical IO literature and theoretical and empirical skills to conduct research in the field.

Pre-requisite: None

Assessment: 100% coursework

Remarks: All PhD courses are non-credit-bearing and will be assessed on a letter grade basis.

Course Learning Outcomes (CLOs) On completion of this course, students should be able to:	Aligned PLOs*				
	1	2	3	4	5
1. Understand the basic set of questions addressed in the field of Industrial Organization	X		X		X
2. Understand the conceptual framework commonly adopted to address these questions	X	X		X	X
3. Understand the basic empirical tools and modern quantitative approaches to address these questions	X	X	X		X
4. Get familiar with the literature in the relevant field	X	X	X	X	X
5. Be equipped with the tools to do their independent research	X	X	X	X	

***Programme Learning Outcomes (PLOs) for Research Postgraduate Programme:**

1. Demonstrate critical understanding, at an advanced level, of up-to-date knowledge and research methodology of a particular field
2. Implement effective academic and personal strategies for carrying out research projects independently and ethically
3. Contribute original knowledge in response to issues in their specialist area
4. Communicate research findings at a diverse range of levels and through a variety of media
5. Evaluate one's own research in relation to important and latest issues in the field

COURSE DETAILS (*subject to change at instructor's discretion*)

Year/Semester: 2026-27, First Semester

Time/Venue: Wednesday 9:00 - 11:50 (TBA)
 Sep 2, 9, 16, 23;
 Oct 7, 21:
 Nov 4, 11, 18, 25

Instructor: **Prof. ZHANG Hongsong**
 Email: hszhang@hku.hk
 Office: KK906 (by appointment)

I. Teaching and Learning Activities

In-class and Out-of-class Activities (<i>e.g. lectures, class discussion, papers reading, proposal writing</i>)	Expected hour	% of student study effort
TLA1. (Lecture and class discussion)	36	24%
TLA2. (Paper reading)	45	30%
TLA3. (Consultation)	9	6%
TLA4. (In-class presentation, assignment and application)	60	40%
Total	150	100%

II. Assessment

Assessment Components (<i>e.g. assignments, proposal, presentation, examination</i>)	Weight	CLOs to be assessed				
		1	2	3	4	5
1. One referee report	20%					
2. One in-class presentation	20%					
3. In-class participation	10%					
4. One research proposal	50%					
Total	100%					

Students will be assessed based on the following performance standards:

Course Grade	Performance Standard
A+, A, A-	Outstanding performance; demonstrates comprehensive understanding, critical thinking, and originality.
B+, B, B-	Good performance; shows solid understanding and application of key concepts, with some minor errors or omissions.
C+, C, C-	Satisfactory performance; basic understanding is evident, but with notable gaps or inconsistencies.
D+, D	Marginal performance; minimal understanding, with significant errors or misunderstandings.
F	Failing performance; little or no understanding of key concepts.

Assessment Component 1 *(Optional)*

Score	Performance Standard

Assessment Component 2 *(Optional)*

Score	Performance Standard

Assessment Component 3 *(Optional)*

Score	Performance Standard

Assessment Component 4 *(Optional)*

Score	Performance Standard

III. Course Content and Tentative Schedule

Topic 1 (week 1): An Introduction to Empirical Methods in Empirical IO

1. Kenneth L. Judd, "Numerical Methods in Economics"

Topic 2 (week 2-3): Understanding Productivity in IO and International Trade

1. Blundell, R. and Bond, S., "GMM Estimation with Persistent Panel Data: An Application to Production Functions", *Econometric Reviews*
2. *Olley, S. and Pakes, A., "The Dynamics of Productivity in the Telecommunications Equipment Industry", *Econometrica*, 64 (6), 1996, 1263-1297
3. Akerberg, D., Caves, K. and Frazer, G., "Identification Properties of Recent Production Function Estimators", *Econometrica*, November 2015, Vol.83(6), pp.2411-2451.
4. Gandhi A., Navarro S., Rivers D., "On the Identification of Gross Output Production Functions", *JPE*
5. (The problems?) Chad Syverson (2011), "What Determines Productivity?" *Journal of Economic Literature*, Vol. 49, No. 2, June 2011, pp. 326-65.
6. *(Output prices) Lucia Foster, John Haltiwanger and Chad Syverson (2008), "Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?" *American Economic Review*, Vol. 98, No. 1 (Mar., 2008), pp. 394-425.
7. (Demand factor) Marc J. Melitz (2000), "Estimating Firm-Level Productivity in Differentiated Product Industries", working paper.
8. Andrea Pozzi and Fabiano Schivardi, "Demand or productivity: what determines firm growth?", *RAND*, 2016.
9. (Output quality) Jing Li, Shengyu Li, and Hongsong Zhang, "Output Quality, Productivity Growth, and Resource Reallocation", with Jing Li and Shengyu Li, March 2022.
10. *(Supplier network) Paul Grieco, Shengyu Li, and Hongsong Zhang (2016), "Production Function Estimation with Unobserved Input Price Dispersion", *International Economic Review*, Vol 57, Issue 2, page 665-690, May 2016.
11. (Non-Hicks Neutral Technology) Ulrich Doraszelski and Jordi Jaumandreu (2018), "Measuring the Bias of Technological Change", *Journal of Political Economy*, 126 (3), pp. 1027-1084.
12. Devesh Raval, "The Micro Elasticity of Substitution and Non Neutral Technology", *RAND Journal of Economics* (Spring 2019), 50 (1), 147-167
13. *Hongsong Zhang (2019), "Non-Neutral Technology, Firm Heterogeneity, and Labor Demand", *Journal of Development Economics*, Vol 140, Pages 145-168, September 2019.

Topic 3 (week 4-5): Demand Analysis and Market Power

1. *Logit and limitations, Hedonic (attribute space demand), product space demand--- Instead of a specific-topic paper, add a review paper instead
2. (AIDS model) Deaton and Muellbauer, "An Almost Ideal Demand System", *The American Economic Review*, Vol. 70, No. 3 (Jun., 1980), pp. 312-326.

3. Timothy F. Bresnahan, "Competition and Collusion in the American Automobile Industry: The 1955 Price War", *The Journal of Industrial Economics*, Vol. 35, No. 4, Jun., 1987, pp. 457-482.
4. *S. Berry (1994), "Estimating Discrete-Choice Models of Product Differentiation", *RAND*, Vol. 25, No. 2 (Summer, 1994), pp. 242-262.
5. *Berry, S., J. Levinsohn and A. Pakes (1995): "Automobile Prices in Market Equilibrium," *Econometrica*, 60(4), 889-917.
6. *Nevo, A. (2001): "Measuring Market Power in the Ready-to-Eat Cereal Industry," *Econometrica*, 69(2), 307-342.
7. "Semi-Nonparametric Estimation of Random Coefficient Logit Model for Aggregate Demand," *R&R at Journal of Econometrics* (with Zhentong Lu, Xiaoxia Shi, and Jing Tao)
8. *Production Approach: De-Loecker-Warzynski Method;
9. *Steve Bond, Arshia Hashemi, Greg Kaplan, Piotr Zoch, "Some unpleasant markup arithmetic: Production function elasticities and their estimation from production data", *JME*, Volume 121, Pages 1-180 (July 2021)
10. Devesh Raval, "Testing the Production Approach to Markup Estimation", *Revise and Resubmit, Review of Economic Studies*.
11. *Paul L. E. Grieco, Charles Murry, Ali Yurukoglu, "Evolution of Market Power in the US Auto Industry", 2021 working paper.
12. Nevo, A. (2011): "Empirical Models of Consumer Behavior," *Annual Review of Economics*, 3, 51-75.

Topic 4 (week 6-7): Endogenous Decisions of Firms

1. Thompson, P., "Learning by Doing" (*Handbook of the Economics of Innovation*)
2. *(Single-Agent Dynamic Choice) Rust, J. (1987). Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher. *Econometrica*, 55(5), 999.

Import & Export Decisions and Effects:

3. *Aw, Roberts, & Xu, "R&D, Exporting, and Productivity Dynamics", *AER*, 2011
4. Mary Amiti and Jozef Konings, "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia", *American Economic Review*, Vol. 97, No. 5 (Dec., 2007), pp. 1611-1638.
5. Paul Grieco, Shengyu Li, and Hongsong Zhang (2022), "Input Prices, Productivity, and Trade Dynamics: Long-Run Effects of Liberalization on Chinese Paint Manufacturers", *RAND Journal of Economics*, forthcoming.

R&D and Innovation Decisions:

6. General review
7. Peters et al, "Estimating Dynamic R&D Choice: An Analysis of Costs and Long-Run Benefits", *RAND*.
8. *Z. Chen, Z. Liu, J.C. Suarez-Serrato, D.Y. Xu, "Notching R&D Investment with Corporate Income Tax Cuts in China", *American Economic Review*, July, 2021.

Management and Monitoring:

9. *Nick Bloom and John Van Reenen., "Measuring and Explaining Management Practices Across Firms and Countries", *QJE* 2007

10. *Shengyu Li and Hongsong Zhang, "Does External Monitoring from the Government Improve the Performance of State-Owned Enterprises?", *The Economic Journal*, Volume 132, Issue 642, February 2022, Pages 675-708.
11. *Benkard, L., "Learning and Forgetting: The Dynamics of Aircraft Production", *AER*, 2000.

Section 5 (week 8-9): Market Structure, Innovation, and Industry Dynamics

1. Jovanovic, B., "Selection and the Evolution of Industry", *Econometrica*, Vol. 50, No. 3 (May, 1982), pp. 649-670
2. *Dunne, Timothy; Roberts, Mark J; Samuelson, Larry, "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries", *The Rand Journal of Economics*; Santa Monica Vol. 19, Iss. 4, (Winter 1988): 495.
3. Dunne, T., Roberts, M. and Samuelson, L., "The Growth and Failure of U.S. Manufacturing Plants", *QJE*, 1989.
4. *(Market Entry) Bresnahan, Timothy F. and Peter C. Reiss. 1991. "Entry and Competition in Concentrated Markets." *Journal of Political Economy* 99 (5): pp. 977-1009.
5. *Hopenhayn, H., "Entry, Exit, and Firm Dynamics in Long Run Equilibrium", *Econometrica*, 1992, 1127-1150
6. Aw., Chung, and Roberts, "Productivity, Output, and Failure: A Comparison of Taiwanese and Korean Manufacturers", *EJ*, 2003
7. Besanko et al, "Learning-by-Doing, Organizational Forgetting, and Industry Dynamics", *Econometrica*, 2010-03, Vol.78 (2), p.453-508
8. *Goettler, R. and B. Gordon (2011): "Does AMD spur Intel to innovate more?" *Journal of Political Economy*, 119(6), 1141-1200.
12. Luttmer, E., "Selection, Growth, and the Size Distribution of Firms," *Quarterly Journal of Economics*, 2007
13. *Z. Chen, X. Jiang, Z. Liu, and J.C. Suarez-Serrato, and D.Y. Xu, "Tax Policy and Lumpy Investment: Evidence from China VAT Reform", Oct, 2021, Accepted, *Review of Economic Studies*.

Section 6 (week 10-11): Market Friction and Firm Growth

1. Parente and Prescott, "Barriers to Technology Adoption and Development", *JPE*
2. *Hsieh and Klenow, "Misallocation and Manufacturing TFP in China and India", *QJE*, 2009
3. Hsieh and Klenow, "The Life Cycle of Plants in India and Mexico", *QJE*, 2014
4. *Virgiliu Midrigan and Daniel Xu, "Finance and Misallocation: Evidence from Plant-level Data", *American Economic Review*, Feb, 2014
5. Udry, C., and Conley, T., "Learning About A New Technology: Pineapple in Ghana", *AER*
6. *Atkin, Chaudhry, Chaudry, Khandelwal, and Eric Verhoogen, "Organizational Barriers to Technology Adoption: Evidence from Soccer-Ball Producers in Pakistan", *The Quarterly Journal of Economics*, Volume 132, Issue 3, August 2017, Pages 1101–1164

7. Atkin, Khandelwal, Osman, "Exporting and Firm Performance: Evidence from a Randomized Trial", *The Quarterly Journal of Economics*, Volume 132, Issue 2, May 2017, Pages 551–615
8. Cai, J. and Seidl A., "Inter-firm Relationships and Business Growth", *The Quarterly Journal of Economics*, Volume 133, Issue 3, August 2018, Pages 1229–1282.
9. Jie Bai (2021), "Melons as Lemons: Asymmetric Information, Consumer Learning and Quality Provision", *R&R at Review of Economic Studies*.
10. *Sangyoon Park, Zhaoneng Yuan and Hongsong Zhang, "Technology Training, Contract Trade, and Quality Upgrading in An Agricultural Supply Chain", March 2022.

Week 12: in-class presentation

IV. Required/Recommended Readings

Recommended readings:

1. Reiss, P., and Wolak, F. (2007): "Structural Econometric Modeling: Rationales and Examples from Industrial Organization," Handbook of Econometrics, volume 6.
2. Nevo, A., and M. Whinston (2010): "Taking the Dogma Out of Econometrics: Structural Modeling and Credible Inference," The Journal of Economic Perspectives, Spring 2010, 69-82.
3. Akerberg, D., L. Benkard, S. Berry, and A. Pakes (2006): "Econometric Tools for Analyzing Market Outcomes," Handbook of Econometrics, volume 6.
4. Jan De Loecker and Chad Syverson, "An Industrial Organization Perspective of Productivity", Handbook of Industrial Organization, 2021
5. Steven T. Berry and Philip A. Haile, "Foundations of Demand Estimation", Handbook of Industrial Organization, 2021.
6. Amit Gandhi and Aviv Nevo, "Empirical Models of Demand and Supply in Differentiated Products Industries", Handbook of Industrial Organization, 2021.

V. Course Policy

The University Regulations on academic dishonesty will be strictly enforced! Academic dishonesty is behaviour in which a deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or for another. It includes, but is not necessarily limited to, the following types of cases:

- a. Plagiarism - The representation of someone else's ideas as if they are their own. Where the arguments, data, designs, etc., of someone else are being used in a paper, report, oral presentation, or similar academic project, this fact must be made explicitly clear by citing the appropriate references. The references must fully indicate the extent to which any parts of the project are not one's own work. Paraphrasing of someone else's ideas is still using someone else's ideas, and must be acknowledged. Please check the University Statement on plagiarism on the web: <http://www.hku.hk/plagiarism/>
- b. Unauthorized Collaboration on Out-of-Class Projects - The representation of work as solely one's own when in fact it is the result of a joint effort.
- c. Cheating on In-Class Exams - The covert gathering of information from other students, the use of unauthorized notes, unauthorized aids, etc.
- d. Unauthorized Advance Access to an Exam - The representation of materials prepared at leisure, as a result of unauthorized advance access (however obtained), as if it were prepared under the rigors of the exam setting. This misrepresentation is dishonest in itself even if there are not compounding factors, such as unauthorized uses of books or notes.

You are expected to do your own work whenever you are supposed to. Incident(s) of academic dishonesty will NOT be tolerated. Cheating or plagiarism of any kind would result in an automatic FAIL grade for the course plus strict enforcement of all Faculty and/or University regulations regarding such behaviour.

VI. Others

Tips of Success:

The following tips will help you succeed in this class as well as make the class more enjoyable and useful for all concerned.

Attend class! (MOST IMPORTANT): Exams and homework are usually going to be based on lectures and exercises we discuss in class. You should think of the book as a complement to the lectures which gives you more detail in some issues, but it is in no way substitute for classes. Some things that you have to know are not necessarily in the textbook (for example, current events, extensions of book material, etc.). By attending every lecture, you will have a good feel for what is important and what I don't.

Participate in Class. A class in which no one participates becomes extremely difficult to enjoy. I will ask you questions and encourage you to participate in the discussions. I also hope that you too ask questions and/or share personal economic experiences with the class.

Frequently check Moodle and your email. I will post homework, summaries, practices and any other additional material on Moodle and I will let you know by email about important announcements.

Keep in touch throughout the length of the course. Don't ever hesitate to come to my office hours or sending me an email if you have any trouble with whatever we're studying in class.

Special Rules for the Class:

1. Turn off your cell phones or set its profile to be "vibrate"; be polite to me and your classmates. Other electronic devices such as notebook, iPad, etc., are not encouraged in class as well. If you must leave early, please let me know before the class starts.
2. Companion to class by any unregistered individual is prohibited.
3. The lecture sessions are periods dedicated to this course - not to finishing homework, not to extra-curricular activities, not to chatting with your friends.
4. In lectures, please ask questions and other observations as appropriate. Please feel free to ask for clarification if I am not making sense to you. Because the class is so large, however, those who wish to speak must raise their hands and be recognized. If you are speaking, speak loudly. If someone else is speaking, listen to him or her and see if you can answer the question or respond to the comment. I may call on you to attempt to answer a classmate's question. So, be prepared!
5. If you are speaking out of turn, and I judge your conversation to be distracting, I will ask you to leave the lecture. Please do not argue at that point. Feel free to come by my office and discuss it later. If you are talking loudly enough that I can hear you - regardless of the subject you are discussing - it is your responsibility to leave the lecture if I ask you to. Any student who disrupts the class may be subject to a penalty.