Syllabus: Labor Economics

February 19, 2024

1 Course Overview

This course in labor economics combines theoretical concepts with empirical methods to provide a comprehensive understanding of the field. The course is divided into two parts.

In the first part, we will cover the basics of the Roy model, a widely used model in modern labor economics. We will then delve into econometric methods and their application using the Roy model as a framework. Topics such as labor supply and wage determination, inequality, inter-generational mobility, and migration will also be discussed.

The second part of the course focuses on family economics. We will begin by reviewing dynamic models and their estimation techniques. We will then explore family formation through matching models, and delve into family decision models, including unitary and collective models. Topics such as the gender gap, retirement, and dynamic family decisions will be covered using these models.

The course aims to provide a broad understanding of the field and familiarize students with fundamental findings and developments in the literature to aid in future research.

2 Format

- Tuesday 14:20 - 17:20 (7, 8, 9)
- Social Science 306
- Credits: 3
- All lectures will be recorded for your future reference, but the course is designed to be an in-person experience with significant interaction and participation. Please plan accordingly.

3 Prerequisite

Prerequisites for this course include a course in intermediate microeconomics and econometrics. A solid understanding of these topics is required to fully participate in the course. In addition, for the second part of the course, we assume that you have a working knowledge of dynamic programming methods. Familiarity with graduate-level macroeconomics is beneficial but not strictly necessary.

4 Programming Language

This course emphasizes the importance of programming skills in modern empirical economic research. The default programming languages used in this course are R or Julia, and we strongly advise against using Stata as it may be difficult to work with when completing problem sets.

Programming is a key component of this course and students should be prepared to spend significant time cleaning data, coding models, and analyzing data. To assist in learning these skills, we utilize DataCamp, an online platform for learning programming. All students in this course will have access to DataCamp, and assignments will encourage students to complete relevant courses on the platform.

Additionally, this course will focus on the use of administrative data which may require offline usage and have limited computer memory. Problem sets will include working with large datasets and will require students to write efficient code.

We encourage students to employ all modern technologies that can assist in their research. This includes utilizing tools such as OpenAI to proofread reports and papers.

5 Assignments

Practice is essential to mastering the skills covered in this course. To facilitate this, biweekly problem sets will be assigned for both parts of the course, leading up to the midterm exam. Completing these assignments is critical for achieving a deep understanding of the material. Additionally, students are required to sign up for the NBER working paper series in order to stay current with recent research in the field.

6 Reports

In this course, you will be required to complete four reports throughout the year. There are two options for these reports: replicating a classic paper of your choice using Taiwanese data, or conducting your own research on a topic of your choice. Both options provide the opportunity for you to develop the project further and potentially use it as a basis for a master's or bachelor's thesis. You can choose to work on the project independently or with a classmate. The course will cover various topics in labor economics, with a focus on applying modern methods and research designs to questions that have not been studied in the Taiwanese context. The goal is to replicate the original paper in a Taiwanese context and use unique features of the data or policy environment to contribute to the existing literature.

We have four check points throughout the year.

- Spring Midterm Report: Choose a topic and paper to replicate, and review relevant literature in Taiwan and abroad.
- Spring Final Report: Develop a detailed proposal for the methods and model to be used, and prepare for data access.
- Fall Midterm Report: Present main results.
- Fall Final Report: Submit a completed paper.

7 Grading

Homework 20%, midterm exam 20%, midterm report 30%, final report 30%. Note that everything should be typed up in English with LaTeX.

8 Weekly Schedule

First Semester (Spring)

Week 1: Overview

The overview will provide a helicopter view of the topics we will cover throughout the year. We will introduce essential facts about each topic and preview what we will learn.

We will also spend some time discussing presentation skills, helpful advice for conducting empirical research, and even some philosophy of economic methodologies.

More practically, we'll introduce some miscellaneous computation and work-related skills that I found helpful. E.g., Github, Trello, debugger, memory control issues. Finally, we will introduce some valuable data resources.

Week 2: Roy Model

We will introduce the Roy model by Roy (1951), the workhorse model for modern labor economics. This is the central theme of the course. We will see that almost everything we see is an application of the Roy model.

Reading: Roy (1951)

Week 3: Roy Model and Potential Outcome Framework

We soon discover that the potential framework and the results from LATE are equivalent to the Roy model (Vytlacil, 2002). We present the equivalence results and talk about the implication of the framework.

Reading: Heckman (2010), Vytlacil (2002), and French and Taber (2011)

Week 4: Econometric Review: Control Variables

This lecture discusses control for observables and matching techniques and their limitation. Many of these are covered in Angrist and Pischke (2008).

Reading: Angrist and Pischke (2008) chapter 1-3

Week 5: Econometric Review: Instrumental Variables

In this lecture, we review the fundamental of instrument variables. We again view IV in the Roy model framework and extend the discussion to marginal treatment effects. We then discuss the extrapolation of identification.

Reading: Mogstad and Torgovitsky (2018) and Angrist and Pischke (2008) chapter 4

Week 6: Econometric Review: Panel Data

We briefly talk about difference-in-differences estimates. We then discuss difference-in-differences designs. We then cover the recent findings: two-way fixed effects regression generally does not recover causal effects even with parallel trends.

Reading: Callaway and Sant'Anna (2021), Roth et al. (2022) and Angrist and Pischke (2008) chapter 5

Week 7: Midterm Exam

Week 8: Labor Supply

We will talk about topics in labor supply, including various versions of labor supply elasticities. We pay special attention to simple static models and discuss empirical challenges in estimating these models.

Reading: Keane (2011) and Chetty et al. (2011)

Week 9: Schooling and On-the-Job Learning

This week we briefly introduce human capital investment and return in the labor markets. We will talk about the Ben-Porath model and its empirical implications on wage equations. We will also discuss Katz and Murphy (1992).

Reading: Mincer (1958), Ben-Porath (1967), Heckman et al. (2006), and Katz and Murphy (1992)

Week 10: Skills, Tasks, and Occupations

We discuss a more recent framework that uses skills and tasks to explain trends in wage distributions and "job polarization."

Reading: Acemoglu and Autor (2011)

Week 11: Role of Firms: Monopoly, Monopsony, and Technology

After studying the supply side, we turn to labor demand. We examine the discussion in firm heterogeneity, market power, and technology.

Reading: Deming and Kahn (2018)

Week 12: Discrimination

We discuss one more potential source of wage dispersion. We focus on gender-unrelated discrimination this week. We will also touch on the design of audit studies and how they can be applied to study discrimination.

Reading: Kline et al. (2022)

Week 13: Inequality and Inter-Generational Mobility

We move beyond the determination individual's wages and introduce its distributional characteristics. We discuss inter-generational studies by introducing the canonical Becker and Tomes (1979) model.

Reading: Becker and Tomes (1979)

Week 14: Migration

This week we discuss migration. Though this is a seemingly different topic from the previous weeks, we will find that it is another application of the Roy model.

Reading: Borjas (1987)

Week 15: Final Presentation and Discussion

Second Semester (Fall)

Week 1: Econometric Review: Dynamic Programming

We will briefly review dynamic methods in economics. In contrast to the materials taught in macroeconomics, we focus on combining theories and empirical works. We will talk about Rust (1987)'s famous engine replacement model as a review of dynamic programming.

Reading: Rust (1987)

Week 2: Econometric Review: Dynamic Model Estimation: MLE and SMM

After reviewing the basic dynamic methods, we introduce their central application in modern labor economics – life cycle models. We discuss key elements of life cycle models, including identification and estimation.

Reading: Low and Meghir (2017)

Week 3: Econometric Review: Dynamic Model Estimation: CCP

We introduce a class of models with unique properties and easier to estimate. They are tightly linked to the life cycle models, and one does not even need to solve the model before estimating it. We also introduce modern estimation methods that apply machine learning techniques such as GNNs in Kaji et al. (2020).

Reading: Aguirregabiria and Mira (2010), Arcidiacono and Ellickson (2011), and Kaji et al. (2020)

Week 4: Dynamic Labor Supply Model

After reviewing the econometric methods, we turn back to our theme and talk about the canonical dynamic labor supply model, such as Keane and Wolpin (1997). We then introduce more complicated models that introduce the power of these models, including Low and Pistaferri (2015) and Blundell et al. (2016)

Reading: Keane and Wolpin (1997), Low and Pistaferri (2015) , and Blundell et al. (2016)

Week 5: Midterm Exam

Week 6: Matching

We will start investigating family economics this week. We begin with marriage formation by introducing the canonical matching models. We discuss Gale and Shapley (1962)'s algorithm. With that in mind, we then talk about how data is brought to matching models by Choo and Siow (2006) and a more general case in Galichon and Salanié (2021).

Reading: Gale and Shapley (1962), Choo and Siow (2006), and Galichon and Salanié (2021)

Week 8: Sorting

We return to wage determination this week. We introduce another strand of the literature: sorting in the labor market. We begin with the canonical model proposed by Abowd et al. (1999), and then discuss challenges in identification and estimation with Bonhomme et al. (2020).

Reading: Abowd et al. (1999) and Bonhomme et al. (2020)

Week 9: Unitary Model

Different ways of modeling family decisions exist. One of the most straightforward starting points is the unitary model. We introduce the implications and restrictions of the unitary model.

Reading: Browning et al. (2014) chapter 1-3

Week 10: Collective Model

Because of the limitations of the unitary model, modern family decisions commonly apply collective models. We discuss the identification and estimation of collective models

and their possible extensions.

Reading: Browning et al. (2014) chapter 4-6

Week 11: Dynamic Family Models

All topics covered in the second part have been combined and developed into a three-stage model that endogenizes key elements of life cycles. This week we study Chiappori et al. (2018) and discuss how these methods can be combined to explore a wide range of policies.

Reading: Chiappori et al. (2018)

Week 12: Gender Gap

We apply the tools we developed throughout the course to discuss the gender gap. After a very brief introduction with model-free evidence, we look at Mulligan and Rubinstein (2008) to see how the Roy model explains the gender wage gap. We also provide another way to look at this question as in Chiappori et al. (2009).

Reading: Bertrand et al. (2015), Cook et al. (2021), Chiappori et al. (2009), and Mulligan and Rubinstein (2008)

Week 13: Fertility

One of the key factors that leads to gender differences is fertility. We introduce fertility models this week and discuss the empirics behind these models.

Reading: Becker (1992) and Blundell et al. (2016)

Week 14: Retirement

The last topic we look at is retirement. We again apply the life cycle model to study retirement, savings, and pensions. We will also touch on more recent work on savings and long-term care, such as Ameriks et al. (2020).

Reading: De Nardi et al. (2010), French (2005), and Ameriks et al. (2020)

Week 15: Final Presentation and Discussion

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