Introduction

Investment, Finance and Asset Prices ECON5068

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Course Overview - Introduction and Learning Outcome

In this course, we are going to think about:

- How do firms **optimally decide on investments** (expansions of capacity)?
- Study the relationship between **firm investment and firm borrowing.**
- Understand how investment **influences firm's market valuation**.

Course Topics:

1. **Investment:** Macro and Micro Facts, Firm decision making
2. **Toolbox:** Dynamic Programming, Constrained Optimisations
3. **Adjustment Costs:** and Tobin's Q model of investment
4. **Spikes and Lumpy Adjustment** aka Menu/Nonconvex Costs
5. **Uncertainty and Inaction**

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Who am I? What do I do?

- PhD in Economics 2023, working with a mix of data and models
- Interested in **Firm Dynamics, Monetary and Fiscal Policy, Labour Markets**
- Day-to-day I am paid by UofG to research topics on firm investment
- Later lectures close to what I use in my own work

Objectives (the skills and knowledge this course offers you)

- formulate dynamic economic problems in a logically coherent fashion
  - identify key facts in data driving modelling assumptions
  - write down firm's constrained optimisation problem
- apply advanced analytical methods to the solution of dynamic and stochastic economic problems
  - solution methods of these models with pen and paper
- apply numerical methods to solve dynamic and stochastic economic models computationally
  - solve the model on the computer (matlab, julia, python etc.)
- demonstrate knowledge of alternative investment theories and explain how they are tested empirically
  - strengths and weakness of models versus the facts in the data

Schedule

- Lectures, 10 weeks: Group 1: Wednesdays (3PM) OR group 2: Thursdays (1PM)
- Tutorials (3) and Labs (4) (see calendar, specific weeks only)
- Office hours (Calendly to book, probably Friday mornings until 1PM)
- Depending on demand:
  - code clinic for bugs with assignment
  - revision lecture closer to exam

Course Overview

- **What is expected of you?**

- Study consistently - Lectures, Tutorials, Computation Labs.
  - Revise the material after every lecture and tutorial.
  - **Work in groups!!**.

- What do employers want?
  - Knowledge and understanding of **workhorse models**.
  - **Numerical skills** in Matlab/Python/Julia to solve them.
  - Familiarity with the **macro and micro facts**

- We will test your (1) **knowledge and understanding** of key concepts from lectures/tutorials and (2) your **skills** in solving models analytically and computationally.

Course Assessment

- (1) A **Group Assignment** and an (2) in-person **Degree Exam.**

- Exams:
  - Degree Exam (75%)
  - Group Assignment (25%)
  - Tutorials and Labs are here to help with assessments!

- See previous year's exam questions and tutorial/lab or practice questions (the last one) to get an idea of the style and difficulty of degree exam.

Reading

- This course - economics + mathematical techniques + numerical (computational) methods.

- The **core textbook** that covers dynamic programming and firm investment:
  - Dynamic Economics: Quantitative Methods and Applications by Jerome Adda and Russell Cooper (pdf is online, library seems to have lost their only copy!)

- For all the **necessary mathematical techniques**:
  - Mathematics for Economics by Carl P Simon and Lawrence Blume.

- If you do not have the economics background:
  - *Advanced Macroeconomics* by Romer.
  - *Intermediate Microeconomics : A Modern Approach* by Varian

- To learn Matlab:
  - see training videos at `https://matlabacademy.mathworks.com/`
  - forum: https://stackoverflow.com/
  - practice and make mistakes: debugger in matlab is very good