L13509 Advanced Monetary Economics

The University of Nottingham

2018

Instructor

- Adam Hal Spencer (Assistant Professor of Economics).
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Meetings and dates

- **Class dates**: Lectures: weeks 2 – 12. Tutorials: weeks 9 – 11.
- **Class days/times**: Lectures: M (13:00 – 14:00); Tu (11:00 – 12:00). Tutorials: check your personal timetable.
- **Exams**: TBA.

Course description

In this module, I'll introduce you to several macroeconomic models of money. We'll start by looking at the most basic form of dynamic stochastic model — the real business cycle model — without money. We'll then think about variants that have been used by researchers over time to incorporate money: in particular the money in the utility function, cash in advance and overlapping generations models. From there the course will become more focused: I will spend several lectures on the workhorse model of modern monetary economics — the new Keynesian model — and techniques used in solving it. This part of the course is especially important for those of you who have ambitions to work for central banks: their employees use this framework extensively. Next, I will move to a rival research agenda known as new monetarism and its applications. Finally, I'll spend the last few lectures on topics in finance: asset pricing, corporate finance and financial intermediation.

This module is aimed at equipping you with tools: all of these models are tools useful for answering both qualitative and quantitative questions about the macroeconomy in research. I take this approach for several reasons. The first is that I am a researcher and this is what I find interesting. The second is that modelling techniques are used by policymaking institutions (e.g. central banks, development institutes) and it will be useful for you to have some background in this when you enter the professional workforce. The third reason is that I want to give you some idea of what academic economics is like in case you wish to consider graduate school at some point in the future.

In short — I'm excited to deliver this course to you! The number of topics I plan to cover throughout the semester is ambitious, but I see this as a good thing. There will be lots of material for you to understand to do well, but if you study hard and cover all of the material thoroughly I will reward you with a high grade.

Mathematics

This module will be mathematical in nature. I will not expect you to write complicated proofs or anything like that, but there will be some techniques that you will be required to master and apply constantly throughout the module. In particular, some of the techniques we'll make use of are

- Constrained optimisation (static, dynamic discrete and continuous time).
- Linearisation techniques.
- Basic probability theory.

If it's been a while or if you're low in confidence with math, don't stress! I will dedicate two lectures to reviewing the mathematical techniques necessary for the course (L1 and L15). In addition, you'll have tons of opportunities to practice these techniques in exercise sets and problem sets. If you understand the math in lecture notes and exercise sets, you have sufficient mathematical background to attain maximum performance in this module.

Exercise Sets

Each set of lecture notes will be accompanied by an exercise set and solutions. The purpose of these sets is to give you practice for the assessment of the module and help your understanding of the material. **I will not grade these exercise sets** and you can view them as being optional or non-compulsory with regard to your final grade. They are there to help you and I highly recommend solving them all before the assessment as they are a strong indicator of the type of problems I will ask you in the exam.

Problem Sets

There are three problem sets that will be due throughout the semester **that will be for credit**. You are encouraged to solve these all on your own, again as they are good preparation for the final exam. However, I need you to turn in your final answers for grading in **groups of three or four students**. I want to encourage team work and collaboration in this class so I will not accept solution writeups by individuals. You must work in the same group for all three problem sets, (obviously excluding unexpected drop-outs and the like). These can either be typed or handwritten.

I'd like to know what groups you plan to work in **prior to the first problem set being deliverable**. I have created a Google spreadsheet that is on the course website. Once you've formed a group of three or four, please select one group member to write the surnames names of **each member** into one of the cells on the spreadsheet.

The due date schedule is in the lecture schedule that follows. The problem sets should all **be handed in to me at the start of class**.

Computing Skills

I don't assume that you have any background in computing and programming. It would be helpful if you had a rudimentary understanding of Matlab to get the most out of this course but it's not necessary. I will talk about computing in terms of model solving several times throughout the course. I will detail how to use a software package called Dynare. You can read more about how to install and utilise this package at the following link: `www.dynare.org`. Again though, I'll walk you through how to use this in detail: nothing will be assumed in advance.

References

I have no required books or other texts for the course. It is designed to be self-contained with the material in the lecture slides and exercises. A reference that may be helpful for the new Keynesian part of the course is Gali (2008), "Monetary Policy, Inflation and the Business Cycle". But again, all the required material is in the lecture slides.

Tutorials

There will be three tutorials held in the last three weeks of semester. These are again for more practice and revision for the exam. I'll give you some more exercises to work through individually and then we'll go through all the solutions together.

Assessment

The assessment is comprised of

- Three group problem sets collected at various times throughout semester (see below): 25%.
- Final exam at the end of semester: 75%.

Lecture schedule

Class	Date	Topic	Due
1	01/10/2018	Introduction and Mathematical Preliminaries	
2	02/10/2018	Real business cycle model (RBC)	
3	08/10/2018	Keynesian v.s. Monetarist thought Introduction to modelling money	
4	09/10/2018	Money in the utility function model (MIU)	
5	15/10/2018	Cash in advance model (CIA)	
6	16/10/2018	Overlapping generations model (OLG)	
7	22/10/2018	New Keynesian model I: imperfect competition	~~PS 1~~
8	23/10/2018	New Keynesian model II: sticky prices	
9	29/10/2018	New Keynesian model III: new Keynesian Phillips curve	
10	30/10/2018	Solving DSGE models I: analytical methods	PS 1
11	05/11/2018	Solving DSGE models II: numerical methods	
12	06/11/2018	New Keynesian model IV: optimal monetary policy	
13	12/11/2018	New Keynesian model V: fiscal multipliers	
14	13/11/2018	New Keynesian model VI: zero lower bound	
15	19/11/2018	Fundamentals of continuous time methods	~~PS 2~~
16	20/11/2018	New Monetarist model I: first generation	PS 2
17	26/11/2018	New Monetarist model II: second generation	
18	27/11/2018	New Monetarist model III: third generation	
19	03/12/2018	Finance I: asset pricing	
~~20~~	~~04/12/2018~~	~~Finance II: corporate finance~~	
20	10/12/2018	Finance II: corporate finance	PS 3
21	11/12/2018	Finance III: financial intermediation	

Tutorial schedule

Class Week	Topic
Week 9	RBC, MIU, CIA, OLG models
Week 10	New Keynesian model
Week 11	New monetarist model