

# Applied Macroeconomics: Heterogeneity and Macro

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This is a course on empirical macroeconomics with a focus on using micro data and models with microeconomic heterogeneity to understand macro phenomenon. Recent increases in computational power and the availability of "big data" have been transformational in empirical macroeconomics. The use of micro data provides additional discipline on macroeconomic models and often leads to insights or conclusions that differ from analysis using aggregate data alone. In this course, we will discuss the computational and empirical tools necessary to bring micro data to heterogeneous agent macro models and discuss multiple ways to use micro data to discipline and test macroeconomic models.

This provides an overview of the course material I will cover and relevant readings for each topic. Readings in bold I will cover in class and are required reading. Papers with \* are options for student presentations. These are concentrated in the housing related applications since this has been an active area of recent research, and it also makes more sense for the student presentations to not be in the first few weeks so you have time to prepare.

Given that I am only teaching 5 weeks this year, I am going to begin with only a brief overview of some basic facts and will focus most of the course on "Ss models". These models feature fixed costs of adjustment and give rise to policies which feature some periods of "inaction" punctuated by "lumpy adjustment". I will begin with some basic theoretical results, and then we will discuss three broad applications where these frictions have been used to generate micro implications from micro data patterns: 1) Price-setting 2) Volatility/Uncertainty 3) Housing. So the first couple of weeks will be on "methods" and tools and then the next three weeks will be on various empirical applications.

# 1. Details and Course Requirements

What I ask of you: 1) Read all the bold readings. 2) Ask questions and participate in class. 2) Come to class with an eye towards new research questions.

Requirements: There will be two problem sets, a short presentation of an existing paper and a referee report on that paper.

## (1) Quantitative homework assignments

There will be two homework assignments in the course solving and programming simple extensions of models that we discuss in class and doing some basic data work. This is to get you experience actually working with these models and tools.

## (2) Presentation of Important Existing Papers

You will be required to present existing papers in class. I will cover the most important papers and provide broad overviews of topics myself, but a significant portion of the important literature for the course will be presented by students (to provide you additional practice with presentation). The length of these presentations will vary depending on enrollment in the course, but will probably be about 20-30 minutes each. We will split these presentations between my half of the course and Rohan's, but if enrollment is sufficiently large I may have you do these presentations in groups. You are mainly responsible for explaining the paper you are presenting to your classmates to get practice at effectively conveying finished research ideas, but I would also like you to spend a bit of time discussing what you like and dislike about the paper. On the reading list, I have designated various papers that are available for student presentations. As mentioned above, these are concentrated in the housing related. These will be allocated roughly first come-first served, although I will also encourage students to select papers that end up giving a diverse set of methods and topics since some of the papers are somewhat similar to each other. Also if there is some other closely related paper you are more interested in presenting, that is probably OK: just stop by and talk to me or send me an email.

## (3) Referee report

For the paper you present in class you will be required to turn in a three-page "referee report". Unlike your presentation in class, the goal of the referee report is not primarily explaining the paper. **Instead the referee report should be focused on evaluating the merits of the paper.** That is, what do you like about the paper, what are the limitations of the paper, what suggestions do you have for changes? How does this paper relate to other papers and does this seem like an important contribution? I know most of you have never seen an actual referee report so I will also provide some additional guidance on this front.

## **2. Topics Overview:**

### **Topic 0 – Heterogeneity and Macro: Data Overview and Motivating Facts**

This topic will briefly overview a variety of micro data sources and will present some basic facts on heterogeneity. These will focus on price-setting because there are better survey articles and because I'm going to take price-setting facts as given when we turn to models and ask how well models can explain them. That is, the price-setting and uncertainty lectures are going to mainly take micro facts as given and focus on using models to explain these facts. Many of the housing papers will be more empirical in the sense of documenting new facts, so we will naturally discuss the data when discussing those papers.

### **Topic 1 – Ss Models: Macro Implications of Micro Inaction**

Topic 2 will focus on theoretical models of inaction. We will begin with analytical results and stylized examples and then will turn to more empirically realistic versions of these models that need to be solved numerically. We will discuss in detail how to implement these model solutions. The main context that we will derive these models in is price setting, but we will then turn to two additional applications in topics 3 and 4.

### **Topic 2-Volatility and Uncertainty**

This topic will discuss some empirical evidence on changes in volatility and uncertainty across time and then will explore their implications in Ss models with specific discussion of the extent to which such shocks might plausibly explain recessions and whether they have effects on stimulus policy.

### **Topic 3-Housing and Mortgage Markets**

One of the most important “lumpy” economic variables is housing. In this topic we will discuss macroeconomic implications of housing and mortgage finance. We will begin with direct effects of housing on the economy, for example discussing evidence of effects of house price movements on consumption and on broader inflation and exploring channels for such effects. We will then discuss interactions between housing and macro policy, arguing that housing finance leads to interactions between leverage and the effects of monetary policy and briefly touch on some related ideas on fiscal policy.

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