Syllabus

[cmcd.economia@fgv.br]

Course Name: Introduction to HANK models
Faculty:

2026 DECEMBER

COURSE OUTLINE

In this course students will be introduced to the new generation of New Keynesian Models featuring heterogeneous households – the so-called HANK, a so far promising marriage between end of the 1990s real models featuring heterogenous agents, and the workhorse of modern monetary macro. As we will see, HANK honors Keynes' view of the macroeconomy much more than its predecessors by given prominence to income effects (who believes in intertemporal substitution anyways?!). We start discussing the dissonance between the predictions of the standard single agent (RANK) model and what we observe in the real world. Next, we go on to argue that models featuring heterogeneity and uninsurable idiosyncratic income risk can better match some of these patterns.

We then take a closer look at HANK's immediate predecessor, the Two Agents New Keynesian model, aka TANK. Some important departures from the traditional model already appear in this setting, such as the demise of the Ricardian Equivalence. But although TANK models provide us with new insights and are much better at explaining empirical phenomena, heterogeneity in TANK is still very coarse and unrealistic (but easy to model). So, we move on to the heterogeneity-rich HANK models, first analytically to build intuition and then computationally. But before HANK, we will meet HANC, the neoclassical version developed by Krusell and Smith in 1998. This is the first paper to add macro shocks to heterogeneous agents models.

We start doing a lot of algebra, studying the pen and paper version of HANK models, to get some nice intuition. Then we move on to implementation, which is not a walk in the park because now an infinite dimensional object becomes a state variable -- the wealth distribution. There are different ways to do HANK in the computer, two of which are associated with discrete time modelling and one with continuous time. We will discuss a bit of all of them but will focus on numerical methods for HANK in discrete time. Our scarce time and my scarce wits mean we will focus in understanding the Sequence Space Jacobian method, developed by Adrien Auclert and co-authors.

COURSE PROGRAM

- **Introduction** – why bother with heterogeneity? Empirical evidence on marginal propensities to consume. The birth of the TANK model. Shocks amplifiers.
- **Say no to RANK and maybe to TANK** - Ricardian equivalence and incredibly coarse heterogeneity (I might be overselling it).
- **Krusell and Smith** – adding macro shocks to Rao Ayagari's paper (geniuses, gigantic)
- **Behold the Forward Guidance Puzzle**. This is here because people were enthusiastic about HANK solving it. But they were wrong. Life is hard.
- **Tractable HANK models,** courtesy of Ivan Werning and Florin Bilbiie. Prepare for algebra.
- **It is python time! Solving the steady state.** Focus on finding SS distribution and policy functions
- **It is python time again! Using the Fake News algorithm to solve transitional dynamics.** In this part we will learn how to treat MIT shocks.
- **More Python and SSJ:** applications. Fiscal Policy / FG puzzle / Open Macro.

BIBLIOGRAPHY

- Tom Sargent and Lars Ljungqvist, Recursive Macroeconomic Theory, 2nd or higher edition, chapters 17-19 on incomplete markets.
- Kaplan and Violante, Microeconomic heterogeneity and Macroeconomic shocks, *Journal of Economic Perspectives,* 2018.
- Kaplan, Moll and Violante. Monetary Policy according to HANK, *American Economic Review,* 2018.

- Bilbiie, Florin. "The New Keynesian Cross", *Journal of Monetary Economics*, 2020.
- Auclert and cia. Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models, *Econometrica*, 2021.

GRADING

(a) A group (max 3 people) 30 minutes presentation in January (via Teams).

(b) A take home exam.

Grade = 0.4*(a)+0.6*(b)

CONTACT