Econ 411-3: Macroeconomics, Spring 2024

Matthew Rognlie

Class Overview. This class is broadly about "heterogeneity in macro": what happens when we replace the simple representative-agent households and firms from the previous two quarters with richer, heterogeneous-agent models of consumption, savings, and production? We will be especially interested in the macro implications—what these richer models imply for classic macro questions like long-run real interest rates, monetary and fiscal policy, and inflation—but we will also spend some time on inequality and distributional considerations.

Course Organization. The class meets Tuesdays and Thursdays from 9:00 am to 10:50 am in KGH 1410. A TA session will meet Fridays 11:00 am to 12:50 pm.

I will primarily use Canvas announcements to communicate with the class. Please make sure your notification preferences are set so that you receive email copies of class announcements.

Grading and Assessment. The course grade will be based on three components: problem sets (30%), a midterm exam (25%), and a final exam (45%). The midterm will take place in class on April 30 (Tuesday), at the normal class time. The final will take place June 4 (Tuesday), from noon to 2:00 pm.

Problem sets can be done in groups of up to four, and only one answer needs to be handed in for each group (but please remember to list the names of all members of the group!). All answers should be typeset (or in the form of a Jupyter notebook), *not* handwritten.

Contact information. I can be reached by email at `matthew.rognlie@northwestern.edu`. My office hours will be Tuesdays immediately after class, 11:00 AM to 12:00 PM, although in a few cases I may need to reschedule.

The teaching assistant for the class is Jose Lara: `joselara@u.northwestern.edu`.

Materials. There is no official textbook for the class, and in general I will provide all necessary material. For related reading, especially for the first part of the class, it is possible you will find the following useful:

Ljungqvist, L. and Sargent, T.J. (2018). *Recursive Macroeconomic Theory*. 4th ed. MIT Press

Dirk Krueger's macroeconomic theory manuscript[1] and consumption-savings manuscript, which I will post on Canvas, have some relevant content, as is the heterogeneous-agent part of:

Heer, B. and Maussner, A. (2009). *Dynamic General Equilibrium Modeling: Computational Methods and Applications*. Springer Science & Business Media

[1] Currently available at `https://perhuaman.files.wordpress.com/2014/06/macrotheory-dirk-krueger.pdf`

Computation. This course will require a significant amount of programming and computation. I will post Python code for many of the lectures (often in Jupyter notebook form), and most of you will likely want to build on that code for your assignments—although you are free to use any other language as well if desired.[2]

There are many good resources available online for learning numerical Python, and it is easy to Google. If you are relatively new to Python, I recommend installing the Anaconda distribution to get all the key numerical, scientific, and data functionality you need out of the box. If you want to get started from the basics in an econ context, the new QuantEcon intro lectures are also a good resource. I'll post additional materials on the Canvas course page.

Preliminary list of course topics and some relevant references.

1. Standard incomplete markets and life-cycle models: partial equilibrium and steady-state general equilibrium implications, and comparison to the data.

    - Aiyagari, S.R. (1994). Uninsured Idiosyncratic Risk and Aggregate Saving. *The Quarterly Journal of Economics* 109(3):659–684
    - Auclert, A., Malmberg, H., Martenet, F. and Rognlie, M. (2021b). Demographics, Wealth, and Global Imbalances in the Twenty-First Century. Working paper, National Bureau of Economic Research
    - Kaplan, G., Violante, G.L. and Weidner, J. (2014). The Wealthy Hand-to-Mouth. *Brookings Papers on Economic Activity* 45(1 (Spring)):77–153
    - Fagereng, A., Holm, M.B. and Natvik, G.J. (2021). MPC Heterogeneity and Household Balance Sheets. *American Economic Journal: Macroeconomics* 13(4):1–54
    - Heathcote, J., Perri, F. and Violante, G.L. (2010). Unequal We Stand: An Empirical Analysis of Economic Inequality in the United States: 1967-2006. *Review of Economic Dynamics* 13(1):15–51
    - Kopczuk, W. (2015). What Do We Know About the Evolution of Top Wealth Shares in the United States? *Journal of Economic Perspectives* 29(1):47–66
    - Moll, B., Rachel, L. and Restrepo, P. (2022). Uneven Growth: Automation's Impact on Income and Wealth Inequality. *Econometrica* 90(6):2645–2683
    - Jones, C.I. (2015). Pareto and Piketty: The Macroeconomics of Top Income and Wealth Inequality. *Journal of Economic Perspectives* 29(1):29–46
    - Benhabib, J. and Bisin, A. (2018). Skewed Wealth Distributions: Theory and Empirics. *Journal of Economic Literature* 56(4):1261–91

2. General equilibrium dynamics, and monetary and fiscal policy in heterogeneous-agent New Keynesian (HANK) models.

[2]Personally, I would recommend Python, or possibly Julia, and only some other language if you are very familiar with it and think the transition costs are too high—which they usually are not in your first year.

- Boppart, T., Krusell, P. and Mitman, K. (2018). Exploiting MIT Shocks in Heterogeneous-Agent Economies: the Impulse Response as a Numerical Derivative. *Journal of Economic Dynamics and Control* 89:68–92
- Auclert, A., Bardóczy, B., Rognlie, M. and Straub, L. (2021a). Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models. *Econometrica* 89(5):2375–2408
- Kaplan, G., Moll, B. and Violante, G.L. (2018). Monetary Policy According to HANK. *American Economic Review* 108(3):697–743
- Auclert, A., Rognlie, M. and Straub, L. (2018). The Intertemporal Keynesian Cross. Working paper, National Bureau of Economic Research

3. Deviations from full-information rational expectations.

   - Auclert, A., Rognlie, M. and Straub, L. (2020). Micro Jumps, Macro Humps: Monetary Policy and Business Cycles in an Estimated HANK Model. Working paper, National Bureau of Economic Research
   - Carroll, C.D., Crawley, E., Slacalek, J., Tokuoka, K. and White, M.N. (2020). Sticky Expectations and Consumption Dynamics. *American Economic Journal: Macroeconomics* 12(3):40–76
   - Gabaix, X. (2020). A Behavioral New Keynesian Model. *American Economic Review* 110(8):2271–2327

4. Models of price-setting and inflation: time-dependent, state-dependent, multisector, etc.

   - Rubbo, E. (2022). Networks, Phillips Curves, and Monetary Policy
   - Auclert, A., Rigato, R.D., Rognlie, M. and Straub, L. (2022). New Pricing Models, Same Old Phillips Curves? Working paper, National Bureau of Economic Research

5. Production and substitution in economies with multiple sectors and input-output structure.

   - Baqaee, D. and Rubbo, E. (2022). Micro Propagation and Macro Aggregation
   - Oberfield, E. and Raval, D. (2021). Micro Data and Macro Technology. *Econometrica* 89(2):703–732

6. Macro data, national accounts, and secular trends:

   - Leamer, E.E. (2007). Housing is the Business Cycle. In: *Proceedings-Economic Policy Symposium-Jackson Hole*, pp. 149–233. Federal Reserve Bank of Kansas City
   - Basu, S. (2019). Are Price-Cost Markups Rising in the United States? a Discussion of the Evidence. *Journal of Economic Perspectives* 33(3):3–22
   - Karabarbounis, L. and Neiman, B. (2019). Accounting for Factorless Income. *NBER Macroeconomics Annual* 33(1):167–228

- Rognlie, M. (2018). Comment on "Accounting for Factorless Income". In: *NBER Macroeconomics Annual 2018, volume 33*, pp. 235–248. University of Chicago Press
- Cummins, J.G. and Violante, G.L. (2002). Investment-Specific Technical Change in the United States (1947–2000): Measurement and Macroeconomic Consequences. *Review of Economic dynamics* 5(2):243–284