Course Plan:

Adv. Macro: Heterogeneous Agent Models

Nicolai Waldstrøm (NW)

All articles are posted under »Files« on Absalon

1 Computational techniques

• Lecture 1. Introduction

Required reading: None

Additional material: Heathcote et al. (2009); Kaplan and Violante (2018); Cherrier et al. (2023)

Recap on dynamic programming and associated numerical methods: See the lecture "3 - Dynamic optimization" in the course Introduction to Programming and Numerical Analysis

• Lecture 2. Consumption-saving

Required reading: Kaplan and Violante (2014)

Additional material: Harmenberg and Öberg (2021); Kaplan and Violante (2022);

• Lecture 3. Stationary equilibrium

Required reading: Aiyagari (1994)

Additional material:

• Lecture 4. Transition path

Required reading: Documentation for GEModelTools (except on linearized solution and simulation)

Additional material: Auclert et al. (2021b); Kirkby (2017)

• Lecture 5. Assignment Workshop I

2 Applications without pricing frictions

• Lecture 6. Wealth Inequality

Required reading: Hubmer et al. (2021)

Additional material: De Nardi and Fella (2017); Guvenen et al. (2023); Ozkan et al. (2023);

• Lecture 7. Secular Stagnation

Required reading: Auclert et al. (2021c)

Additional material: Straub (2019); Mian et al. (2021)

3 Applications with pricing frictions

• Lecture 8. The New Keynesian model

Required reading: Documentation for GEModelTools

Additional material: Auclert et al. (2021b); Boppart et al. (2018); Auclert et al. (2021a) Recap on the standard New-Keynesian model: Azzimonti et al. (2024) (link), chapter 16 or Galí (2015), chapters 3-4

• Lecture 9. Fiscal Policy in HANK models

Required reading: Auclert et al. (2023) Additional material: McKay and Reis (2016); Hagedorn et al. (2019); Bayer et al. (2019); Angeletos et al. (2024)

• Lecture 10. Assignment Workshop II

Required reading:
Additional material:

• Lecture 11. Monetary Policy in HANK models

Required reading: Kaplan et al. (2018); Additional material: Werning (2015); Bayer et al. (2019); Alves et al. (2020); Auclert et al. (2020)

• Lecture 12. HANK-SAM (JD)

Required reading: Broer et al. (2024) Additional material: Ravn and Sterk (2021); Bardóczy and Guerreiro (2023)

• Lecture 13. I-HANK

Required reading: Druedahl et al. (2024b) Additional material: Auclert et al. (2024), Druedahl et al. (2024a), De Ferra et al. (2020)

• Lecture 14a. Advanced HANK topics

Required reading:

Additional material: Auclert et al. (2020); Maxted et al. (2024); Davila and Schaab (2023); McKay and Wolf (2023)

4 Conclusion

• Lecture 14b. Exam preparation

References

- Aiyagari, S. Rao. 1994. "Uninsured idiosyncratic risk and aggregate saving". Publisher: MIT Press, *The Quarterly Journal of Economics* 109 (3): 659–684.
- Alves, Felipe, Greg Kaplan, Benjamin Moll and Giovanni L. Violante. 2020. "A Further Look at the Propagation of Monetary Policy Shocks in HANK". *Journal of Money, Credit and Banking* 52, no. S2 (December): 521–559.
- Angeletos, George-Marios, Chen Lian and Christian K. Wolf. 2024. *Can Deficits Finance Them-selves?* Technical report. National Bureau of Economic Research.
- Auclert, Adrien, Bence Bardóczy and Matthew Rognlie. 2021a. "MPCs, MPEs, and multipliers: A trilemma for New Keynesian models". *The Review of Economics and Statistics*, 1–41.
- Auclert, Adrien, Bence Bardóczy, Matthew Rognlie and Ludwig Straub. 2021b. "Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models". *Econometrica* 89 (5): 2375–2408.
- Auclert, Adrien, Hannes Malmberg, Frédéric Martenet and Matthew Rognlie. 2021c. *Demographics, wealth, and global imbalances in the twenty-first century.* Technical report. National Bureau of Economic Research.
- Auclert, Adrien, Matthew Rognlie, Martin Souchier and Ludwig Straub. 2024. *Exchange Rates and Monetary Policy with Heterogeneous Agents: Sizing up the Real Income Channel*. Technical report. National Bureau of Economic Research.
- Auclert, Adrien, Matthew Rognlie and Ludwig Straub. 2020. *Micro jumps, macro humps: Monetary policy and business cycles in an estimated HANK model.* Technical report. National Bureau of Economic Research.
- ——. 2023. "The Intertemporal Keynesian Cross",
- Azzimonti, Marina, Per Krusell, Alisdair McKay and Toshihiko Mukoyama. 2024. "Macroeconomics".
- Bardóczy, Bence, and Joao Guerreiro. 2023. *Unemployment Insurance in Macroeconomic Stabilization with Imperfect Expectations*. Technical report. mimeo.
- Bayer, Christian, Ralph Lütticke, Lien Pham-Dao and Volker Tjaden. 2019. "Precautionary savings, illiquid assets, and the aggregate consequences of shocks to household income risk". Publisher: Wiley Online Library, *Econometrica* 87 (1): 255–290.
- Boppart, Timo, Per Krusell and Kurt Mitman. 2018. "Exploiting MIT shocks in heterogeneousagent economies: the impulse response as a numerical derivative". Publisher: Elsevier, *Journal of Economic Dynamics and Control* 89:68–92.
- Broer, Tobias, Jeppe Druedahl, Karl Harmenberg and Erik Öberg. 2024. "The unemployment-risk channel in business-cycle fluctuations". Publisher: CEPR Discussion Paper No. DP16639,

- Cherrier, Beatrice, Pedro Garcia Duarte and Aurélien Saïdi. 2023. "Household heterogeneity in macroeconomic models: A historical perspective". Publisher: Elsevier, *European Economic Review* 158:104497.
- Davila, Eduardo, and Andreas Schaab. 2023. "Optimal Monetary Policy with Heterogeneous Agents: A Timeless Ramsey Approach". *Available at SSRN 4102028*,
- De Ferra, Sergio, Kurt Mitman and Federica Romei. 2020. "Household heterogeneity and the transmission of foreign shocks". Publisher: Elsevier, *Journal of International Economics* 124:103303.
- De Nardi, Mariacristina, and Giulio Fella. 2017. "Saving and wealth inequality". Publisher: Elsevier, *Review of Economic Dynamics* 26:280–300.
- Druedahl, Jeppe, Søren Hove Ravn, Laura Sunder-Plassmann, Jacob Marott Sundram and Nicolai Waldstrøm. 2024a. "Fiscal Multipliers in Small Open Economies With Heterogeneous Households",
- ——. 2024b. "The Transmission of Foreign Demand Shocks".
- Galí, Jordi. 2015. *Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications.* Princeton University Press.
- Guvenen, Fatih, Gueorgui Kambourov, Burhan Kuruscu, Sergio Ocampo and Daphne Chen. 2023. "Use it or lose it: Efficiency and redistributional effects of wealth taxation". Publisher: Oxford University Press, *The Quarterly Journal of Economics* 138 (2): 835–894.
- Hagedorn, Marcus, Iourii Manovskii and Kurt Mitman. 2019. *The fiscal multiplier*. Technical report. National Bureau of Economic Research.
- Harmenberg, Karl, and Erik Oberg. 2021. "Consumption dynamics under time-varying unemployment risk". Publisher: Elsevier, *Journal of Monetary Economics* 118:350–365.
- Heathcote, Jonathan, Kjetil Storesletten and Giovanni L. Violante. 2009. "Quantitative Macroeconomics with Heterogeneous Households". *Annual Review of Economics* 1, no. 1 (September): 319–354.
- Hubmer, Joachim, Per Krusell and Anthony A. Smith. 2021. "Sources of US Wealth Inequality: Past, Present, and Future". *NBER Macroeconomics Annual* 35 (May): 391–455.
- Kaplan, Greg, Benjamin Moll and Giovanni L. Violante. 2018. "Monetary policy according to HANK". *American Economic Review* 108 (3): 697–743.
- Kaplan, Greg, and Giovanni L. Violante. 2014. "A model of the consumption response to fiscal stimulus payments". Publisher: Wiley-Blackwell, *Econometrica* 82 (4): 1199–1239.
- ———. 2018. "Microeconomic heterogeneity and macroeconomic shocks". Publisher: American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203-2418, *Journal of Economic Perspectives* 32 (3): 167–194.
- ———. 2022. "The Marginal Propensity to Consume in Heterogeneous Agent Models". *Annual Review of Economics* 14, no. 1 (August): 747–775.

- Kirkby, Robert. 2017. "Transition paths for Bewley-Huggett-Aiyagari models: Comparison of some solution algorithms". Publisher: Te Herenga Waka—Victoria University of Wellington,
- Maxted, Peter, David Laibson and Benjamin Moll. 2024. "Present bias amplifies the household balance-sheet channels of macroeconomic policy". Publisher: Oxford University Press, *The Quarterly Journal of Economics*, qjae026.
- McKay, Alisdair, and Ricardo Reis. 2016. "The Role of Automatic Stabilizers in the U.S. Business Cycle". *Econometrica* 84 (1): 141–194.
- McKay, Alisdair, and Christian K. Wolf. 2023. "Optimal Policy Rules in HANK",
- Mian, Atif, Ludwig Straub and Amir Sufi. 2021. "Indebted demand". Publisher: Oxford University Press, *The Quarterly Journal of Economics* 136 (4): 2243–2307.
- Ozkan, Serdar, Joachim Hubmer, Sergio Salgado and Elin Halvorsen. 2023. "Why are the wealthiest so wealthy? A longitudinal empirical investigation". *A Longitudinal Empirical Investigation (March 9, 2023)*,
- Ravn, Morten O., and Vincent Sterk. 2021. "Macroeconomic fluctuations with HANK & SAM: An analytical approach". Publisher: Oxford University Press, *Journal of the European Economic Association* 19 (2): 1162–1202.
- Straub, Ludwig. 2019. "Consumption, savings, and the distribution of permanent income". *Unpublished manuscript, Harvard University*.
- Werning, Iván. 2015. *Incomplete markets and aggregate demand*. Technical report. National Bureau of Economic Research.