

ECON 416 Advanced Macroeconomics

Spring 2017

Course organization

The class meets on Tuesdays and Thursdays from 11:00am to 12:50pm in KGH 1410. The course grade will be based on problem sets, class participation, and a research project.

The research project should include a substantial computational component and be completed by June 7 (Wednesday of finals' week). The project should formulate an applied research question related to one of the topics covered in the class, describe the economic environment/model used to address the question, formulate a strategy for quantifying and computing the model, and include computed results (which can be preliminary). The project should be written up using \LaTeX .

To make this feasible in the allotted time, a recommended (but not required) strategy is to base the project closely on an existing paper with available code. The research question should then lead to an environment which is a variation or extension of the framework used in the existing paper.

Students should discuss the research question they would like to address with the instructors by early May. At this time, the instructors will point students to the relevant literature and possible papers to build on. A first writeup of the research question and a description of the economic environment and computational strategy is due by May 19th. The instructors will provide feedback on the project at this stage.

Contact details

Instructors: Luigi Bocola and Matthias Doepke

The easiest way to get in contact with us is via e-mail:

`luigi.bocola@northwestern.edu`

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Our office hours are by appointment or walk-in if the door is open. A web site for this course will be maintained on Canvas.

Overview

This class covers topics in advanced macroeconomics. The first part of the course (taught by Luigi Bocola) considers topics at the intersection of macroeconomics and finance, such as models of financial intermediation, sovereign debt and default, and currency crises. The second part of the course (taught by Matthias Doepke) focuses on models of household heterogeneity and household decision making, including life-cycle models and models of household bargaining. Numerical methods for analyzing such models will be emphasized, including homework projects that replicate results from well-known recent research papers.

Part 1: This part of the course covers two topics in macroeconomics: models of sovereign debt and defaults and models of financial intermediation. We will spend roughly four classes on each topic. The format of these two “mini” courses will be homogeneous: the first class will introduce the canonical model and discuss some of its properties; the second class will present quantitative implementations, including algorithms employed for computing those models and approaches to bring them to the data; the third and fourth class will discuss applications that have been recently pursued in the literature. There are no required textbooks for this part of the course, most of the readings are based on journal articles or working papers. For the computational part, it is good if you could have access to “Dynamic General Equilibrium Modeling” by Herr and Maussner and “Numerical Methods in Economics” by Judd.

Part 2: The second part of the course covers recent development of modeling the household sector in macroeconomic models. We will consider life-cycle models with rich heterogeneity and multiple sources of risk, models incorporating financial constraints to match heterogeneity in the consumption response to wealth shocks, models incorporating fixed costs of adjustments to account for financially constrained households with high wealth, and models that incorporate dynamic bargaining within the household. A special emphasis this year will be on recent models of the role of household heterogeneity for the transmission of monetary policy. Problem sets will focus on computational methods used to solve models with these features. Readings will be based on journal articles and working papers, and a reading list for this part of the course will be made available shortly.

Preliminary list of topics (Part 1)

The plan is to cover the following topics in order. There might be some adjustments as we proceed, and I will keep you informed. The articles with a "*" are those that I plan to discuss in details in class. It would be good if you could have a look at those before we meet.

Sovereign debt and default

- **Class 1:** The workhorse model of sovereign debt and default

* Aguiar, Mark, and Manuel Amador. "Chapter 11 - Sovereign Debt." In *Handbook of International Economics*, edited by Elhanan Helpman and Kenneth Rogoff Gita Gopinath, 4:647-87. *Handbook of International Economics*. Elsevier, 2014.

Aguiar, Mark, and Gita Gopinath. "Defaultable Debt, Interest Rates and the Current Account." *Journal of International Economics* 69, no. 1 (June 2006): 64-83.

* Arellano, Cristina. "Default Risk and Income Fluctuations in Emerging Economies." *American Economic Review* 98, no. 3 (June 2008): 690-712.

Eaton, Jonathan, and Mark Gersovitz. "Debt with Potential Repudiation: Theoretical and Empirical Analysis." *The Review of Economic Studies* 48, no. 2 (April 1, 1981): 289-309.

- **Class 2:** Bringing the model to the data: numerical solution and calibration

* Aguiar, M., S. Chatterjee, H. Cole, and Z. Stangebye. "Chapter 21 - Quantitative Models of Sovereign Debt Crises." In *Handbook of Macroeconomics*, edited by John B. Taylor and Harald Uhlig, 2:1697-1755. Elsevier, 2016.

* Chatterjee, Satyajit, and Burcu Eyigungor. "Maturity, Indebtedness, and Default Risk." *American Economic Review* 102, no. 6 (May 2012): 2674-99.

* Hatchondo, Juan Carlos, Leonardo Martinez, and Horacio Sapriza. "Quantitative Properties of Sovereign Default Models: Solution Methods Matter." *Review of Economic Dynamics* 13, no. 4 (October 2010): 919-33.

* Herr and Maussner (2009). *Dynamic General Equilibrium Modeling*. Chapter 6

- **Class 3:** The costs of sovereign defaults

Arellano, Cristina, Andrew Atkeson, and Mark Wright. "External and Public Debt Crises." NBER Macroeconomics Annual 30, no. 1 (2016): 191-244.

* Arellano, Cristina, Bocola, Luigi, and Bai, Yan. "Sovereign Default Risk and Firm Heterogeneity", Manuscript, Federal Reserve Bank of Minneapolis, 2017.

Hebert, Benjamin, and Jesse Schreger. "The Costs of Sovereign Default: Evidence from Argentina." Working Paper. National Bureau of Economic Research, May 2016.

Yeyati, Eduardo Levy, and Ugo Panizza. "The Elusive Costs of Sovereign Defaults." Journal of Development Economics 94, no. 1 (January 2011): 95-105.

* Mendoza, Enrique G., and Vivian Z. Yue. "A General Equilibrium Model of Sovereign Default and Business Cycles." The Quarterly Journal of Economics 127, no. 2 (May 1, 2012): 889-946.

Perez, Diego. "Sovereign Debt, Domestic Banks and the Provision of Public Liquidity." Manuscript, New York University, 2015.

- **Class 4:** Efficient risk sharing and sovereign default

Aguiar, Mark, Manuel Amador, and Gita Gopinath. "Investment Cycles and Sovereign Debt Overhang." The Review of Economic Studies 76, no. 1 (2009): 1-31.

Atkeson, Andrew. "International Lending with Moral Hazard and Risk of Repudiation." Econometrica 59, no. 4 (July 1991): 1069.

* Dovis, Alessandro. "Efficient Sovereign Default." Manuscript, University of Pennsylvania, 2016.

* Tsyrennikov, Viktor. "Capital Flows under Moral Hazard." Journal of Monetary Economics, Carnegie-NYU-Rochester Conference, 60, no. 1 (January 2013): 92-108.

- **Bonus class:** Multiple equilibria

Auclert, Adrien, and Matthew Rognlie. "Unique Equilibrium in the Eaton-Gersovitz Model of Sovereign Debt." Journal of Monetary Economics 84 (December 2016): 134-46.

* Bocola, Luigi, and Alessandro Dovis. "Self-Fulfilling Debt Crises: A Quantitative Analysis." National Bureau of Economic Research, September 2016.

Calvo, Guillermo A. "Servicing the Public Debt: The Role of Expectations." The American Economic Review 78, no. 4 (1988): 647-61.

* Cole, Harold L., and Timothy J. Kehoe. "Self-Fulfilling Debt Crises." The Review of Economic Studies 67, no. 1 (2000): 91-116.

Lorenzoni, Guido, and Ivan Werning. "Slow Moving Debt Crises." National Bureau of Economic Research, July 2013.

Financial intermediation in macro

- **Class 1:** A benchmark model

* Gertler, Mark, and Peter Karadi. "A Model of Unconventional Monetary Policy." Journal of Monetary Economics, Carnegie-Rochester Conference Series on Public Policy: The Future of Central Banking April 16-17, 2010, 58, no. 1 (January 2011): 17-34.

Gertler, Mark, and Peter Karadi. "QE 1 vs. 2 vs. 3...: A Framework for Analyzing Large-Scale Asset Purchases as a Monetary Policy Tool." International Journal of Central Banking 9, no. 1 (2013): 5-53.

* Gertler, Mark, and Nobuhiro Kiyotaki. "Chapter 11 - Financial Intermediation and Credit Policy in Business Cycle Analysis." In Handbook of Monetary Economics, edited by Benjamin M. Friedman and Michael Woodford, 3:547-99. Elsevier, 2010.

- **Class 2:** Bringing the model to data: numerical solution and calibration/estimation

* Bocola, Luigi. "The Pass-Through of Sovereign Risk." Journal of Political Economy 124, no. 4 (July 7, 2016): 879-926.

* Judd, Kenneth L., Lilia Maliar, Serguei Maliar, and Rafael Valero. "Smolyak Method for Solving Dynamic Economic Models: Lagrange Interpolation, Anisotropic Grid and Adaptive Domain." Journal of Economic Dynamics and Control 44 (July 2014): 92-123.

- **Class 3:** Intermediary asset pricing

* Adrian, Tobias, Erkki Etula, and Tyler Muir. "Financial Intermediaries and the Cross-Section of Asset Returns." *The Journal of Finance* 69, no. 6 (December 1, 2014): 2557-96.

He, Zhiguo, Bryan Kelly, and Asaf Manela. "Intermediary Asset Pricing: New Evidence from Many Asset Classes." Working Paper. National Bureau of Economic Research, January 2016.

* He, Zhiguo, and Arvind Krishnamurthy. "Intermediary Asset Pricing." *American Economic Review* 103, no. 2 (April 2013): 732-70.

- **Class 4:** Financial intermediation in international macro

* Bocola, Luigi, and Guido Lorenzoni. "A Model of Financial Crises in Open Economies." Working paper. Northwestern University, 2017.

Bruno, Valentina, and Hyun Song Shin. "Cross-Border Banking and Global Liquidity." *The Review of Economic Studies* 82, no. 2 (April 1, 2015): 535-64.

* Gabaix, Xavier, and Matteo Maggiori. "International Liquidity and Exchange Rate Dynamics." *The Quarterly Journal of Economics* 130, no. 3 (August 1, 2015): 1369-1420.

- **Bonus class:** Risk premia and monetary policy

* Atkeson, Andrew, and Patrick J. Kehoe. "On the Need for a New Approach to Analyzing Monetary Policy." Working Paper. National Bureau of Economic Research, August 2008.

Bianchi, Javier, and Saki Bigio. "Banks, Liquidity Management and Monetary Policy." Working Paper. National Bureau of Economic Research, September 2014.

* Cochrane, John. "Macro-Finance." Working Paper. Stanford University, 2017

* Moritz, Lenel. "Safe Assets, Collateralized Lending, and Monetary Economics." Working Paper. Stanford University, 2017

Reading List for Second Part of Course

Overview

The second part of the course covers recent developments in modeling the household sector in macroeconomic models. We will consider life-cycle models with rich heterogeneity and multiple sources of risk, models incorporating financial constraints to match heterogeneity in the consumption response to wealth shocks, models incorporating fixed costs of adjustments to account for financially constrained households with high wealth, and models that incorporate dynamic bargaining within the household and model marriage and divorce. Problem sets will focus on computational methods used to solve models with these features, including projects that replicate results from well-known recent research papers.

Course Topics (Part 2)

Dynamic Bargaining in the Household

Lise, Jeremy, and Shannon Seitz. 2011. Consumption Inequality and Intra-Household Allocations. *Review of Economic Studies* 78:328355.

Lise, Jeremy, and Ken Yamada. 2015. Household Sharing and Commitment: Evidence from Panel Data on Individual Expenditures and Time Use. Unpublished Manuscript, University College London.

Mazzocco, Maurizio. 2007. Household Intertemporal Behaviour: A Collective Characterization and a Test of Commitment. *Review of Economic Studies* 74 (3): 857895.

Mazzocco, Maurizio. 2008. Individual Rather Than Household Euler Equations: Identification and Estimation of Individual Preferences Using Household Data. Unpublished Manuscript, UCLA.

Mazzocco, Maurizio, Claudia Ruiz, and Shintaro Yamaguchi. 2013. Labor Supply, Wealth Dynamics, and Marriage Decisions. Unpublished Manuscript, UCLA.

Mazzocco, Maurizio, Claudia Ruiz, and Shintaro Yamaguchi. 2015. "Labor Supply and Household Dynamics." *American Economic Review: Papers and Proceedings*, Vol. 104, No. 5, pp. 354-359.

Voena, Alessandra. 2015. Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples? *American Economic Review* 105 (8): 22952332.

Fernandez, Raquel, and Joyce Cheng Wong. 2014b. Divorce Risk, Wages and Working Wives: A Quantitative Life-Cycle Analysis of Female Labour Force Participation. *The Economic Journal* 124 (576): 31958.

Fernandez, Raquel, and Joyce Cheng Wong. 2014c. Free to Leave? A Welfare Analysis of Divorce Regimes. Unpublished Manuscript, NYU.

Voena, Alessandra. 2012. "Yours, Mine and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples?" Unpublished manuscript, University of Chicago.

Household Models with Equilibrium Default

Chatterjee, Satyajit, Dean Corbae, Makoto Nakajima, and Jose-Victor Rios-Rull. 2007. "A Quantitative Theory of Unsecured Consumer Credit with Risk of Default." *Econometrica* 75(6):1525–1589.

Livshits, Igor, Jim MacGee, and Michele Tertilt. 2007. "Consumer Bankruptcy—A Fresh Start." *American Economic Review* 97(1): 402–418.

Livshits, Igor, Jim MacGee, and Michele Tertilt. 2010. "Accounting for the Rise in Consumer Bankruptcies." *American Economic Journal: Macroeconomics* 2(2): 165-193.

Livshits, Igor, Jim MacGee, and Michele Tertilt. 2016. "The Democratization of Credit and the Rise in Consumer Bankruptcies." *Review of Economic Studies*, forthcoming.

Mitman, Kurt. 2016. "Macroeconomic Effects of Bankruptcy and Foreclosure Policies." *American Economic Review* 106(8):

Financial Constraints, Heterogeneity in Propensities to Consume, and the Redistributive Effects of Monetary Policy

Auclert, Adrien. 2016. Monetary Policy and the Redistribution Channel.

Doepke, Matthias, and Martin Schneider. 2005. "Aggregate Implications of Wealth Redistribution: The Case of Inflation." *Journal of the European Economic Association* 4(2-3): 493-502.

Doepke, Matthias, and Martin Schneider. 2006. "Inflation and the Redistribution of Nominal Wealth." *Journal of Political Economy* 114(6): 1069-1097.

Doepke, Matthias, Martin Schneider, and Veronika Selezneva. 2016. "Distributional Effects of Monetary Policy." Unpublished Manuscript.

Heathcote, Jonathan. 2005. "Fiscal Policy With Heterogeneous Agents and Incomplete Markets." *Review of Economic Studies*, 72 (1), 161188.

Kaplan, Greg, Benjamin Moll, and Gianluca Violante, Monetary Policy According to HANK, Manuscript, January 2016.

Kaplan, Greg, Gianluca Violante, and Justin Weidner. 2014. "The Wealthy Hand-To-Mouth." *Brookings Papers on Economic Activity*.

Kaplan, Greg, and Gianluca Violante. 2014. A Model of the Consumption Response to Fiscal Stimulus Payments. *Econometrica*, Vol. 82(4), 1199-1239.

Dynamic Models of Fertility and Household Labor Supply

Adda, Jerome, Christian Dustmann, and Katrien Stevens. 2016. "The Career Costs of Children." *Journal of Political Economy*, forthcoming.

Attanasio, Orazio, Hamish Low, and Virginia Sanchez-Marcos. 2008. Explaining Changes in Female Labor Supply in a Life-Cycle Model. *American Economic Review* 98 (4): 1517-52.

Blundell, Richard, Luigi Pistaferri, and Itay Saporta-Eksten. 2016. Consumption Inequality and Family Labor Supply. *American Economic Review* 106 (2): 387-435.

Elizabeth Caucutt, Nezih Guner, and John Knowles. 2002. "Why do Women Wait? Matching, Wage Inequality and Incentives for Fertility Delay." *Review of Economic Dynamics*, 5(4), 815-55.

Matthias Doepke, Moshe Hazan, and Yishay Maoz. 2015. "The Baby Boom and World War II: A Macroeconomic Analysis." *Review of Economic Studies*, 82(3), 1031-1073.

Matthias Doepke and Fabian Kindermann. 2016. "Bargaining over Babies: Theory, Evidence, and Policy Implications". NBER Working Paper 22072.

Eckstein, Zvi, and Osnat Lifshitz. 2011. Dynamic Female Labor Supply. *Econometrica* 79 (6): 1675-1726.

Jeremy Greenwood, Nezih Guner, Georgi Kocharkov and Cezar Santos. 2012. "Technology and the Changing Family: A Unified Model of Marriage, Divorce, Educational Attainment and Married Female Labor-Force Participation," University of Pennsylvania.

Guvenen, Fatih, and Michelle Rendall. 2015. Womens Emancipation through Education: A Macroeconomic Analysis. *Review of Economic Dynamics* 18 (4): 931-956.

Scholz, John Karl, and Ananth Seshadri. 2009. Children and Household Wealth. Unpublished Manuscript, University of Wisconsin.

Not Covered this Year

Life Cycle Models in Macroeconomics

de Nardi, Mariacristina. 2004. Wealth Inequality and Intergenerational Links. *Review of Economic Studies* 71 (3): 747-68.

Xiaodong Fan, Chris Taber and Ananth Seshadri. 2015. "Estimation of a Life-Cycle Model with Human Capital, Labor Supply and Retirement." Unpublished Manuscript, University of Wisconsin.

Fernandez-Villaverde, Jesus, and Dirk Krueger. 2011. Consumption and Saving over the Life Cycle: How Important are Consumer Durables? *Macroeconomic Dynamics* 15 (11): 725770.

Jaimovich, Nir, and Henry E. Siu. 2009. The Young, the Old, and the Restless: Demographic and Business Cycle Volatility. *American Economic Review* 99 (3): 804826.

Kaplan, Greg. 2012. Moving Back Home: Insurance against Labor Market Risk. *Journal of Political Economy* 120 (3): 446512.