

EC 205: Macroeconomic Theory I

Fall Semester

1. Instructor Information

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2. Course Information

The course will have a Teaching Assistant, who will hold weekly recitations. These recitations are meant to (1) go over some of the more technical details behind the material I cover in class, (2) provide more background for the computational projects (see below), and/or (3) go over any questions that you may have about the material. *I strongly encourage you to ask any questions you may have about the material (as simple as you think they may be) during class. Everyone can benefit from these questions!*

3. Course Overview, Objectives, and Methodology

This course provides a broad overview of modern macroeconomic theory with a focus on business cycles and dynamic stochastic general equilibrium (DSGE) models, the macroeconomics of labor markets, and (if time permits) the role of financial frictions in aggregate fluctuations.

Modern macroeconomics relies heavily on quantitative methods to delve deeper into key aspects that we want to understand as macroeconomists and policymakers. As part of the course, I will be introducing basic computational techniques that will enable us to analyze some of the models we cover in a quantitative fashion. Thus, the course will not only cover a good deal of modern macroeconomic theory, but will also let you experience first-hand how to analyze these models beyond pencil and paper. The course will put emphasis on both the economic intuition behind each of the models we study (and will highlight the advantages and limitations of each of the models), as well as some of the more technical aspects of modern applied macroeconomic theory. By the end of the course, students will have a broad perspective of modern macroeconomics as well as a solid grasp of the tools used for both positive and normative analysis of key macroeconomic issues.

The course begins by providing a broad overview of the origins of modern macroeconomics. This sets the stage for introducing the basic modern business cycle framework, the Real Business Cycle (RBC) model. We then build upon this model by exploring several modifications that not only aim to improve the fit of the model with the data (and hence provide a better laboratory to understand aggregate fluctuations and the implications of different frictions), but also to provide more suitable frameworks to explore specific positive and normative questions in macroeconomics. These modifications include the introduction of an extensive margin for labor, nominal rigidities, labor search and matching frictions, and financial imperfections, among others. Throughout the course, we will rely on several seminal papers in the literature as well as papers on the frontier of the field. Along the way, students will be able to get hands-on experience by writing and simulating some of these models in MATLAB through a series of computational projects. No prior knowledge of MATLAB is required. All computational projects will be completed in groups of 2 or 3 students. I find this to be an excellent way for you to learn from each other. The computational projects will not only allow you to review some of the economic intuition highlighted

in class, but will also allow you to learn some of the technical tools used in modern macroeconomic analysis.

Modern macroeconomic theory tends to be fairly technical. As such, a solid grasp of differential calculus and probability theory is very useful. If you feel the need to brush up on some intermediate macroeconomic theory, Stephen Williamson's *Macroeconomics* (2010) or Sanjay Chugh's *Modern Macroeconomics* (forthcoming) are good sources. In general, David Romer's book should be the best source to complement the material we will be covering during the semester (which will be slightly more technical than the chapters in Romer). In general, the minimum requirements for this course are having taken EC 18 or its equivalent (intermediate macroeconomic theory), a course in differential calculus, and a basic probability and statistics course.

4. Grades and Distribution of Grades

The final grade will be determined by a midterm exam, three group computational projects, and a second exam at the end of the semester.

First computational project	(20%)
Second computational project	(20%)
First exam	(25%)
Third computational project	(20%)
Second exam	(15%)

5. Important Dates

First day of classes (university-wide):
First exam: Wednesday October 26
Last day of classes (university-wide): Friday December 11
Second exam: Friday December 18,

6. Tentative Dates for Computational Projects

Note that these are tentative (flexible) dates and will depend on how quickly we go through each of the topics in the course. You will have between 2 and 3 weeks to complete each computational project.

Computational Project 1: Wednesday October 7
Computational Project 2: Wednesday November 4
Computational Project 3: Wednesday November 30

7. Tentative Outline

Note: these dates are subject to change depending on our progress during the semester. **Important note:** there are no classes on Wednesday November 11. As such, Tuesday November 10, follows a Wednesday schedule (so we will meet on that Tuesday).

Month	Day	Lecture
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September	9	Lecture 1: Introduction
September	14	Lecture 2: Dynamic Programming and Markov Chains
September	16	Lecture 3: The RBC Model
September	21	Matlab Lecture
September	23	Lecture 4: Local Approximation Methods
September	28	Dynare Lecture
September	30	Lecture 5: DSGE Models with Indivisible Labor
October	5	Lecture 6: DSGE Models with Money
October	7	Lecture 7: DSGE with Monopolistic Competition
October	12	Lecture 8: DSGE Models with Nominal Rigidities
October	14	Lecture 9: DSGE Models with Nominal Rigidities
October	19	Lecture 10: Medium-Scale DSGE Models
October	21	Review Session
October	26	Exam 1
October	28	Lecture 11: Introduction to Labor Markets
November	2	Lecture 12: Search Models of the Labor Market
November	4	Lecture 13: Search Models of the Labor Market
November	9	Lecture 14: The Cyclical Behavior of Labor Markets
November	10	Lecture 15: DSGE Models with Search Frictions
November	16	Lecture 16: On-the-Job Search and Participation
November	18	Lecture 17: Labor Market Structures
November	23	Lecture 18: Labor Market Structures
November	30	Lecture 19: DSGE Models with Financial Frictions
December	2	Lecture 20: Models with Financial, Labor Frictions
December	7	Lecture 21 (TBD)
December	9	Review Session

8. References

The course will rely heavily on published or working papers. David Romer's *Advanced Macroeconomics* is our reference book. It provides a good introduction to some (but not all) of the topics we will cover in class. Please feel free to ask me about any other references that would be more suitable given your background in economics and mathematics. Additional useful textbook references include:

David Romer. *Advanced Macroeconomics*. Fourth Edition, McGraw Hill, 2006. [DR]

Thomas F. Cooley. *Frontiers of Business Cycle Research*, Princeton University Press, 1995.

Carl E Walsh. *Monetary Theory and Policy*, Second Edition, MIT Press, 2003.

Woodford Michael. *Interests and Prices: Foundations of a Theory of Monetary Policy*, First Edition, Princeton University Press, 2003.

Jordi Gali. *Monetary Policy, Inflation and the Business Cycle: An Introduction to the New Keynesian Framework*. Princeton University Press, 2008.

Other sources that have more advanced material include:

Christopher A. Pissarides. *Equilibrium Unemployment Theory*, Second Edition, MIT Press, 2000.

Robert Shimer. *Labor Markets and Business Cycles*, Princeton University Press, 2010.

Sargent, Thomas J. y Lars Ljungqvist. *Recursive Macroeconomic Theory*. Segunda edición. MIT Press, 2004.

Nancy L. Stokey and Robert E. Lucas Jr., with Edward C. Prescott. *Recursive Methods in Economic Dynamics*, Harvard University Press, 1989.

The following list of papers is much longer relative to what we can cover in this course. I am explicitly including additional papers under each topic for those of you who are interested in exploring specific topics in more detail. Most (but not all) of the papers marked with a * will be covered in class. I will let you know which papers you have to read for class in advance as we move along. All papers should be available online (either through the journal websites, or on the authors' websites). You should have access to all online published papers through the Tisch Library website.

A Debate over Modern Macroeconomics and the Agenda Forward (Lecture 1)

*Prescott, Edward C. 2006. "Nobel Lecture: The Transformation of Macroeconomic Policy and Research." *Journal of Political Economy*, Vol. 114, pp. 203-235.

*Mankiw, N. Gregory. 2006. "The Macroeconomist as Scientist and Engineer." *Journal of Economic Perspectives*, Vol. 20, pp. 29-46.

Akerlof, George A. 2007. "The Missing Motivation in Macroeconomics." *American Economic Review*, Vol. 97, pp. 5-36.

*Caballero, Ricardo. 2010. "Macroeconomics after the Crisis: Time to Deal with the Pretense-of-Knowledge Syndrome." *Journal of Economic Perspectives*, Vol. 24, Fall 2010, pp. 85-102.

Ohanian, Lee E. 2010. "The Economic Crisis from a Neoclassical Perspective." *Journal of Economic Perspectives*, Vol. 24, Fall 2010, pp. 45-66.

Blanchard, Olivier J. 2008. "The State of Macro." *NBER Working Paper No. 14259*.

Kydland, Finn E. 2006. "Nobel Lecture: Quantitative Aggregate Economics." *American Economic Review*, Vol. 96, pp. 1373-1383.

Chari, V.V. and Patrick J. Kehoe. 2006. "Modern Macroeconomics in Practice: How Theory is Shaping Policy." *Journal of Economic Perspectives*, Vol. 20, pp. 3-28.

Rebelo, Sergio T. 2005. "Real Business Cycle Models: Past, Present, and Future." *NBER Working Paper No. 11401*.

Hall, Robert E. 2010. "Why Does the Economy Fall to Pieces After a Financial Crisis?" *Journal of Economic Perspectives*, Vol. 24, Fall 2010, pp. 3-20.

Woodford, Michael. 2010. "Financial Intermediation and Macroeconomic Analysis," *Journal of Economic Perspectives*, Vol. 24, Fall 2010, pp. 21-44.

Real Business Cycles (Lectures 2 and 3)

*Christiano, Lawrence, Martin Eichenbaum, and Robert Vigfusson. 2004. "What Happens After A Technology Shock?" *mimeo*.

*[DR] Chapter 5.

King, Robert G. and Sergio T. Rebelo. 1999. "Resuscitating Real Business Cycle," In *Handbook of Macroeconomics*, Vol. 1B, edited by John B. Taylor and Michael Woodford.

McGrattan, Ellen R. 2006. "Real Business Cycles," *Federal Reserve Bank of Minneapolis Staff Report No. 370*.

Dynamic Programming and Basic Computational Methods (Lecture 4)

*Schmitt-Grohé, Stephanie and Martin Uribe. 2004. "Solving Dynamic General Equilibrium Models Using a Second-Order Approximation to the Policy Function," *Journal of Economic Dynamics and Control*, Vol. 28, pp. 755-775.

Aruoba, S. Boragan, Jesus Fernandez-Villaverde, and Juan F. Rubio-Ramirez. 2006. "Comparing Solution Methods for Dynamic Equilibrium Economies," *Journal of Economic Dynamics and Control*, Vol. 30, pp. 2477-2508.

Prescott, Edward C. and Rajnish Mehra. 1980. "Recursive Competitive Equilibrium: The Case of Homogeneous Households," *Econometrica*, Vol. 48, pp. 1365-1379.

Ljungqvist and Sargent, Chapter 1.4, Chapter 2.2, Chapter 3, 4 (obligatorio para alumnos de doctorado)

Uhlig, Harald. 1999. "A Toolkit for Analyzing Nonlinear Dynamic Stochastic Models Easily," In *Computational Methods for the Study of Dynamic Economies*, edited by Ramon Marimon and Andrew Scott. Oxford Press.

Quantitative Macroeconomic Models: Introducing Employment and Money (Lectures 5 and 6)

*Rogerson, Richard. 1988. "Indivisible Labor, Lotteries and Equilibrium," *Journal of Monetary Economics*, Vol. 21, pp. 3-16.

*Cho, Jang-Ok and Thomas F. Cooley. 1994. "Employment and Hours Over the Business Cycle," *Journal of Economic Dynamics and Control*, Vol. 18, pp. 411-432.

*Cooley, Thomas F. and Gary D. Hansen. 1991. "The Welfare Costs of Moderate Inflation," *Journal of Money, Credit, and Banking*, Vol. 23, pp. 483-503.

Hansen, Gary D. 1985. "Indivisible Labor and the Business Cycle," *Journal of Monetary Economics*, Vol. 16, pp. 309-327.

Cooley, Thomas F. and Gary D. Hansen. 1989. "The Inflation Tax in a Real Business Cycle Model," *American Economic Review*, Vol. 79, pp. 733-748.

Cooley, Thomas F. and Gary D. Hansen. 1995. "Money and the Business Cycle," In *Frontiers of Business Cycle Research*, edited by Thomas F. Cooley. Princeton University Press.

Chetty, Raj, Adam Guren, Day Manoli, and Andrea Weber. 2012. "Does Indivisible Labor Explain the Difference between Micro and Macro Elasticities? A Meta-Analysis of Extensive Margin Elasticities," forthcoming *NBER Macroeconomics Annual 2012*.

Quantitative Macroeconomic Models: Monopolistic Competition and Nominal Rigidities (Lectures 7, 8, and 9)

*Jaimovich, Nir. 2007. "Firm Dynamics and Markup Variations: Implications for Sunspot Equilibria and Endogenous Economic Fluctuations," *Journal of Economic Theory*, Vol. 137, pp. 300-325.

*Yun, Tack. 1996. "Nominal Price Rigidity, Money Supply Endogeneity, and Business Cycles," *Journal of Monetary Economics*, Vol. 37, pp. 345-370.

*[DR] Chapters 6 and 7.

Bils, Mark and Peter J. Klenow. 2004. "Some Evidence on the Importance of Sticky Prices." *Journal of Political Economy*, Vol. 112, pp. 947-985.

Rotemberg, Julio J., and Michael Woodford. 1999. "The Cyclical Behavior of Prices and Costs," *NBER Working Paper 6909*.

Rotemberg, Julio J. and Michael Woodford. 1995. "Dynamic General Equilibrium Models with Imperfectly Competitive Product Markets," In *Frontiers of Business Cycle Research*, edited by Thomas F. Cooley. Princeton University Press.

Kimball, Miles S. 1995. "The Quantitative Analytics of the Basic Neomonetarist Model," *Journal of Money, Credit, and Banking*, Vol. 27, pp. 1241-1277.

Calvo, Guillermo A. 1983. "Staggered Prices in a Utility-Maximizing Framework," *Journal of Monetary Economics*, Vol. 12, pp. 383-398.

Chari, V.V., Patrick J. Kehoe, and Ellen R. McGrattan. 2000. "Sticky Price Models of the Business Cycle: Can the Contract Multiplier Solve the Persistence Problem?" *Econometrica*, Vol. 68, pp. 1151-1179.

Gali, Jordi and Mark Gertler. 2007. "Macroeconomic Modeling for Monetary Policy Evaluation," *Journal of Economic Perspectives*, Vol. 21, pp. 25-45.

Gagnon, Étienne. 2009. "Price Setting During Low and High Inflation: Evidence from Mexico," *Quarterly Journal of Economics*, Vol. 124, No. 3, pp. 1221-1263.

Mankiw, N. G. and R. Reis (2002), "Sticky Information versus Sticky Prices: A Proposal to Replace the New Keynesian Phillips Curve," *Quarterly Journal of Economics*, November, pp. 1295-1328.

Blanchard, Olivier J. and Nobuhiro Kiyotaki. 1987. "Monopolistic Competition and the Effects of Aggregate Demand," *American Economic Review*, Vol. 77, pp. 647-666.

Mankiw, N. Gregory. 1985. "Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly," *Quarterly Journal of Economics*, Vol. 100, pp. 529-538.

Taylor, John B. 1980. "Aggregate Dynamics and Staggered Contracts," *Journal of Political Economy*, Vol. 88, pp. 1-23.

Rotemberg, Julio J. 1982. "Sticky Prices in the United States," *Journal of Political Economy*, Vol. 90, pp. 1187-1211.

Taylor, John B. 1999. "Staggered Price and Wage Setting in Macroeconomics," In *Handbook of Macroeconomics*, Vol. 1B, edited by John B. Taylor and Michael Woodford.

Basu, Susanto and John G. Fernald. 1997. "Returns to Scale in U.S. Production: Estimates and Implications," *Journal of Political Economy*, Vol. 105, pp. 249-283.

Steinsson y Nakamura (2008) "Five Facts about Prices: A Reevaluation of Menu Cost Models," *Quarterly Journal of Economics*, Vol. 123 (4): 1415-1464.

Klenow, Peter J., Benjamin A. Malin 2010. "Microeconomic Evidence on Price-Setting," *NBER Working Paper 15826*.

Dhyne, Emmanuel, Luis J. Álvarez, Hervé Le Bihan, Giovanni Veronese, Daniel Dias, Johannes Hoffman, Nicole Jonker, Patrick Lünemann, Fabio Rumler and Jouko Vilmunen. 2005. "Price Setting in the Euro Area. Some Stylized Facts from Individual Consumer Price Data", *ECB Working Paper Series No.524*. 25.

Klenow, Peter J., and Oleksiy Kryvtsov. 2008. "State-Dependent or Time-Dependent Pricing: Does it Matter for Recent U.S. Inflation?" *Quarterly Journal of Economics*, Vol. 123, Issue 3, pp. 863-904.

Quantitative Macroeconomic Models: Medium-Scale Models (Lecture 10)

*Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans. 2005. "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy," *Journal of Political Economy*, Vol. 113, pp. 1-45.

Chari, V.V., Patrick J. Kehoe, and Ellen R. McGrattan. 2007. "Business Cycle Accounting," *Econometrica*, Vol. 75, pp. 781-836.

Smets, Frank and Rafael Wouters. 2003. "An Estimated Stochastic Dynamic General Equilibrium Model of the Euro Area," *Journal of the European Economic Association*, Vol. 1, pp. 1123-1175.

Smets, Frank and Rafael Wouters. 2007. "Shocks and Frictions in U.S. Business Cycles," *American Economic Review*, Vol. 97, pp. 586-606.

Unemployment and Search Frictions (Lectures 11 through 16)

*Davis, Steven J., R. Jason Faberman, and John Haltiwanger. 2006. "The Flow Approach to Labor Markets: New Data Sources and Micro-Macro Links," *Journal of Economic Perspectives*, Vol. 20, No. 3, pp. 3-26.

*Albrecht, James. 2011. "The 2010 Nobel Memorial Prize in Search Theory," *Scandinavian Journal of Economics* Vol. 113, Issue 2, pp. 237-259.

*Shimer, Robert. 2005. "The Cyclical Behavior of Equilibrium Unemployment and Vacancies," *American Economic Review*, Vol. 95, pp. 25-49.

*Andolfatto, David. 1996. "Business Cycles and Labor Market Search," *American Economic Review*, Vol. 86, pp. 112-132.

*Krause, Michael U., and Thomas A. Lubik. 2006. "The Cyclical Upgrading of Labor and On-the-Job Search," *Labour Economics*, Vol. 13, pp. 459-477.

*Tuzemen, Didem. 2014. "Labor Market Dynamics with Endogenous Labor Force Participation and On-the-Job Search," *Federal Reserve Bank of Kansas City Research Working Paper RWP 12-07*.

*[DR] Chapters 10.

Den Haan, Wouter J., Garey Ramey, and Joel Watson. 2000. "Job Destruction and Propagation of Shocks," *American Economic Review*, Vol. 90, pp. 482-498.

Hagedorn, Marcus and Iourii Manovskii. 2008. "The Cyclical Behavior of Equilibrium Unemployment and Vacancies Revisited," *American Economic Review*, Vol. 98, p. 1692-1706.

Rogerson, Richard, Robert Shimer, and Randall Wright. 2005. "Search-Theoretic Models of the Labor Market: A Survey," *Journal of Economic Literature*, Vol. 43, pp. 959-988.

Amaral, Pedro S., and Murat Tasci. 2012. "The Cyclical Behavior of Equilibrium Unemployment and Vacancies across OECD Countries," *Federal Reserve Bank of Cleveland Working Paper 12-36*.

Hobijn, Bart, and Aysegul Sahin. 2012. "Beveridge Curve Shifts across Countries since the Great Depression," *13th Jacques Polak Annual Research Conference, Nov. 8-9 2012*.

Shimer, Robert. 2012. "Reassessing the Ins and Outs of Unemployment," *Review of Economic Dynamics*, Vol. 15, Issue 2, pp. 127-148.

Fujita, Shigeru, and Garey Ramey. 2007. "Reassessing the Shimer Facts," *Working Papers 07-2*, Federal Reserve Bank of Philadelphia.

Hall, Robert E. 2005. "Equilibrium Wage Stickiness," *American Economic Review*, Vol. 95, pp. 50-65.

Merz, Monika. 1995. "Search in the Labor Market and the Real Business Cycle," *Journal of Monetary Economics*, Vol. 36, pp. 269-300.

Gertler, Mark and Antonella Trigari. 2009. "Unemployment Fluctuations with Staggered Nash Bargaining," *Journal of Political Economy*, Vol. 117, p. 38-86.

Pissarides, Christopher A. 2000. *Equilibrium Unemployment Theory*. MIT Press.

Chugh, Sanjay K. and Christian Merkl. 2012. "Efficiency and Labor Market Dynamics in a Model of Labor Selection," mimeo.

Krusell, Per, Toshihiko Mukoyama, and Aysegul Sahin. 2010. "Labour-Market Matching with Precautionary Savings and Aggregate Fluctuations," *Review of Economic Studies*, Vol. 77, p. 1477-1507.

Shapiro, Carl and Joseph Stiglitz. 1984. "Equilibrium Unemployment as a Worker Discipline Device," *American Economic Review*, Vol. 74, No. 3, pp. 433-444.

Diamond Peter. 2011. "Unemployment, Vacancies, Wages," *American Economic Review*, Vol. 101(4), pp. 1045-1072.

Mortensen, Dale T. 2011. "Markets with Search Friction and the DMP Model," *American Economic Review*, Vol. 101(4), pp. 1073-1091.

Pissarides, Christopher A. 2011. "Equilibrium in the Labor Market with Search Frictions," *American Economic Review*, Vol. 101(4), pp. 1092-1105.

Krause, Michael U., and Thomas A. Lubik. 2010. "On-the-Job Search and the Dynamics of the Labor Market," *Federal Reserve Bank of Richmond Working Paper No. 10-12*.

Pilossoph, Laura. 2014. "A Multisector Equilibrium Search Model of Labor Reallocation," *mimeo*.

Yashiv, Eran. 2007. "Labor Search and Matching in Macroeconomics," *IZA Discussion Series No. 2743*.

Search and Matching Models beyond Advanced Economies (Lectures 17 and 18)

*Bosch, Mariano and William F. Maloney. 2008. "Cyclical Movements in Unemployment and Informality in Developing Countries," *IZA Discussion Papers 3514*, Institute for the Study of Labor (IZA).

*Bosch, Mariano and Julen Esteban-Pretel. 2012. "Job Creation and Job Destruction in the Presence of Informal Markets," *Journal of Development Economics*, Vol. 98(2), pp. 270-286.

*Finkelstein Shapiro, Alan. 2014. "Self-Employment and Business Cycle Persistence: Does the Composition of Employment Matter for Economic Recoveries?" *Journal of Economic Dynamics and Control*, September 2014, Vol., pp. 200-218.

Bosch, Mariano and William F. Maloney. 2010. "Comparative Analysis of Labor Market Dynamics Using Markov Processes: An Application to Informality," *Labour Economics*, Vol. 17(4), pp. 621-631.

Financial Frictions and Business Cycles (Lectures 19 and 20)

*Jermann, Urban, and Vincenzo Quadrini. 2012. "Macroeconomic Effects of Financial Shocks," *American Economic Review*, Vol. 102, No. 1, pp. 238-271.

*Chugh, Sanjay K. 2013. "Costly External Finance and Labor Market Dynamics," *Journal of Economic Dynamics and Control*, 2013. Vol. 37, pp. 2882-2912.

Iacoviello, Matteo. 2015. "Financial Business Cycles," *Review of Economic Dynamics*, Vol. 18, Issue 1, pp. 140-163.

Epstein, Brendan, Alan Finkelstein Shapiro, and Andrés González Gómez. 2015. "Underemployment and the Recovery from Financial Disruptions," *mimeo*.

Brzoza-Brzezina, Michał, Marcin Kolasa, and Krzysztof Makarski. 2013. "The Anatomy of Standard DSGE Models with Financial Frictions," *Journal of Economic Dynamics and Control*, Vol. 37, Issue 1, pp. 32-51.

Guerrieri, Luca, Matteo Iacoviello, Francisco B. Covas, John C. Driscoll, Michael T. Kiley, Mohammad Jahan-Parvar, Albert Queralto Olive, and Jae W. Sim. "Macroeconomic Effects of Banking Sector Losses across Structural Models," Finance and Economics Discussion Series 2015-044. Washington: Board of Governors of the Federal Reserve System, <http://dx.doi.org/10.17016/FEDS.2015.044>

Bernanke, Ben, Mark Gertler, and Simon Gilchrist. 1999. "The Financial Accelerator in a Quantitative Business Cycle Framework," in *Handbook of Macroeconomics*, Vol. 1, Part C, pp. 1341-1393.

Carlstrom, Charles T. and Timothy S. Fuerst. 1997. "Agency Costs, Net Worth, and Business Fluctuations: A Computable General Equilibrium Analysis," *American Economic Review*, Vol. 87, pp. 893-910.

Petrosky-Nadeau, Nicolas. 2013. "TFP During a Credit Crunch," *Journal of Economic Theory*, Vol. 148, No. 3.

den Haan, Wouter, Garey Ramey, and Joel Watson. 2003. "Liquidity Flows and the Fragility of Business Enterprises," *Journal of Monetary Economics*, Vol. 50, Issue 6, pp. 1215-1241.

Petrosky-Nadeau, Nicolas. 2014. "Credit, Vacancies and Unemployment Fluctuations," *Review of Economic Dynamics*, Vol. 17, No. 2.

Petrosky-Nadeau, Nicolas, and Etienne Wasmer. 2013. "The Cyclical Volatility of Labor Markets under Frictional Financial Markets," *American Economic Journal: Macroeconomics*, Vol. 5, No. 1.

Monetary Policy and Unemployment (not covered in this course)

Ravenna, Federico and Carl Walsh. 2011. "Welfare-Based Optimal Monetary Policy with Unemployment and Sticky Prices: A Linear-Quadratic Framework," *American Economic Journals: Macroeconomics*, Vol. 3, pp. 130-162.

Galí, Jordi. 2011. "Monetary Policy and Unemployment," In *Handbook of Monetary Economics*, Vol. 3B, edited by Benjamin M. Friedman and Michael Woodford.

Blanchard, Olivier and Jordi Galí. 2010. "Labor Markets and Monetary Policy: A New Keynesian Model with Unemployment," *American Economic Journals: Macroeconomics*, Vol. 2, pp. 1-30.