

2020 SiDE Summer School of Econometrics

University Residential Center, Bertinoro (Forlì-Cesena, Italy)

Week #1

“Empirical Methods in Monetary Economics”

James Cloyne¹ and Òscar Jordà^{1,2}

¹ **University of California, Davis**

² **Federal Reserve Bank of San Francisco**

Dates: from July 20th through July 25th, 2020

Syllabus

Course description: This course will cover the modern tools used to study to macroeconomic policy in monetary economics. The course will cover a range of time-series methods, seminal and research papers in the monetary economic literature and some hands-on practical examples. Broadly we plan to cover the following topics, time permitting.

Topics covered

1. Estimating the empirical effects of monetary policy: an introduction to Vector Autoregression techniques, including both theory and applications of VAR methods in monetary economics. We will also cover the local projections technique that is now widely used in this field.
2. More recent techniques to estimating the effects of monetary policy, including using historical “narrative” based methods and approaches using high frequency information from financial markets.
3. The monetary transmission mechanism in theory and in practice. We will cover how to set-up and estimate Dynamic Stochastic General Equilibrium models for policy analysis. This will include minimum distance estimation of DSGE models using impulse response matching, an introduction to state-space models and the Kalman filter, maximum likelihood estimation of DSGE models, an introduction to Bayesian econometrics and Bayesian estimation of DSGE models.
4. Bayesian VARs: theory and applications.
5. What can we learn about how policy works from micro data and micro-econometric methods? We will discuss how recent research has started to make use of micro-econometric methods in monetary economics and study some recent examples.

Topic 1

Introduction to Vector Autoregressions

Hamilton, James D. 1994. *Time Series Analysis*. Princeton University Press.

Kilian, Lutz and Helmut Lütkepohl. 2017. *Structural Vector Autoregressive Analysis*. Cambridge University Press.

Lütkepohl, Helmut. 2013. *Introduction to Multiple Time Series Analysis*. Springer Science & Business Media.

Local Projections

Jordà, Òscar. 2005. Estimation and Inference of Impulse Responses by Local Projections. *American Economic Review*, 95(1): 161—182.

Plagborg-Møller, Mikkel and Christian K. Wolf. 2018. Princeton University working paper.

Stock, James H. and Mark W. Watson. 2017. Identification and Estimation of Dynamic Causal Effects in Macroeconomics. *The Economic Journal*, 128(610): 917—948.

Estimating the Effects of Monetary Policy Using Vector Autoregressions

Sims, Christopher 2011 “Statistical Modeling of Monetary Policy and its Effects”, Nobel Prize Lecture. (http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2011/sims-lecture.html)

Ramey, Valerie (2016), “Macroeconomic Shocks and Their Propagation” in *Handbook of Macroeconomics*, Volume 2A Chapter 2. Sections 1-3. ed. John Taylor and Harald Uhlig, 2016.

Christiano, L. and M. Eichenbaum and C. L. Evans, “What Have We Learned and To What End?” in *Handbook of Macroeconomics*, ed. Michael Woodford and John D. Taylor, 1999.

Topic 2

Estimating the Effects of Monetary Policy: Recent Developments

Ramey, Valerie (2016), “Macroeconomic Shocks and Their Propagation” in *Handbook of Macroeconomics*, Volume 2A Chapter 2. Sections 1-3. ed. John Taylor and Harald Uhlig, 2016.

Christiano, L. and M. Eichenbaum and C. L. Evans, "What Have We Learned and To What End?" in *Handbook of Macroeconomics*, ed. Michael Woodford and John D. Taylor, 1999.

Romer, Christina D., and David H. Romer, "A New Measure of Monetary Policy Shocks: Derivation and Implications," *American Economic Review*, 94(4) (September 2004): 1055-84.

Gertler, Mark and Peter Karadi (2015) "Monetary Policy Surprises, Credit Costs, and Economic Activity," *American Economic Journal: Macroeconomics*, 7(1) (January) 44–76.

Tenreyro, Silvana and Gregory Thwaites (2016) "Pushing on a String: US Monetary Policy Is Less Powerful in Recessions." *American Economic Journal: Macroeconomics*, 8(4): 43-74.

Emi Nakamura, Jón Steinsson (2018) "High-Frequency Identification of Monetary Non-Neutrality: The Information Effect" *The Quarterly Journal of Economics*, Volume 133, Issue 3, 1 August 2018

Topic 3

State Space Methods

Hamilton, James D. 1994. State-Space Models. Chapter 50. In *Handbook of Econometrics*, v. 4, Robert F. Engle and Daniel L. McFadden (eds.). North-Holland, Elsevier.

Harvey, Andrew C. 1989. *Forecasting Structural Time Series Models and the Kalman Filter*. Cambridge University Press.

Bayesian Econometrics

Baumeister, Christiane and James D. Hamilton. 2015. Sign Restrictions, Structural Vector Autoregressions, and Useful Prior Information. *Econometrica*, 86(2): 685—720.

Canova, Fabio. 2007. *Methods for Applied Macroeconomic Research*. Princeton University Press.

Gelman, Andrew, John B. Carlin, Hal S. Stern, and Donald B. Rubin. 2013. *Bayesian Data Analysis*. Chapman & Hall/CRC Texts in Statistical Science.

Koop, Gary. 2003. *Bayesian Econometrics*. John Wiley & Sons.

Herbst, Edward and Frank Schorfheide. 2015. *Bayesian Estimation of DSGE Models*. Princeton University Press.

Geweke, John. 2005. *Contemporary Bayesian Econometrics and Statistics*. John Wiley & Sons.

The Monetary Transmission Mechanism: Theory and Model Estimation

Gali, Jordi *Monetary Policy, Inflation and the Business Cycle* (2015), Chapter 3

Christiano, Lawrence J, Martin Eichenbaum, Charles L. Evans, “Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy,” *Journal of Political Economy*, Vol. 113, No. 1, February 2005.

Smets, Frank, and Rafael Wouters. 2007. "Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach." *American Economic Review*, 97(3): 586-606.

Boivin, Jean, Michael T. Kiley, and Frederick S. Mishkin, “How Has the Monetary Transmission Mechanism Evolved Over Time?” *Handbook of Monetary Economics*. 2010.

Topic 5

Monetary Macro with Micro Data

(These are examples, we will only cover one or two)

Di Maggio, Marco, Amir Kermani, Benjamin J. Keys, Tomasz Piskorski, Rodney Ramcharan, Amit Seru, and Vincent Yao. 2017. "Interest Rate Pass-Through: Mortgage Rates, Household Consumption, and Voluntary Deleveraging." *American Economic Review*, 107(11): 3550-88

Cloyne, James, Clodomiro Ferreira, Maren Fromel, Paolo Surico (2018) “Monetary Policy, Corporate Finance and Investment”, NBER Working Paper 25366

Beraja, Martin and Andreas Fuster, Erik Hurst, Joseph Vavra (2019) “Regional Heterogeneity and the Refinancing Channel of Monetary Policy” *The Quarterly Journal of Economics*, Volume 134, Issue 1

Best, Michael, James Cloyne, Ethan Ilzetzki and Henrik Kleven (2019) “Estimating the Elasticity of Intertemporal Substitution Using Mortgage Notches”, *Review of Economic Studies*, forthcoming.

Luck, Stephan and Zimmermann, Tom (2019) “Employment effects of unconventional monetary policy: Evidence from QE” *Journal of Financial Economics*, forthcoming

Cloyne, James, Clodomiro Ferreria and Paolo Surico (2020) “Monetary Policy When Households Have Debt: New Evidence on the Transmission Mechanism”, *Review of Economic Studies*, Vol 87(1), January 2020.

Other References

Angrist, Joshua D., Òscar Jordà & Guido M. Kuersteiner (2018) Semiparametric Estimates of Monetary Policy Effects: String Theory Revisited, *Journal of Business & Economic Statistics*, 36:3, 371-387, DOI: 10.1080/07350015.2016.1204919

Jordà, Òscar, Moritz Schularick, Alan M. Taylor, The effects of quasi-random monetary experiments, *Journal of Monetary Economics*, 2019, <https://doi.org/10.1016/j.jmoneco.2019.01.021>

Òscar Jordà, Moritz Schularick, Alan M. Taylor, Macrofinancial history and the new business cycle facts. *NBER Macroeconomics Annual* 2016, v. 31

Cloyne, James, Kilian Huber, Ethan Ilzetzki, and Henrik Kleven. 2019. "The Effect of House Prices on Household Borrowing: A New Approach." *American Economic Review*, 109 (6): 2104-36. DOI: 10.1257/aer.20180086

Lena Boneva, James Cloyne, Martin Weale, Tomasz Wieladek, Firms' Price, Cost and Activity Expectations: Evidence from Micro Data, *The Economic Journal*, , uez059, <https://doi.org/10.1093/ej/uez059>