

Topics in Macroeconomics I

2022-2023 Academic Year

Master of Research in Economics, Finance and Management

1. Description of the subject

- Advanced Techniques in Macroeconomics II
- Total credits: 3 ECTS Workload: 75 hours
- Term: 1st
- Type of subject: Optative
- Department of Economics and Business
- Teaching team: Barbara Rossi (TA assistant: TBA)

- **Please note: some of the information in this syllabus and its activities depend on the evolution of the COVID-19 pandemic.**

2. Teaching guide

• Introduction

This course examines the models and econometric techniques used to study time series data with a special emphasis to applications in macroeconomics.

The course has three specific objectives. The first is to equip students with the tools they need for empirical research on monetary and fiscal policy as well as forecasting. The second objective is to lay out the econometric theory used in estimating the effects of economic policies, with an emphasis on recent developments. The third objective is to analyze selected recent empirical works. The class is organized as follows:

1. Overview of econometric techniques to estimate the effects of economic policies
2. Selected works on monetary policy: identification, estimation and empirical results
3. Selected works on fiscal policy: identification, estimation and empirical results

This course (Topics in Macroeconomics I) plus the Advanced techniques in Macroeconomics I course are, together, the same course I taught in the past at UPF; by taking both, a student would take the Advanced Time Series class I offered in the past. The difference between the Topics class and the Advanced Techniques class that I am teaching this term is that the Topics class is *more applied*, with an emphasis of some recent developments in VARs and Local Projections, while the Advanced Techniques class is a class covering several *fundamental tools* in time series analysis that anyone working with time series data should be familiar with. I would recommend any student interested in working with time series data in his/her PhD to take both classes.

Pre-requisites: The course builds and extends “Advanced Econometric Methods I, II and III”, which are therefore pre-requisites. Alternatively, students should obtain the Professor’s special permission to take the course.

The course meets regularly on **Mondays and Wednesdays, 8:30-10:30 am, in room TBA**. Attendance to class is mandatory. A few classes may need to be re-scheduled, the changes will be announced in class. When needed, some lectures will be rescheduled **on a day/time TBA**.

My email is: barbara.rossi@upf.edu and my office is Jaume I (building 20), n. 207. My office hours will be on Monday morning, from **10:30 to 11:30**. The TA for the class is Jiaming Huang and the TA’s email is: jiaming.huang@upf.edu. **TA sessions are scheduled on TBA in room TBA.**

The course grade is based 40% on midterm, 50% on final and 10% on problem sets and presentations.

General references:

Hamilton, J., 1994. Time series econometrics. Princeton: Princeton University Press.

Kilian and Lutkepohl, 2018. Structural VAR Analysis, Cambridge

Hayashi, F., 2000. Econometrics. Princeton: Princeton University Press.

Important: this syllabus is preliminary and the contents of the course may change during the semester; in particular, some of the discussion papers might be updated later on –please come to classes to keep up with the contents! Also, it is very comprehensive, not all papers/topics may be discussed in class.

Also important: the department offers an Econometrics Seminar as well as the Barcelona GSE Time Series Summer Forum, both of which are open to students, and complement the course with frontier research on the topics. Attendance is strongly recommended. These activities are really part of the course and will help you integrate with the research done in the time-series / applied macro literature! And they will be fun!

Short presentations by students:

One of the objectives of the class is to teach students to critically read and understand papers, both theoretical and applied. We will devote some time each week to your reading and presentation of papers related to the course. On Tuesdays, all students should come with 5 slides prepared on a paper I will select, and be prepared to discuss the following 5 points (one per slide):

1. Background: what did the previous related literature do?
2. What is the main contribution of this paper and why does it advance the literature in 1?
- 3-4. Main results, findings (both theoretical and empirical) – include intuition
5. Your thoughts: criticisms, improvements, open questions, etc.

One student will be randomly picked for presentation. Be prepared to answer questions.

● Contents

LIST OF TOPICS

a. Investigating the effects of policy shocks

- Ramey, V., 2011. Identifying government spending shocks: it's all in the timing. *Quarterly Journal of Economics*, 126(1), pp. 1-50.
- Rossi, B. and Zubairy, S., 2011. What is the importance of monetary and fiscal shocks in explaining U.S. macroeconomic fluctuations? *Journal of Money, Credit and Banking*, 43(6), pp. 1247-70.
- Ramey, V., 2011. Can government purchases stimulate the economy? *Journal of Economic Literature*, 49(3), pp. 673-85.
- Lawrence J. Christiano, Martin Eichenbaum, Charles L. Evans (1999), Chapter 2, Monetary policy shocks: What have we learned and to what end?, *Handbook of Macroeconomics*, Elsevier, Volume 1, Part A, 1999, Pages 65-148.

b. VARs, Impulse response functions, variance decompositions, inference

- Lütkepohl, H., 2005. *New introduction to multiple time series analysis*. New York: Springer. Ch. 3.7.
- Sims, C., 1980. Macroeconomics and reality. *Econometrica*, 48(1), pp. 1-48.

- Stock, J. and Watson, M., 2001. Vector autoregressions. *Journal of Economic Perspectives*, 15(4), pp. 101-15.
- Watson, M. Vector autoregressions and cointegration. In: R.F. Engle and D.L. McFadden, eds. 1994. *Handbook of Econometrics, Volume 4*. Amsterdam: Elsevier-North Holland. Ch. 47.

c. Structural VARs: short-run identification schemes

- Watson, M. Vector autoregressions and cointegration. In: R.F. Engle and D.L. McFadden, eds. 1994. *Handbook of Econometrics, Volume 4*. Amsterdam: Elsevier-North Holland. Ch. 47.
- Lawrence J. Christiano, Martin Eichenbaum, Charles L. Evans (1999), Chapter 2, Monetary policy shocks: What have we learned and to what end?, *Handbook of Macroeconomics*, Elsevier, Volume 1, Part A, 1999, Pages 65-148.
- Rossi, B. (2021), Identifying and Estimating the Effects of Unconventional Monetary Policy in the Data: How to Do It And What Have We Learned?, *Econometrics Journal*

d. Long-run restrictions

- Blanchard, O., and Quah, D., 1989. The dynamic effects of aggregate demand and supply disturbances. *American Economic Review*, 79(4), pp. 655-73.
- Shapiro and Watson (1988), Sources of Business Cycle Fluctuations, *Macroeconomics Annual*, Vol. 3, pp. 111-156.
- Galí, J., 1999. Technology, employment, and the business cycle: do technology shocks explain aggregate fluctuations? *American Economic Review*, 89(1), pp. 249-71.
- King, R., Plosser, C., Stock, J. and Watson, M., 1991. Stochastic trends and economic fluctuations. *American Economic Review*, 81(4), pp. 819-40.
- Pesavento, E. and Rossi, B., 2005. Do technology shocks drive hours up or down? *Macroeconomic Dynamics*, 9(4), pp. 478-88.

e. Other identification procedures

- Wright, J. (2012), What does Monetary Policy do to Long-Term Interest Rates at the Zero Lower Bound?, *Economic Journal*
- Rigobon (2003), Identification through Heteroskedasticity, *The Review of Economics and Statistics* 85- 4, 777-792
- Faust, J., Rogers, J., Swanson, E. and Wright, J., 2003. Identifying the effects of monetary policy shocks on exchange rates using high frequency data. *Journal of the European Economic Association*, 1(5), pp. 1031-57.
- Faust, J., Swanson, E. and Wright, J., 2004. Identifying VARs based on high-frequency futures data. *Journal of Monetary Economics*, 51(6), pp. 1107-31.
- Kenneth N Kuttner, Monetary policy surprises and interest rates: Evidence from the Fed funds futures market, *Journal of Monetary Economics*, Volume 47, Issue 3, 2001, Pages 523-544.
- - Emi Nakamura, Jón Steinsson, High-Frequency Identification of Monetary Non-Neutrality: The Information Effect, *The Quarterly Journal of Economics*, Volume 133, Issue 3, August 2018, Pages 1283–1330
- Hoesch, Lukas, Barbara Rossi and Tatevik Sekhposyan. “Has the Information Channel of Monetary Policy Disappeared? Revisiting the Empirical Evidence”, *American Economic Journal: Macroeconomics*, forthcoming.

- Stock, J. And M. Watson, Identification and Estimation of Dynamic Causal Effects in Macroeconomics, *Economic Journal*, Vol. 28, Issue 610, May 2018, pp. 917-948.
- Arias, Rubio-Ramírez and Waggoner (2018), Inference Based on SVARs Identified with Sign and Zero Restrictions: Theory and Applications, *Econometrica* 86 (2), March 2018, p. 685-720.
- Montiel-Olea, Stock and Watson (2021), Inference in Structural VARs with External Instruments, *Journal of Econometrics*, Volume 225, Issue 1, November 2021, pp. 74-87
- Uhlig, H., 2005. What are the effects of monetary policy on output? Results from an agnostic identification procedure. *Journal of Monetary Economics*, 52(2), pp. 381-419.

f. Inference for impulse responses

- Kilian, L., 1999. Finite-sample properties of percentile and percentile-t bootstrap confidence intervals for impulse responses. *The Review of Economics and Statistics*, 81(4), pp. 652-60.
- Pesavento, E. and Rossi, B., 2006. Small sample confidence bands for multivariate impulse response functions. *Journal of Applied Econometrics*, 21(8), pp. 1135-55.
- Pesavento, E. and Rossi, R., 2007. Impulse response confidence intervals for persistent data: what have we learned? *Journal of Economic Dynamics and Control*, 31(1), pp. 2398-2412.
- Sims, C. and Zha, T., 1999. Error bands for impulse responses. *Econometrica*, 67(5), pp. 1113- 55.
- Wright, J., 2000. Confidence intervals for univariate impulse responses with a near unit root. *Journal of Business and Economic Statistics*, 18(3), pp. 368-73.
- Inoue, A., B. Rossi and Y. Wang (2022). "Local Projections in Unstable Environments: How Effective is Fiscal Policy?" *CEPR Discussion Paper* No. DP17134.

g. Local Projections

- Jordà, Òscar. 2005. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review*, 95 (1): 161-182.
- Valerie A. Ramey & Sarah Zubairy, 2018. "Government Spending Multipliers in Good Times and in Bad: Evidence from US Historical Data," *Journal of Political Economy*, University of Chicago Press, vol. 126(2), pages 850-901.
- James S. Cloyne & Òscar Jordà & Alan M. Taylor, 2020. "Decomposing the Fiscal Multiplier," NBER Working Papers 26939, National Bureau of Economic Research.
- Montiel Olea, José Luis, and Mikkel Plagborg-Møller. 2021. "Local Projection Inference is Simpler and More Robust Than You Think." *Econometrica* 89 (4): 1789-1823.
- Plagborg-Møller, Mikkel, and Christian K. Wolf. 2021. "Local Projections and VARs Estimate the Same Impulse Responses." *Econometrica* 89 (2): 955-980.

h. Model Evaluation and Forecast Comparison

- Alquist, R., Kilian, L. and Vigfusson, R. Forecasting the price of oil. In G. Elliott and A. Timmermann, eds. 2013. *Handbook of Economic Forecasting, Volume 2*, Part A. Amsterdam: Elsevier-North Holland. Ch. 8.
- Chen, Y., Rogoff, K. and Rossi, B., 2010. Can exchange rates forecast commodity prices? *Quarterly Journal of Economics*, 125(3), 1145-94.
- Edge, R. and Gürkaynak, R., 2010. How useful are estimated DSGE model forecasts for central bankers? *Brookings Papers on Economic Activity*, Fall Issue, pp. 209-59.
- Estrella, A. and Hardouvelis, G., 1991. The term structure as a predictor of real economic activity. *Journal of Finance*, 46(2), pp. 555-76.
- Giacomini R. and Rossi, B., 2006. How stable is the forecasting performance of the yield curve for output growth? *Oxford Bulletin of Economics and Statistics*, 68(s1), pp. 783-95.
- Gürkaynak, R., Kısacıkoğlu, B. and Rossi, B. Do DSGE models forecast more accurately outof-sample than reduced-form models? In: T. Fomby, L. Kilian and A. Murphy, eds. 2013. *Advances in Econometrics, Volume 32: VAR Models in Macroeconomics – New Developments and Applications: Essays in Honor of Christopher A. Sims*. Bingley: Emerald-Insight. Pp. 27-80.
- Romer, C. and Romer, D., 2000. Federal Reserve information and the behavior of interest rates. *American Economic Review*, 90(3), pp. 429-57.
- Rossi, B., 2013. Exchange rate predictability. *Journal of Economic Literature*, 51(4), pp. 1063-1119.
- Rossi, B. and Sekhposyan, T., 2010. Have models' forecasting performance changed over time, and when? *International Journal of Forecasting*, 26(4), pp. 808-35.
- Stock, J. and Watson, M., 1996. Evidence on structural instability in macroeconomic time series relations. *Journal of Business and Economic Statistics*, 14(1), pp. 11-30.
- Rossi, B., 2020. Forecasting in the Presence of Instabilities: How Do We Know Whether Models Predict Well and How to Improve Them, *Journal of Economic Literature*.
- Giacomini, R. and Rossi, B., 2010. Forecast comparisons in unstable environments. *Journal of Applied Econometrics*, 25(4), pp. 595-620.

Tests of Forecast Comparison

- Diebold. F. and Mariano, R., 2002. Comparing predictive accuracy. *Journal of Business and Economic Statistics*, 20(1), pp. 134-44.
- McCracken, M., 2000. Robust out-of-sample inference. *Journal of Econometrics*, 99(2), pp.195-223.
- West, K., 1996. Asymptotic inference about predictive ability. *Econometrica*, 64(5), pp. 1067-84.
- West, K. Forecast evaluation. In: G. Elliott, C. Granger and A. Timmermann, eds. 2006. *Handbook of Economic Forecasting, Volume 1*. Amsterdam: Elsevier-North Holland. Ch. 3.

Special Issues: Nested Models, Null Hypotheses, Instabilities...

- Andrews, D., 1993. Tests for parameter instability and structural change with unknown change point. *Econometrica*, 61(4), pp. 821-56.

- Clark, T. and McCracken, M., 2001. Tests of equal forecast accuracy and encompassing for nested models. *Journal of Econometrics*, 105(1), pp. 85-110.
- Clark, T. and McCracken, M., 2005. The power of tests of predictive ability in the presence of structural breaks. *Journal of Econometrics*, 124(1), pp. 1-31.
- Clark, T. and McCracken, M. Advances in forecast evaluation. In: G. Elliott and A. Timmermann, eds. 2013. *Handbook of Economic Forecasting, Volume 2, Part B*. Amsterdam: Elsevier-North Holland. Ch. 20.
- Clark, T. and McCracken, M., (forthcoming). Nested forecast model comparisons: a new approach to testing equal accuracy. *Journal of Econometrics*.
- Clark, T. and West, K., 2006. Using out-of-sample mean squared prediction errors to test the martingale difference hypothesis. *Journal of Econometrics*, 135(1-2), pp. 155-86.
- Diebold, F. and López, J. Forecast evaluation and combination. In: G.S. Maddala and C.R. Rao, eds. 1996. *Handbook of Statistics, Volume 14: statistical methods in finance*. Amsterdam: Elsevier-North Holland. Ch. 8.
- Giacomini, R. and Rossi, B., 2009. Detecting and predicting forecast breakdowns. *Review of Economic Studies*, 76(2), pp. 669-705.
- Giacomini, R. and Rossi, B., 2010. Forecast comparisons in unstable environments. *Journal of Applied Econometrics*, 25(4), pp. 595-620.
- Giacomini, R. and White, H., 2006. Tests of conditional predictive ability. *Econometrica*, 74(6), pp. 1545-78.
- Inoue, A. and Rossi, B., 2012. Out-of-sample forecast tests robust to the choice of window size. *Journal of Business and Economic Statistics*, 30(3), pp. 432-53.
- Rossi, B. Advances in forecasting under instability. In: G. Elliott and A. Timmermann, eds. 2013. *Handbook of Economic Forecasting, Volume 2, Part B*. Amsterdam: Elsevier-North Holland. Ch. 21.
- Timmermann, A. 2005. Forecast combinations. In: G. Elliott, C.W.J. Granger and A. Timmermann, eds. 2006. *Handbook of Economic Forecasting, Volume 1*. Amsterdam: Elsevier-North Holland. Ch. 4.

Tests of Absolute Forecasting Performance (or Forecast Optimality Tests)

- Mincer, J. and Zarnowitz, V. The evaluation of economic forecasts. In: J. Mincer, ed. 1969. *NBER Book Series Studies in Business Cycles: Economic forecasts and expectations: analysis of forecasting behavior and performance*. New York: National Bureau of Economic Research. Pp. 1-46.
- Rossi, B. and Sekhposyan, T., (2016). Forecast optimality tests in the presence of instabilities with applications to Federal Reserve and survey forecasts. *Journal of Applied Econometrics*.
- West, K. and McCracken, M., 1998. Regression-based tests of predictive ability. *International Economic Review*, 39(4), pp. 817-40.

Predictive Densities

- Amisano, G. and Giacomini, R., 2007. Comparing density forecasts via weighted likelihood ratio tests. *Journal of Business and Economic Statistics*, 25(2), pp. 177-90.
- Clark, T., 2011. Real-time density forecasts from Bayesian vector autoregressions with stochastic volatility. *Journal of Business and Economic Statistics*, 29(3), pp. 327-41.

- Clements, M. and Smith, J., 2000. Evaluating the forecast densities of linear and non-linear models: applications to output growth and unemployment. *Journal of Forecasting*, 19(4), pp. 255-76.
- Corradi, V. and Swanson, N., 2001. Predictive density evaluation. In: G. Elliott, C.W.J. Granger and A. Timmermann, eds. 2006. *Handbook of Economic Forecasting, Volume 1*. Amsterdam:Elsevier-North Holland. Ch. 5.
- Diebold, F., Gunther, T. and Tay, A., 1998. Evaluating density forecasts with applications to financial risk. *International Economic Review*, 39(4), pp. 863-83.
- Diebold, F., Tay, A. and Wallis, K. Evaluating density forecasts: the survey of professional forecasters. In: R. Engle and H. White, eds. 1999. *Cointegration, causality, and forecasting: a festschrift in honour of Clive W.J. Granger*. Oxford: Oxford University Press. Ch. 3.
- Jore, A., Mitchell, J. and Vahey, S., 2010. Combining forecast densities from VARs with uncertain instabilities. *Journal of Applied Econometrics*, 25(4), pp. 621-34.
- Rossi, B. and Sekhposyan, T., 2018. Alternative tests for correct specification of conditional forecast densities, *Journal of Econometrics*.
- Rossi, B. and Sekhposyan, T., 2014. Evaluating predictive densities of US output growth and inflation in a large macroeconomic data set. *International Journal of Forecasting*, 30(3), pp. 662-82.

🔹 Assessment and Grading System

Grading TBA.

There should be various problem sets during the course and short presentations of discussion papers by students.

Please note: I reserve the right to change the information in this syllabus at any time.