Economic Forecasting

Advanced Econometrics Reading Group

PhD in Economics and Statistics – Università degli Studi di Milano Bicocca
PhD in Economics and Finance – Università Cattolica del Sacro Cuore

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Course Description

The availability of accurate forecasts is key for central banks, financial institutions and more generally for all economic agents when their decisions depend on the uncertain future value of one or more variables of interest.

This reading group is intended to be a follow-up to the Time Series module of the Econometrics course taken by students during the first year of the PhD program. The aim is to analyze theoretical and empirical papers in the forecasting literature focusing on macroeconomic and financial applications involving time series as well as panel data.

Prerequisites

Time series econometrics and in particular knowledge of ARDL, ARIMA, GARCH, VAR, Random Walk models and of the concepts of autocorrelation, Granger Causality and robust-covariance estimation. Some knowledge of models for panel data and models for dichotomous dependent variables might also be useful.

Course Objectives

Expose students to the basic issues faced when developing forecasting models in macroeconomics and finance. A tentative list of topics includes:

1. Loss functions
2. Optimal point forecasts
3. Model selection
4. Benchmark models
5. Multiperiod forecasts

6. Forecasting methods
7. Assessing forecasts
8. Desirable properties of forecasts
9. Comparison of forecasts
10. Encompassing
11. Pairwise comparison
12. Comparing many forecasts

Course Structure

After the first two classes – whose aim is to introduce the main issues in forecasting – the reading group will be based on students' presentations of relevant papers selected by the instructor.

Assessment

Each student is expected to give a talk of approximately 25 minutes based on the reading of one of the suggested paper. The talk is followed by a 5 minutes discussion of the paper by another student and 5 minutes of questions from the audience.

The presenter is expected to be able to reply to questions from the discussant, the audience or the instructor.

The evaluation is based on the effectiveness of the presentation, its discussion, as well as to the ability to reply to questions.

Students are expected to attend the entire course. **Active participation is required**.

Required Materials

Introduction to economic forecasting

- Elliott, G. and Timmermann, A. (2008). Economic forecasting. *Journal of Economic Literature*, 46(1):3–56
- Giacomini, R. and Rossi, B. (2013). Forecasting in macroeconomics. In Hashimzade, N. and Thornton, M. A., editors, *Handbook of Research Methods and Applications in Empirical Macroeconomics*, chapter 17, pages 381–408. Edward Elgar Publishing

How to present/write a paper

- Cochrane, J. (2005). Writing tips for Ph.D. students. Available online at: `https://faculty.chicagobooth.edu/john.cochrane/teaching/papers/phd_paper_writing.pdf`
- La Ferrara, E. (2018). How to present your job market paper. Presented at the *2018 European Job Market*, Naples

- Head, K. (2018). Introduction formula. Available online at: `http://blogs.ubc.ca/khead/research/research-advice/formula`
- Storesletten, K. (2018). The ten commandments for how to give a seminar. Presented at the *2018 European Job Market*, Naples

List of papers for presentations

1. Adolfson, M., Lindé, J., and Villani, M. (2007). Forecasting performance of an open economy DSGE model. *Econometric Reviews*, 26(2-4):289–328
2. Aiolfi, M. and Favero, C. (2005). Model uncertainty, thick modelling and the predictability of stock returns. *Journal of Forecasting*, 24(4):233–254
3. Amisano, G. and Giacomini, R. (2007). Comparing density forecasts via weighted likelihood ratio tests. *Journal of Business & Economic Statistics*, 25(2):177–190
4. Andreou, E., Ghysels, E., and Kourtellos, A. (2013). Should macroeconomic forecasters use daily financial data and how? *Journal of Business & Economic Statistics*, 31(2):240–251
5. Baumeister, C., Guérin, P., and Kilian, L. (2015). Do high-frequency financial data help forecast oil prices? the midas touch at work. *International Journal of Forecasting*, 31(2):238–252
6. Baumeister, C., Kilian, L., and Zhou, X. (2018). Are product spreads useful for forecasting oil prices? An empirical evaluation of the Verleger hypothesis. *Macroeconomic Dynamics*, 22(3):562–580
7. Carriero, A., Clark, T., and Marcellino, M. (2015). Bayesian VARs: Specification choices and forecast accuracy. *Journal of Applied Econometrics*, 30(1):46–73
8. Carriero, A. and Giacomini, R. (2011). How useful are no-arbitrage restrictions for forecasting the term structure of interest rates? *Journal of Econometrics*, 164(1):21–34
9. Chen, Y.-C., Rogoff, K. S., and Rossi, B. (2010). Can exchange rates forecast commodity prices? *The Quarterly Journal of Economics*, 125(3):1145–1194
10. Christoffersen, P. F. and Diebold, F. X. (2006). Financial asset returns, direction-of-change forecasting, and volatility dynamics. *Management Science*, 52(8):1273–1287
11. Clark, T. and McCracken, M. (2017). Tests of predictive ability for vector autoregressions used for conditional forecasting. *Journal of Applied Econometrics*, 32(3):533–553
12. Edge, R. M., Gürkaynak, R. S., Reis, R., and Sims, C. A. (2010a). How useful are estimated DSGE model forecasts for central bankers? *Brookings Papers on Economic Activity*, pages 209–259
13. Edge, R. M., Kiley, M. T., and Laforte, J.-P. (2010b). A comparison of forecast performance between Federal Reserve staff forecasts, simple reduced-form models, and a DSGE model. *Journal of Applied Econometrics*, 25(4):720–754
14. Elliott, G. and Timmermann, A. (2008). Economic forecasting. *Journal of Economic Literature*, 46(1):3–56
15. Fouliard, J., Howell, M., and Rey, H. (2019). Answering the Queen: Machine learning and financial crises. `https://www.bis.org/events/conf190628/rey.pdf`

16. Giacomini, R. and Rossi, B. (2013). Forecasting in macroeconomics. In Hashimzade, N. and Thornton, M. A., editors, *Handbook of Research Methods and Applications in Empirical Macroeconomics*, chapter 17, pages 381–408. Edward Elgar Publishing

17. Giacomini, R. and Rossi, B. (2009). Detecting and predicting forecast breakdowns. *The Review of Economic Studies*, 76(2):669–705

18. Giacomini, R. and White, H. (2006). Tests of conditional predictive ability. *Econometrica*, 74(6):1545–1578

19. González-Rivera, G., Lee, T.-H., and Mishra, S. (2004). Forecasting volatility: A reality check based on option pricing, utility function, value-at-risk, and predictive likelihood. *International Journal of Forecasting*, 20(4):629–645

20. Granger, C. W. and Pesaran, M. H. (2000). Economic and statistical measures of forecast accuracy. *Journal of Forecasting*, 19(7):537–560

21. Granger, C. W. J. and Jeon, Y. (2004). Thick modeling. *Economic Modelling*, 21(2):323–343

22. Gu, S., Kelly, B., and Xiu, D. (2018). Empirical asset pricing via machine learning. Working Paper 25398, National Bureau of Economic Research

23. Inoue, A. and Kilian, L. (2008). How useful is bagging in forecasting economic time series? A case study of us consumer price inflation. *Journal of the American Statistical Association*, 103(482):511–522

24. Inoue, A. and Rossi, B. (2008). Monitoring and forecasting currency crises. *Journal of Money, Credit and Banking*, 40(2-3):523–534

25. Kilian, L. and Vigfusson, R. (2013). Do oil prices help forecast U.S. real GDP? The role of nonlinearities and asymmetries. *Journal of Business and Economic Statistics*, 31(1):78–93

26. Liu, L., Moon, H. R., and Schorfheide, F. (2018). Forecasting with dynamic panel data models. Working Paper 25102, National Bureau of Economic Research

27. Liu, L. Y., Patton, A. J., and Sheppard, K. (2015). Does anything beat 5-minute RV? A comparison of realized measures across multiple asset classes. *Journal of Econometrics*, 187(1):293–311

28. Marcellino, M., Stock, J. H., and Watson, M. W. (2006). A comparison of direct and iterated multistep AR methods for forecasting macroeconomic time series. *Journal of Econometrics*, 135(1-2):499–526

29. Patton, A. J. (2011). Volatility forecast comparison using imperfect volatility proxies. *Journal of Econometrics*, 160(1):246–256

30. Pesaran, M. H. and Timmermann, A. (2000). A recursive modelling approach to predicting UK stock returns. *The Economic Journal*, 110(460):159–191

31. Rossi, B. and Sekhposyan, T. (2011). Understanding models' forecasting performance. *Journal of Econometrics*, 164(1):158–172

32. Rossi, B. and Sekhposyan, T. (2010). Have economic models' forecasting performance for US output growth and inflation changed over time, and when? *International Journal of Forecasting*, 26(4):808–835

33. Stock, J. H. and Watson, M. W. (2002). Macroeconomic forecasting using diffusion indexes. *Journal of Business & Economic Statistics*, 20(2):147–162

34. Stock, J. H. and Watson, M. W. (1999). Forecasting inflation. *Journal of Monetary Economics*, 44(2):293–335

35. Timmermann, A. (2008). Elusive return predictability. *International Journal of Forecasting*, 24(1):1–18

36. Welch, I. and Goyal, A. (2007). A comprehensive look at the empirical performance of equity premium prediction. *The Review of Financial Studies*, 21(4):1455–1508

37. White, H. (2000). A reality check for data snooping. *Econometrica*, 68(5):1097–1126

38. Zheng, T., Kelly, B., and Xiu, D. (2019). Predicting returns with text data. Working Paper 26186, National Bureau of Economic Research