

# Syllabus: Time Series Forecasting: with an application to GDP

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Forecasting is a useful device for economic policy making. Numerous institutions like governments, central banks, the European Commission, the OECD, or the IMF regularly provide economic forecasts. This course aims at giving insights into the field of time series forecasting from a practitioner's point of view. The course is additionally going to be augmented with short targeted presentations by the Forecasting team of the Kiel Institute for the World Economy.

## Outline

1. Introduction: Forecasting what and for whom?
2. National accounts
  - a. Short introduction to the system of national accounts
  - b. GDP: Decomposition of the time series
3. Forecasting models
  - a. Time series forecasting: AR, ARMA, ARX, VAR
  - b. Forecasting with ragged edge data
  - c. Out-of-sample forecast experiment
  - d. Judgemental forecasting, conditional forecasting
  - e. Further topics
4. Forecast evaluation
  - a. Loss functions
  - b. Forecast rationality
  - c. Evaluating interval forecasts
5. Forecast comparison and combination
  - a. Diebold-Mariano test
  - b. Test on forecast encompassing
  - c. Forecast combination
6. Forecasting in data rich environments
  - a. Model selection
  - b. Shrinkage
  - c. Bayesian VARs
    - Digression: Bayes statistics
  - d. Factor models
7. Forecasting with ragged edge data and mixed frequencies
  - a. Bridge equations
  - b. Mixed frequency VARs
    - Digression: State space models
  - c. MIDAS

**Readings:**

- F. Lequiller and D. Blades (2006). Understanding national accounts. OECD.
- Economic Outlook of the OECD: <http://www.oecd.org/eco/economicoutlook.htm>
- Economic forecasts of the European Commission: [http://ec.europa.eu/economy\\_finance/eu/forecasts/index\\_en.htm](http://ec.europa.eu/economy_finance/eu/forecasts/index_en.htm)
- Forecasts of the Kiel Institute: [https://www.ifw-kiel.de/think-tank/forecasting-center/konjunkt\\_e/business-cycle-forecast/view?set\\_language=en](https://www.ifw-kiel.de/think-tank/forecasting-center/konjunkt_e/business-cycle-forecast/view?set_language=en)
- Elliott, G., and A. Timmermann (2016). Economic Forecasting. Princeton University Press.
- Hyndman, R.J., and G. Athanasopoulos (2012). Forecasting: Principles and Practice. OTexts. <https://www.otexts.org/fpp/>
- And several papers cited in the lecture slides