

Syllabus: Forecasting in Economics

Daniel Kaufmann

University of Bern

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This course covers various topics on constructing and evaluating economic forecasts and applies the techniques by means of standard time-series models. It covers theory as well as real-world applications in the computer lab. The grade will be based on a take-home assignment in the middle of the semester and a written examination at the end of the semester.

Basic knowledge in statistics and econometrics is a prerequisite and knowledge in univariate time-series analysis is highly recommended. For the applied part, prior knowledge of statistics programs is an advantage, but not a prerequisite. The applications will be presented in the software MATLAB; a brief introduction is given at the beginning of the course.

The final exam is open book and will take place in the computer lab. Some questions have to be answered analytically and some by adapting a MATLAB program. You will use the computers in the lab; no personal electronic devices are allowed. The course material (books, manuals, slides, applications, programs) will be available electronically on the computer and you can bring your own hardcopy.

The main reference for the course is Diebold (2006). The manuscript of this textbook can be downloaded for free from <http://www.ssc.upenn.edu/~fdiebold/Textbooks.html>, *book manuscript* or *book photocopy*.

Office hours after the lecture or by appointment.

20 September

- Principles of forecasting: Diebold (2006) ch. 1 and 3
- Statistics recap: Diebold (2006), ch. 2

27 September

- *Application: An introduction to econometrics in MATLAB*
- Introduction to MATLAB by Kevin Sheppard (https://www.kevinsheppard.com/images/0/06/MATLAB_Introduction_2013.pdf)

4 October

- Building univariate time-series models for forecasting: Diebold (2006), ch. 7, 8, 9
- Exogenous information and scenario analysis: Diebold (2006), ch. 11

11 October

- *Application: Building a forecasting model for UK CPI inflation*
- *Application: Effects of oil price and VAT changes on UK CPI inflation*

18 October (Note that lecture takes place from 2pm-6pm in the PC-Pool)

- Reporting forecasts: Diebold (2006), ch. 9 and Clements (2005), ch. 4
- *Application: Simulate forecast densities by Monte Carlo*
- *Application: A density forecast for Swiss GDP*

Note that lecture on 25 October is cancelled and instead takes place on 18 October!

Take-home assignment The assignment will be distributed by e-mail on 25 October and is due on **Tuesday, 8 November, 8:00 AM**. Hand in a PDF-document with your solution as well as the M-file you used to calculate the results by e-mail. Indicate clearly your name and student number.

1 November

- Evaluating forecasts: Diebold (2006), ch. 12 and Clements (2005), ch. 2, for those more interested in this topic West (2006)

8 November

- Evaluating forecasts: Diebold (2006), ch. 12 and Clements (2005), ch. 2, for those more interested in this topic West (2006)
- Discussion of take-home assignment

15 November

- *Application: Evaluate the Survey of Professional Forecasters*
- *Application: Does the Survey of Professional Forecasters improve simple time-series forecasts?*

22 November

- *Forecasting in practice.* A Senior Economist of the Economic Analysis of the Swiss National Bank will present models used to produce forecasts for various macroeconomic variables and how they integrate other sources of information
- Please make sure to attend this lecture as it will give you a unique glimpse into the practical issues of forecasting in economics

29 November

- Forecast combination: Diebold (2006), ch. 12, and Timmermann (2006) for those more interested in this topic

6 December

- *Application: comparing combination schemes for the Survey of Professional Forecasters*

13 December

- Q&A session. Please send questions until Sunday evening 11 December
- Detecting and dealing with structural breaks (if time permits)

20 December Final exam

References

- CLEMENTS, M. (2005): *Evaluating Econometric Forecasts of Economic and Financial Variables*, Palgrave Macmillan.
- DIEBOLD, F. (2006): *Elements of Forecasting*, Thomson/South-Western, 4 ed.
- TETLOCK, P. E. AND D. GARDNER (2015): *Superforecasting: The Art and Science of Prediction*, Crown.
- TIMMERMANN, A. (2006): *Forecast Combinations*, Elsevier, vol. 1 of *Handbook of Economic Forecasting*, chap. 4, 135–196.
- WEST, K. D. (2006): *Forecast Evaluation*, Elsevier, vol. 1 of *Handbook of Economic Forecasting*, chap. 3, 99–134.