

Syllabus for the Master's (M.Sc.) course "Forecasting methods" (Prognoseverfahren)

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Free University of Berlin Dept. of Economics, Summer 2017
(this first version: March 30th)

Official module label: "Komplexe Methoden der modernen Ökonometrie"

1 Course contents and literature

In this course we will discuss and apply various methods and aspects of forecasting. Obviously the focus will be on the underlying subject matter of economic time series like GDP, industrial production, inflation, interest rates, exchange rates, stock prices and so forth.

Here is a list of keywords and topics that we will cover during the semester (in the first course week participants will be asked for their preferences among the proposed topics):

1. Uni- vs. multivariate forecasting models (including a review of some univariate time series results)
2. Forecast evaluation and tests
3. General (asymmetric) loss functions
4. Volatility forecasts (including a review of relevant univariate volatility models like GARCH)
5. Density forecasts
6. Real-time aspects: data revisions and publication lags
7. Scenario / conditional forecasts
8. Forecast combinations (e.g. model averaging)
9. Discrete variables (time permitting)
10. Granger causality and leading indicators in the frequency domain (time permitting)

We will work quite a bit with the open-source statistics and econometrics program *gretl* (gretl.sf.net) and the following contributed function packages that provide additional functionality and which are available online from within the program: *BreitungCandelonTest.gfn*, *delayspectral.gfn*, *DiebMar.gfn*, *fcModels.gfn*, *FEP.gfn* (Forecast evaluation package), *MGARCH.gfn*.

Some useful background literature will be (preliminary and incomplete):

- Breitung, Jörg / Schreiber, Sven (2016): Assessing Causality and Delay within a Frequency Band, IMK Working Paper Nr. 165. Available online at http://www.boeckler.de/pdf/p_imk_wp_165_2016.pdf
- Fritsche, Ulrich / Tarassow, Artur (2017): Vergleichende Evaluation der Konjunkturprognosen des IMK an der Hans-Böckler-Stiftung für den Zeitraum 2005-2014, IMK Studies Nr. 54. Available online at: http://www.boeckler.de/pdf/p_imk_study_54_2017.pdf
- Lütkepohl, Helmut (2005): *New Introduction to Multiple Time Series Analysis*, Springer.

2 Times and Places (info as of March 30th)

- Lectures: (2SWS) Mondays starting April 24th, HS<basement Garystr. close to cafeteria>, **10-12 (c.t.)**. (Sometimes there won't be a session, see the calendar below.)
- Tutorial sessions (1SWS): Will be held in a block fashion on two or three Fridays or Saturdays, see the calendar below (tba).

3 Contact

- "Office" hours: I work at the Macroeconomic Policy Institute (IMK, www.imk-boeckler.de) and I do not normally have an office at the FU. See me on Mondays after class or by special appointment, possibly at the Berlin office of the Böckler Foundation (Reinhardtstr. 38 in Mitte, next to Karlplatz/Charité).
- Email: sfu@zedat.fu-berlin.de. Please try to contact me in person around class first so I can see whom I'm talking to. But if it cannot wait then don't hesitate to send me your message.
- Online: The standard Blackboard course page, with some additional material added as time goes by. The Blackboard course will (soon) be set to allow self-enrollment.

4 Course requirements and grading (as of March 30th)

- Examination (“Modulprüfung”): This will take the form of a short essay as described in the “Prüfungsordnung” (“Hausarbeit (ca. 12 Seiten)”), written in good English or good German. Essays with too many spelling and similar mistakes will be returned to the students. (Exception: If there is a quasi-consensus among participants that a written exam is preferred we may adopt this alternative examination form. According to the regulations we must make a final decision on this already in the first week.)

The short essay can also take the form of (suitably documented) computer code (e.g. for gretl) that implements some forecasting-related functionality.

Of course students may select this course for a binary pass-or-fail grading (“undifferenzierte Bewertung”) at their own discretion.

- Need to hand in the essay until the end of the semester; the grade of the essay will be the major (and often only) part of your overall grade. Attention: According to the Prüfungsamt there can be no 2nd slots for a “Hausarbeit” (in contrast to what happens with exams / “Klausuren”).
- Follow the course actively by reading the assigned material and contributing to the discussion. If you wish you can hand in an additional mini essay (half the length of the final essay) to obtain some practice and feedback. This voluntary mini essay may increase your final grade a little bit if it is good enough, and would never lower your final grade (bonus grading).
- The course is open for all M.Sc. students who have completed the core Econometric Analysis course. If you have already taken the course on Univariate Time Series Analysis (or even another course on multiple time series) it will be a little easier; but this is not required, as my aim is to make this course self-contained for motivated students. (That’s why we will also include reviews of some univariate time series material.)

5 Calendar (info as of March 30th)

(for time and place of the Monday sessions, see above)

The tutorial sessions will take place on two Fridays or Saturdays in block fashion; details will be determined in the first lecture.¹

- April

– Mon Apr 24th: first lecture session

¹Possible dates do *not* include: rest of April, May 26th/27th (Himmelfahrt weekend), June 2nd/3rd (Pentecost weekend), July 21st/22nd (end of semester).

- May
 - Mon May 1st: no lecture (Labor day holiday)
 - Mon May 8th: yes
 - Mon May 15th: yes
 - Mon May 22nd: yes
 - Mon May 29th: yes

- June
 - Mon June 5th: no lecture (Pentecost holiday)
 - Mon June 12th: yes
 - Mon June 19th: yes
 - Mon June 26th: yes

- July
 - Mon July 3rd: yes
 - Mon July 10th: yes
 - Mon July 17th: yes, final lecture session

6 Other information

- The language of this Master's course is English per default. If it so happens that all participants are sufficiently good speakers of German we may switch to German.