FAU – School of Business, Economics and Society
Chair of Statistics and Econometrics

Seminar: Economic Expectations and Forecasting Methods

Summer term 2022 – Syllabus

Overview: Expectations and forecasts are very important for decision making in economic policy, at firms, and in our private lives. Therefore, it is no surprise that numerous methods have been developed to compute economic forecasts based on different types of data. Especially the availability of big datasets in recent years has led to an adoption of forecasting methods from the machine learning literature in business and economics.

At the same time, researchers, central banks, and other institutions have collected more and more survey data on economic expectations of firms, private households, and professional forecasters that allow analyzing the nature of those expectations and answering questions such as: How large is the observed heterogeneity? Which factors can explain differences in, for instance, inflation or growth forecasts? Do agents with different expectations behave differently?

In this seminar, students will discuss different empirical topics that either deal with specific forecasting methods (ranging from classical time-series models to machine learning approaches) or with a certain feature of observed (survey-based) economic expectations. Students will gain experience in writing academic texts, conducting a literature research and in presenting and discussing empirical economic research. They will be able to explain the basics of advanced forecasting methods, to analyze advantages and disadvantages of forecasting methods, and to interpret survey data about forecasts/expectations.

Main Instructor:
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Office hours: By appointment

Seminar meetings:
- Kick-off meeting at the start of the semester (tba, via Zoom)
- Seminar workshop with student presentations (7.6./8.6., room LG 4.109)

Registration: Please send an e-mail to wiso-oekonometrie@fau.de if you want to register for this seminar. **Deadline for registration is 17 April 2022!**

- Please state clearly i) your name and surname, ii) your student ID, and iii) your first, second, and third choice for a topic that you want to work on in the seminar (see list of topics below).

- **Please register as early as possible – we distribute topics according to a first-come-first-served principle and the number of students is restricted to a maximum of 20. Priority will be given to IES students.**

Grading: Your grade for the module depends on the seminar paper (50 %), the presentation (roughly 30 minutes) of the paper in the seminar (30 %), and your participation in the discussions after the seminar presentations (20 %). We will distribute information about the formal requirements regarding length and layout of the seminar papers during the kick-off meeting.

Deadline for seminar papers: Your seminar paper is due on 10 June 2022 at 12:00h.

List of topics (with "starting literature"):

1. Expectation Formation of Firms and Households

1a. Inflation expectations and supermarket prices
Cavallo, A., G. Cruces, and R. Perez-Truglia (2017). Inflation Expectations, Learning, and Supermarket Prices: Evidence from Survey Experiments, American Economic Journal: Macroeconomics, 9(3), 1-35.

1b. How Do Firms Form Expectations?
Coibion, O., Y. Gorodnichenko, and S. Kumar (2018). How Do Firms Form Their Expectations? New Survey Evidence, American Economic Review, 108(9), 2671-2713.

1c. Socioeconomic Status and Macroeconomic Expectations
Das, S., C. M. Kuhnen, and S. Nagel (2020). Socioeconomic Status and Macroeconomic Expectations, The Review of Financial Studies, 33(1), 395-432.

1d. Personal experience and expectations about aggregate outcomes
Malmendier, U. and S. Nagel (2016). Learning from Inflation Experiences, The Quarterly Journal of Economics, 131, 53-87.

1e. Expectations and business decisions
Coibion, O., Y. Gorodnichenko, and T. Ropele (2020). Inflation expectations and firm decisions: New causal evidence, The Quarterly Journal of Economics, 135(1), 165-219.
Buchheim, L., J. Dovern, C. Krolage, and S. Link (2022). Sentiment and Firm Behavior during the COVID-19 Pandemic, Journal of Economic Behavior & Organization, 195, 186-198.

2. Machine Learning Methods

2a. Random Forrests
Hastie, T., R. Tibsharani, and J. Friedman (2007). The Elements of Statistical Learning, 2nd edition, Springer, Section 15.1 – 15.3 (pp. 587ff).
Mei, J., D. He, R. Harley, T. Habetler, and G. Qu (2014). A random forest method for real-time price forecasting in New York electricity market, in: 2014 IEEE PES General Meeting, Conference & Exposition, pp. 1-5.

2b. Neural Networks
Hastie, T., R. Tibsharani, and J. Friedman (2007). The Elements of Statistical Learning, 2nd edition, Springer, Sections 11.1 – 11.5 (pp. 389ff).
Hajizadeh, E., A. Seifi, M. F. Zarandi, and I. B. Turksen (2012). A hybrid modeling

approach for forecasting the volatility of S&P 500 index return, Expert Systems with Applications, 39(1), 431-436.

2c. LASSO

Hastie, T., R. Tibsharani, and J. Friedman (2007). The Elements of Statistical Learning, 2nd edition, Springer, Section 18.4 (pp. 661ff).

Scherr, S. and J. Zhou (2020). Automatically Identifying Relevant Variables for Linear Regression with the Lasso Method: A Methodological Primer for its Application with R and a Performance Contrast Simulation with Alternative Selection Strategies, Communication Methods and Measures, 14(3), 204-211.

Moriwaki, D. (2019). Nowcasting unemployment rates with smartphone GPS data, in: International Workshop on Multiple-Aspect Analysis of Semantic Trajectories (pp. 21-33). Springer.

3. Text Data in Economic Forecasting

3a. Social Media Data

Schnaubelt, M., T. G. Fischer, and C. Krauss (2020). Separating the signal from the noise–financial machine learning for Twitter, Journal of Economic Dynamics and Control, 114, 103895.

Cui, R., S. Gallino, A. Moreno, and D. J. Zhang (2018). The operational value of social media information, Production and Operations Management, 27(10), 1749-1769.

3b. Media Data

Thorsrud, L. A. (2020). Words are the new numbers: A newsy coincident index of the business cycle, Journal of Business & Economic Statistics, 38(2), 393-409.

3c. Web Search Data

Choi, H. and H. Varian (2012). Predicting the present with Google Trends, Economic Record, 88, 2-9.

Borup, D. and E. C. M. Schütte (2022). In search of a job: Forecasting employment growth using google trends, Journal of Business & Economic Statistics, 40(1), 186-200.

3d. Financial Report Data

Bochkay, K. and C. B. Levine (2019). Using MD&A to improve earnings forecasts, Journal of Accounting, Auditing & Finance, 34(3), 458-482.

4. Time-Varying Parameter Models

4a. Stochastic Volatility Models

Clark, T. E. and F. Ravazzolo (2015). Macroeconomic forecasting performance under alternative specifications of time-varying volatility, Journal of Applied Econometrics, 30(4), 551-575.

4b. TV-VAR Models

D'Agostino, A., L. Gambetti, and D. Giannone (2013). Macroeconomic forecasting and structural change, Journal of Applied Econometrics, 28(1), 82-101.

5. Large-Scale Data Sets

5a. Dynamic Factor Models

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

5b. Large-Scale BVARs

Bańbura, M., D. Giannone, and L. Reichlin (2010). Large Bayesian vector auto regressions, Journal of applied Econometrics, 25(1), 71-92.

6. Hierarchical Forecasting

Athanasopoulos, G., R. A. Ahmed, and R. J. Hyndman (2009). Hierarchical forecasts for Australian domestic tourism, International Journal of Forecasting, 25(1), 146-166.

Hyndman, R. J. and G. Athanasopoulos (2014). Optimally reconciling forecasts in a hierarchy, Foresight: The International Journal of Applied Forecasting, (35), 42-48.

7. Density Forecasting

Kascha, C. and F. Ravazzolo (2010). Combining Inflation Density Forecasts, Journal of Forecasting, 29(1-2), 231-250.

Clements, M. P. (2018). Are macroeconomic density forecasts informative?, International Journal of Forecasting, 34(2), 181-198.

Course requirements: Course participants are required to …

- **Attend.** Students can only pass the course if they attend the seminar workshop because the discussions of the presented papers are an essential part of the seminar.
- **Be interested in empirical research.** The topics deals with empirical analyses of either survey-based expectation data or forecasting methods.
- **Prepare.** All students are required to read at least the abstract and the introduction of the "starting literature" before the seminar workshop.
- **Register on StudOn.** I will make course material available through the course website on StudOn (available from mid-April). I will also make announcements using this platform.