CASE STUDIES
Master Econometrics (ME3)
Master Data Science (MD4)

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Why Case Studies?

In the course **Case Studies** you learn to address statistical problems using raw economic data.

1. Describe the data and use appropriate transformations.
2. Independently choose appropriate statistical methods and adapt them to the problem at hand.
3. Carry out a comprehensive analysis of the data.
4. The results are used to provide an answer to the research question.
5. Both the methodological approach and the results regarding the research question are discussed together with the other participants and presented in a scientific report.
FRED-MD and FRED-QD are large economic databases designed for the empirical analysis of big data.

You can download the data here: https://research.stlouisfed.org/econ/mccracken/fred-databases/

Use version FRED-QD 2021-12.
For each report there are different tasks in which you have to analyze data. For this you are supposed to use R!

Also, you will have to hand in your own code. In certain situations, the code might have to be looked at to confirm your results in the reports!
Overall Task

- Your overall task is to provide one quarter and one year ahead forecasts of GDP growth and inflation (price growth). The two target series have Fred mnemonic: GDPC1 and GDPCTPI.
- Define growth rates as $\log(y_{t+h}) - \log(y_t)$. For $h = 1$ you obtain one quarter growth and for $h = 4$ you obtain one year growth.
- Consider the mean squared forecasting error (MSFE) as performance measure.
- Use an autoregressive model of order one as a benchmark model.
- Think about possible explanations/interpretation why some methods work better than others.
Three Reports

Overall there will be two short and one long report:

- Short report about basic time series modeling (no more than 15 pages)

- Short report about a comparison of different statistical learning methods (no more than 15 pages)

- Longer report about an exhaustive analysis with comparisons of different methods (no more than 30 pages)
Requirements

M.Sc. study program Econometrics:

► All requirements obtained in case of conditional admission (any of modules ME Req1 to ME Req7).
► All conditions must be fulfilled before the beginning of the course ‘Case Studies’.
► **Highly recommended:** Successful pass of module ME1 (Statistical Theory)

M.Sc. study program Data Science:

► All requirements obtained in case of conditional admission (any of modules MD Req1 to MD Req7).
► All conditions must be fulfilled before the beginning of the course ‘Case Studies’.
► **Highly recommended:** Successful pass of module MD2 (Statistical Theory)
Dates

- Thursdays 12:45 to 15:45
- CDI 121
- First Meeting: April 07, 2022