MADS - "Statec Workshop" (Vasja S., 21/11/2024)

Homework III - VAR model

In this homework, you will forecast the time series that you selected in HW I using a multivariate model. The folder 'Ex_UNIMULTI_TS.zip' contains the relevant code and commands to perform this task. You can use alternative packages, commands, or software. Please return the homework in a markdown, Word, or PDF file. Also, attach the script and data used to perform the analysis (Python, R, or Matlab).

The provisional deadline for homework III is the 1st of December.

Name the submitted files as follows:

HWIII_analysis_[yourLastName].ipnyb/rmd/doc/pdf - In this file you describe the analysis

HWIII_data_[yourLastName].*   - this file should contain the data

HWIII_script_[yourLastName].*   - this file should contain the code which produces results

If you are using markdown, then HWII_script_[yourLastName].* is not needed.

While writing the analysis file, please follow the heading tags used below.

Please perform the following steps:

1. [New Series] Find an additional series that could improve the forecasting of the series you chose in HWI. For example, if you initially selected rGDP, consider including the industrial production index in your model. If you were working with temperature data, think about adding temperature data from a nearby city or country. If you are having trouble finding a relevant series, please send me an email.

2. [VAR estimation] Take the two stationary series (from step 1), reserve the first 80% of the sample for estimation, and choose a suitable VAR model. Provide justification for your selection.

3. [VAR forecasts] Utilize the model from step 2 to conduct one-step-ahead forecasts for your series over the remaining 20% of the sample. You can find detailed instructions in HWI, and you can also refer to the code in ' Ex_multi_TS_real_data.Rmd/Ex_multi_TS_real_data.ipynb' for assistance.

BONUS: Plot impulse response of variable that you selected in HW1 to a shock in the variable that you selected in this homework. Describe and interpret the impulse response.