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GS|EFM
GRADUATE SCHOOL OF ECONOMICS, FINANCE, AND MANAGEMENT

Solution, Identification and Estimation of DSGE Models
Project Presentations

Schedule of Presentations (Wednesday, February 14, HoF, Room Toronto):

14:00 – 15:10 (60 Minutes Presentation, 10 Minutes Discussion)
Luca Pennacchio, Julian Stein and Maximilian Vilt
Chen et al. (2012): The Macroeconomic Effects of Large-Scale Asset Purchase Programmes, *The Economic Journal*, https://www.jstor.org/stable/23324225

15:15 – 16:05 (40 Minutes Presentation, 10 Minutes Discussion)
Andrei Radionov and Sodik Umurzakov
Carlstrom et al. (2014): Estimating Contract Indexation in a Financial Accelerator Model, *Journal of Economic Dynamics and Control*, https://www.sciencedirect.com/science/article/pii/S016518891400147X

16:10 – 17:00 (40 Minutes Presentation, 10 Minutes Discussion)
Daewoong Kwon and Amir Foroozande
Justiniano et al. (2011): Investment Shocks and the Relative Price of Investment, *Review of Economic Dynamics*, https://www.sciencedirect.com/science/article/pii/S1094202510000396

Data Set

The zip file Raw_and_Transformed_Data_Project.zip (see the OLAT course website) contains data for the in-sample period from 1986:Q1 to 2019:Q4. The data are available in "raw" and "transformed" format, with the transformations intended to extract the business-cycle frequencies for log-linear model analysis (see the two MATLAB m-files carrying out the transformations for further details). The time series are for the following variables:

- federal funds rate (FFR)
- fixed private investment (FPI)
- GDP deflator-based inflation (GDPDEF)
- real wages (WAGE)
- real consumption (CONS).

Expected Content of Presentations:

- (Critical) Explanation of the model motivation and model specification.

- Replace the model's monetary policy rule with the following common (log-linear) monetary policy rule (where r_t denotes the nominal interest rate, π_t the rate of inflation, and y_t output):

$$r_t = \phi_r \cdot r_{t-1} + (1-\phi_r) \cdot \left[\phi_\pi \cdot \pi_t + \phi_y \cdot \left(y_t - y_{t-1} \right) \right] + \varepsilon_t^r \ , \quad \varepsilon_t^r \overset{iid}{\sim} \left(0, \sigma_r^2 \right).$$

- Analysis of the model's identification properties using the approach of Qu and Tkachenko (2017). You are free to choose (i) a suitable neighborhood that is excluded from the identification analysis as well as (ii) economically sensible lower and upper bounds for the model parameters.

- Estimation of the model on the basis of the linearized model equations, using Maximum Likelihood: In particular, re-write the model in state-space form and write a MATLAB file that computes the model's likelihood function in prediction error format using the Kalman filter. Use the data set posted on the course website to compute Maximum Likelihood estimates, and compare (a sub-set of) the estimated parameters for the in-sample period from 1986:Q1 to 2019:Q4 − including the parameters in the common monetary policy rule − to the original ones from the paper analyzed.

- Compute and analyze the model's impulse response functions (with confidence bands) for (the economically most interesting sub-set of) the model's endogenous variables, depicting a one percent increase in the monetary policy rate, as well as (in similar format) for other shocks analyzed in the paper (to the extent that that there is sufficient time).

- Calculate forecasts for the out-of-sample period from 2020:Q1 to 2021:Q1 for (the economically most interesting sub-set of) the model's endogenous variables, and compare these to ARIMA(p,d,q) model forecasts (estimating a separate ARIMA(p,d,q) model for the in-sample period for each variable in (the economically most interesting sub-) set of the model's endogenous variables).