Econometrics III (module 5, 2023–2024)

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Assignment 6

Problem 1 "NKPC", 20 points

The New Keynesian Phillips Curve (NKPC) is a model of inflation, according to which the short run inflation dynamics are driven by the expected discounted stream of real marginal costs. Researchers often use a specification that includes both forward-looking and backward-looking dynamics:

$$\pi_t = \lambda x_t + \gamma_f E_t \pi_{t+1} + \gamma_b \pi_{t-1} + u_t,$$

where π_t denotes inflation, x_t is the labor share (which is a proxy for real marginal costs), E_t denotes the expectation conditional on information up to time t, and u_t is an unobserved cost shock assumed to have the property $E_{t-1}(u_t) = 0$. We are given the data sample $\{x_t, \pi_t\}_{t=1}^{T}$, which is assumed to be a segment of realizations of stationary and ergodic series.

Describe *in detail* how to obtain estimates of the model parameters, to construct their standard errors, and to test the validity of the model – all this *in a closed form*.

Hint: it may be useful to represent the future inflation as $\pi_{t+1} = E_t \pi_{t+1} + v_{t+1}$ where v_{t+1} is inflation shock with the property $E_t(v_{t+1}) = 0$.

Problem 2 "Exchange rates again", 20 points

Recall the problem "Testing for forecast unbiasedness" from Assignment 3. For both types of forwards, test the conditional unbiasedness hypothesis by using the overlapping block bootstrap with the block length equal 15. With 3-month forwards, use the Newey–West HAC long run variance estimator. Compare the critical values you obtained using the asymptotic and bootstrap approaches. In case of large discrepancies, speculate on their possible sources.

Problem 3 "Recall and bootstrap", 10 points

Recall the problem "Publish or perish" from Assignment 4. Describe *in detail* how to test the hypothesis from Part 2 using the best available bootstrap.