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Problem Set 11

Advanced Macroeconomics

Winter 2025/26

Cost-Push Shock in a New Keynesian Model

Smets and Wouters, 2007 estimate a New Keynesian model with multiple shocks for the US economy. The Macroeconomic Model Data Base provides a replication code for this paper. Download the replication package and use the code in the folder US_SW07.

1. The New-Keynesian Phillips curve in the paper is given as (p. 590):

$$\pi_t = \pi_1 \pi_{t-1} + \pi_2 E_t \pi_{t+1} - \pi_3 \mu_t^p + \epsilon_t^p$$

   with inflation π_{t+s} in period $t+s$, coefficients π_i, $i = 1, 2, 3$, price mark-up μ_t^p, and a shock variable ϵ_t^p. Explain the role of the variables and coefficients in this equation.

2. What would you expect in case of a cost-push shock?

3. Open the replication code. Search for the price setting curve. How is the cost-push shock implemented?

4. Simulate the model with cost-push shock and explain the effects on the variables.

5. Vary the monetary policy reaction parameters and explain the changes in the standard deviations of output and inflation gap you observe.

References

Smets, Frank and Rafael Wouters (2007). "Shocks and frictions in US business cycles: A Bayesian DSGE approach". In: *American economic review* 97.3, pp. 586–606.