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Frank Smets and Rafael Wouters
"Monetary Policy in an Estimated SDGE Model of the Euro Area"
Discussion by Lars E.O. Svensson

- Fine paper
- Eurosystem's 1st pillar
- Indexation and the natural-rate hypothesis
- Reaction function and microfoundations
- Optimizing welfare vs. simple loss function
- Exploiting the powerful linear-quadratic framework
- Find optimal/simple targeting rule

- The Eurosystem's 1st pillar (page 6)

  Additively separable utility

$$U_t^\tau = u(C_t^\tau - H_t) - v(l_t^\tau) + h(\frac{Q_t^\tau}{P_t}) \qquad (2)$$

  Demand for real balances

$$\frac{h'(\frac{Q_t^\tau}{P_t})}{u'(C_t^\tau - H_t)} = \frac{i_t}{1+i_t} \qquad (8)$$

  No role for money in the transmission mechanism of monetary policy/predicting inflation (Q reused for real value of capital)

  Even without additive separability, insignificant effect (McCallum, Nelson, Woodford,...)

- Indexation and the natural-rate hypothesis

  Non-adjusted wages: Partial indexation to lagged inflation, γ^w

$$\hat{W}_t^\tau - \hat{W}_{t-1}^\tau = \gamma^w \hat{\pi}_{t-1} \qquad (9)$$

  Better: Partial indexation relative to deviation of lagged inflation from average inflation

$$\hat{W}_t^\tau - \hat{W}_{t-1}^\tau = \gamma^w (\hat{\pi}_{t-1} - \mathrm{E}[\hat{\pi}_t])$$

  Real-wage equation

$$\begin{aligned}\hat{w}_t = {} & \frac{\beta}{1+\beta}\hat{w}_{t+1|t} + \frac{1}{1+\beta}\hat{w}_{t-1} + \frac{\beta}{1+\beta}(\hat{\pi}_{t+1|t} - \mathrm{E}[\pi_t]) \\ & - \frac{1+\beta\gamma_w}{1+\beta}(\hat{\pi}_t - \mathrm{E}[\pi_t]) + \frac{\gamma^w}{1+\beta}(\hat{\pi}_{t-1} - \mathrm{E}[\pi_t]) \\ & - \ldots \end{aligned} \qquad (36)$$

  $\mathrm{E}[\hat{w}_t]$ independent of $\mathrm{E}[\pi_t]$

Non-adjusted prices: Partial indexation to lagged inflation, γ^p
Better: Partial indexation to deviation of lagged inflation from average inflation

$$\hat{\pi}_t - \mathrm{E}[\pi_t] = \frac{\beta}{1+\beta\gamma^p}(\hat{\pi}_{t+1|t} - \mathrm{E}[\pi_t]) + \frac{\gamma^p}{1+\beta\gamma^p}(\hat{\pi}_{t-1} - \mathrm{E}[\pi_t]) + ... \quad (35)$$

Fulfill natural-rate hypothesis: $\mathrm{E}[\hat{Y}_t]$ independent of $\mathrm{E}[\pi_t]$
Important for welfare

- Reaction function and microfoundations ($\hat{R}_t = \ln(1+i_t) \approx i_t$)

$$\hat{R}_t = \rho \hat{R}_{t-1} + (1-\rho)\left[\bar{\pi}_t + r_\pi(\hat{\pi}_{t-1} - \bar{\pi}_t) + r_{\pi e}(\hat{\pi}_{t+1|t} - \hat{\pi}_t) + r_y(\hat{Y}_t - \hat{Y}_{t-1})\right] + \varepsilon_t^R \quad (39)$$

  - Mechanical, arbitrary, depend on other variables?
  - Simultaneity, $\hat{\pi}_t$, $\hat{\pi}_{t+1|t}$, $\hat{Y}_t$ jump variables, not operational
  - Instrument depend on predetermined variables
  - More realistic: $\hat{\pi}_t$, $\hat{Y}_t$ predetermined
  - Microfoundations!

- Optimizing welfare not operational
  - Simple loss function: For example, flexible inflation targeting

$$\mathrm{E}_t \sum_{s=t}^{\infty} \delta^{s-t} L_s$$

$$L_s = \frac{1}{2}[(\hat{\pi}_t - \bar{\pi}_t)^2 + \lambda x_t^2]$$

  $x_t \equiv \hat{Y}_t - \hat{Y}_t^n$ output gap
  - Compare with welfare
  - Find optimal λ and definition of potential output, $\hat{Y}_t^n$
- Exploit linear-quadratic setup
  - Equilibrium under discretion, commitment,
  - Compare commitment, /discretion, welfare/simple loss function, welfare loss
  - Optimal simple loss function under discretion and commitment (λ, $\hat{Y}_t^n$)

- Derive optimal/simple Euler condition/FOC (MRS = MRT)
  - Optimal/simple targeting rules
  - Commitment to optimal/simple targeting rule rather than instrument rule
  - Get close to optimal policy under commitment