Discussion of:

Real Keynesian Models and Sticky Prices

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The Real Keynesian Model

- $$\textbf{(D)EE} \quad : \quad \hat{y}_t = \underset{\substack{\uparrow \\ \text{EE discount}}}{\alpha_l} \mathbb{E}_t\left(\hat{y}_{t+1}\right) - \alpha_r\left(\hat{\imath}_t - \mathbb{E}_t\left[\pi_{t+1}\right]\right) + d_t$$

  $$\textbf{RKPC} \quad : \quad \pi_t = \beta \mathbb{E}_t\left[\pi_{t+1}\right] + \kappa\{\gamma_l \hat{y}_t + \underset{\substack{\uparrow \\ \text{cost channel}}}{\gamma_r}(\hat{\imath}_t - \mathbb{E}_t\left[\pi_{t+1}\right])\} + \mu_t$$

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- **intuition**: change in input use by bottom production layer
- now use this to eliminate $i_t - \mathbb{E}_t\left[\pi_{t+1}\right]$ from **(D)EE** and get:

  $$y_t = \underbrace{\left(\frac{\alpha_l}{1 - \alpha_r \gamma_l / \gamma_r}\right)}_{A \in (0,1) \text{ under RK cond.}} \mathbb{E}_t\left(y_{t+1}\right) + \left(\frac{1}{1 - \alpha_r \gamma_l / \gamma_r}\right) d_t$$

The Real Keynesian Model

- **intuition** for the expansionary effect of a d-shock in flex-price limit ?
- start with model **without** cost channel ($\gamma_r = 0$)
- at given nominal interest rate, prices and wages, firms serve demand; their "notional" labor demand rises, and so does the nominal wage
- firms pass this cost through to prices until the mark-up (i.e., the inverse of RMC) is back to its optimal value
- the central bank adjusts $\hat{\imath}_t$ upwards
- ultimately, $\{\hat{\imath}_t, \pi_t\}$ adjust so that $\hat{\imath}_t - \mathbb{E}_t [\pi_{t+1}] = \alpha_r^{-1} d_t \ \forall t$
- **how does the cost channel break this feature?**

The Real Keynesian Model

- direct impact on notional labor demand and upward pressure on nominal wage are identical as before
- firms pass this through to prices until RMC is back to optimal **but this no longer requires the same real wage as before**
- w_t can rise provided that $\hat{\imath}_t - \mathbb{E}_t\left[\pi_{t+1}\right]$ falls
- **demand side**: households consume more in the present (direct effect of d_t-shock + indirect effect from $\hat{\imath}_t - E_t\left[\pi_{t+1}\right]$)
- **supply side**: households work more in the present
- carries over to sticky prices, except that both w_t and $\hat{\imath}_t - \mathbb{E}_t\left[\pi_{t+1}\right]$ can rise since RMC is countercyclical
- breakdown of divine coincidence and potential policy tradeoff from demand shocks (see Ravenna & Walsh JME 2006)

Comment #1: Specification of the cost channel

- standard specification (e.g., CEE 2005; Ravenna-Walsh 2006) has **nominal** interest rate in firms' real marginal cost because wage bill must be paid in advance of production. **Does this matter?**

- with wage bill paid in advance the nominal cost of an hour of work is $W_t (1 + i_t)$ and the RMC (wo. capital) becomes:

$$\varphi_t = \frac{W_t}{P_t} (1 + i_t)$$

- NKPC becomes:

$$\pi_t = \beta \mathbb{E}_t [\pi_{t+1}] + \kappa \underbrace{(\gamma \hat{y}_t + \hat{\imath}_t)}_{\hat{\varphi}_t} + \mu_t$$

- flex-price limit now has:

$$\hat{y}_t = -\frac{1}{\gamma} \hat{\imath}_t$$

- **intuition**: lower $\hat{\imath}_t$ reduces cost of financing the wage bill and hence boosts labor demand, employment and output

Comment #1: Specification of the cost channel

- no longer possible to eliminate $\hat{\imath}_t - \mathbb{E}_t\left[\pi_{t+1}\right]$ from **(D)EE**:

$$y_t \quad = \quad \alpha_l \mathbb{E}_t\left(y_{t+1}\right) - \alpha_r\big(\underset{\substack{\uparrow \\ -\gamma y_t}}{\hat{\imath}_t} - \mathbb{E}_t\left[\pi_{t+1}\right]\big) + d_t$$

- even flex-price limit needs another equation

- assume following **interest-rate rule**:

$$\hat{\imath}_t \quad = \quad \phi_l \hat{y}_t + \phi_\pi \mathbb{E}_t\left[\pi_{t+1}\right]$$

- (D)EE + interest-rate rule + constant RMC gives flex-price solution

Comment #1: Specification of the cost channel

- you get:

$$\hat{y}_t = \underbrace{\left\{ \frac{\alpha_l \phi_\pi}{\phi_\pi (1 - \alpha_r \gamma) + \alpha_r (\gamma + \phi_l)} \right\}}_{\in(0,1)?} \mathbb{E}_t (\hat{y}_{t+1})$$

$$+ \underbrace{\left\{ \frac{\phi_\pi}{\phi_\pi (1 - \alpha_r \gamma) + \alpha_r (\gamma + \phi_l)} \right\}}_{>0?} d_t$$

- different "RK condition":

$$\phi_\pi (1 - \alpha_r \gamma - \alpha_l) + \alpha_r (\gamma + \phi_l) \quad > \quad 0$$

- Taylor rule coefficients (and, probably, shape) play a key role

- EE discount ($\alpha_l < 1$) no longer necessary (can even have $\alpha_l > 1$)

Comment #1: Specification of the cost channel

- now look at responses to iid d-shocks and **away** from sticky prices
- in this case **both** models give (with $\phi_\pi = 1$ in Beaudry-Portier):

$$
\begin{aligned}
y_t &= \left(\frac{1}{1+\alpha_r \phi_l}\right) d_t \\
\hat{\imath}_t &= \left(\frac{\phi_l}{1+\alpha_r \phi_l}\right) d_t \\
\pi_t &= \left(\frac{\kappa\gamma + \phi_l}{1+\alpha_r \phi_l}\right) d_t
\end{aligned}
$$

- dynamics is robust in that specific case at least

Comment #1: Specification of the cost channel

Bottom line

- RK condition sensitive to model details
- model workings at/away from flex-price limit may/may not be
- how sensitive are empirical results to (implicit) parameter restriction?

Comment #2: RK model with sticky prices (Section 2)

- recall **(D)EE**:

$$\hat{y}_t = \alpha_l \mathbb{E}_t(\hat{y}_{t+1}) - \alpha_r(i_t - \mathbb{E}_t[\pi_{t+1}]) + d_t$$

- posit interest rate rule:

$$\hat{\imath}_t = \mathbb{E}_t[\pi_{t+1}] + \phi_l \hat{y}_t$$

- then

$$\hat{y}_t = \left(\frac{\alpha_l}{1+\alpha_r\phi}\right)\mathbb{E}_t(\hat{y}_{t+1}) + \left(\frac{1}{1+\alpha_r\phi}\right)d_t$$

- Prop. 3 and 4 follow (impact of d_t-shocks on output and inflation)
- **what does it have to do with NK versus RK?**
- isn't it just about (bad) monetary policy?
- knife-edge Taylor rule that disconnects **(D)EE** from rest of model

Comment #3: Structural estimation

- **baseline**: ML-estimation of purely forward-looking model
- reduced form representation has no endogenous persistence
- then extended to backward looking **(D)EE**
- what about inflation persistence? interest rate smoothing?
- risk of mis-specification

Summary

- not **one** great paper but **two**!
- rejuvination of cost channel and implications
- a number of intriguing results (some less)
- issue of robustness w.r.t. specification
- not-so-innocuous restrictions in structural estimation