Discussion of Svensson's

What Rule for the Federal Reserve? Forecast Targeting

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What Svensson's Paper Is About

- Hates Taylor rule
  - Not optimal, too rigid, too mechanical
- Apparently wants to implement optimal policy derived from model
- Likes current regime because it seems to be moving in the right direction

- Consider many policy paths
- For each path, compute equilibrium in model, assuming commitment

Svensson's Proposal

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Svensson's Proposal

- Consider many policy paths
- For each path, compute equilibrium in model, assuming commitment
  - Hidden question: How to select equilibrium if model has multiplicity?
- Setting aside hidden question, pick "best" policy path

What Is Missing in Proposal

- What will policymaker do if outcome = forecasts?
  - Presumably implement announced policy
- What will policy maker do if outcomes $\neq$ forecasts?
- What will policy maker do if circumstances change, shocks affect economy?

What Is Needed to Complete Proposal

- Implement announced path if outcomes $=$ forecasts
- Commit to what policy will do if no shocks and outcomes $\neq$ forecasts
  - Needed to solve indeterminacy problem
- Commit to what policy will do if shocks affect economy

What Will We End Up with?

- Let policy be r_t
- Let history of outcomes be

$$h_t^0 = (Y_0, Y_1, \ldots, Y_{t-1};\ \pi_0, \ldots, \pi_{t-1};\ \textit{other endogenous variables})$$

Y_t: output in t

π_t: inflation in t

- Let history of shocks be s^t
- History of policymakers $h_t = (h_t^0, s^t)$
- Let $r_t = r_t(h_t)$
- But this is exactly what *all* economic theory says you should do!
    - Policymaker should go away until there is a compelling reason to change model

My Discussion

- Lay out optimal policy in New-Keynesian model
- Show how optimal policy looks like forecast targeting
- Discuss how to solve indeterminacy problem
- Suggest practical ways of attaining commitment

Optimal Policy in a New-Keynesian Model

Ingredients of New-Keynesian Model

- Monopolistic competition as in Dixit-Stiglitz-Spence-Ethier
- Calvo price setting
- Shocks to technology: implicit in efficient output y_t^*
- Shocks to intertemporal Euler equation: ε_t
- Shocks to markups: u_t

Equilibrium Conditions

- Log-linearize around zero inflation, efficient steady state

$$
\begin{aligned}
\tilde{y}_t &= \mathbb{E}_t\left(\tilde{y}_{t+1}\right) - \frac{1}{\sigma}\left[\tilde{r}_t - \mathbb{E}_t\left(\pi_{t+1}\right)\right] + \varepsilon_t \\
\tilde{\pi}_t &= \beta \mathbb{E}_t\left(\tilde{\pi}_{t+1}\right) + \kappa \tilde{y}_t + u_t \\
\tilde{y}_t &= y_t - y_t^* \\
\tilde{\pi}_t &= \pi_t - 0 \\
\tilde{r}_t &= r_t - r_t^*
\end{aligned}
$$

y_t^*: efficient output level

r_t^*: real interest rate in efficient allocation (nominal rate since $\pi_t^* = 0$)

Optimal Policy

- Solves

$$\min \sum_{t=0}^{\infty} \beta^t \left[(\tilde{y}_t)^2 + \lambda (\tilde{\pi}_t)^2 \right]$$

subject to equilibrium conditions

- Optimal policy tries to keep $\tilde{y}_t$ and $\tilde{\pi}_t$ close to zero

- Suppose y_t^* iid
- Can keep $\pi_t = 0$, $\tilde{y}_t = 0 = y_t - y_t^*$ by lowering r_t

Optimal Policy and Technology Shocks

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\end{aligned}
$$

Optimal Policy and Technology Shocks

- Suppose y_t^* iid
- Can keep $\pi_t = 0$, $\tilde{y}_t = 0 = y_t - y_t^*$ by lowering r_t
- Suppose y_t^* random walk $\Rightarrow r_t^*$ constant
- Can keep $\pi_t = 0$, $\tilde{y}_t = 0 = y_t - y_t^*$ by leaving r_t unaffected

Optimal Policy and Markup Shocks

- Say markup shock positive
- Cannot keep $\pi_t = 0$ and $y_0 = y_0^*$
- Compromise is to let π_0 go up, y_0 fall
- Compromise also by letting $\pi_{t+1} \neq 0$ and $\tilde{y}_{t+1} \neq 0$ for $t \geq 0$

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Optimal Policy and Markup Shocks

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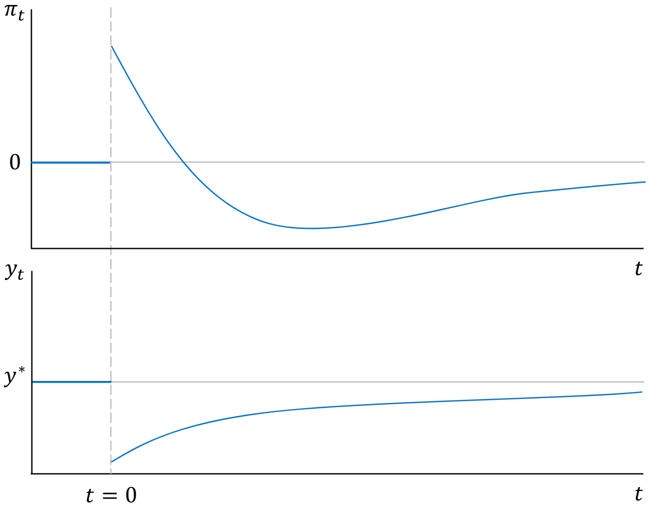
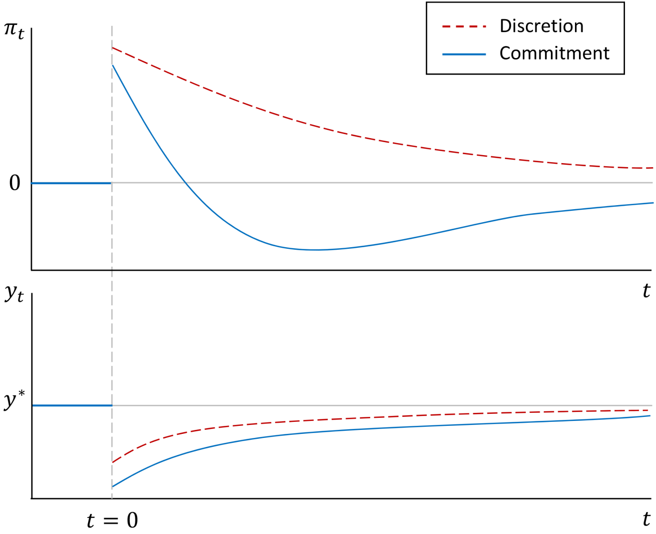
- Compromise also by letting $\pi_{t+1} \neq 0$ and $\tilde{y}_{t+1} \neq 0$ for $t \geq 0$
- Such a policy is optimal *even if* markup shocks are iid
- Next, impulse-response of optimal policy if u_t persistent

Optimal Response to Markup Shocks



- Substantial history dependence
- Very different from outcomes without commitment
  - Without commitment, do not need to react to *history* of markup shocks

Optimal Discretionary Response to Markup Shocks



- Central banker can show pictures like previous ones
- Argue commitment outcomes are best
- Can also try to explain how markup shocks affect economy
- In this sense, forecast targeting conveys information about underlying shocks

Risks of Forecast Targeting

Risks of Incompletely Spelled out Svensson's Proposal

- Suppose market believes policy path will be rigidly followed
- Even if outcomes $\neq$ forecasts
- Economy has continuum of equilibria (indeterminacy)
- Point of Taylor principle was to avoid indeterminacy
- Not addressing this point makes paper seem irrelevant

Idea behind Indeterminacy

- Start at some equilibrium
- Now suppose each price setter expects other price setters to set a higher price
- If monetary policy is sufficiently accommodative, wages and price setter's costs will rise
- Optimal for price setter to go along and set a higher price

Cure for Indeterminacy

- Atkeson-Chari-Kehoe (ACK)
- Taylor principle makes r_t very responsive to π_t
- ACK show Taylor principle neither necessary nor sufficient to cure indeterminacy
- ACK show that a hybrid rule can implement equilibrium uniquely
- Hybrid rule uses Taylor principle supplemented with a switch to money regime if inflation sufficiently high

Optimal Policy with Markup Shocks along Equilibrium Path

- Timing: markup shocks, prices set, interest rates set, output realized

- Along equilibrium path

$$r_t = r_t\left(u^t\right)$$

  u^t: history of markup shocks

- Along equilibrium path r_t may respond less than inflation

- Along equilibrium path, Taylor principle violated

Optimal Policy with Markup Shocks Off Equilibrium Path

- On and off equilibrium path

$$r_t = r_t\left(u^t\right) + \phi\left[\pi_t - \pi_t\left(u^t\right)\right], \qquad \phi > 1$$

$\pi_t\left(u^t\right)$: equilibrium inflation under optimal policy
$\pi_t - \pi_t\left(u^t\right)$: deviation from desired equilibrium

- Avoids indeterminacy when coupled with hybrid rule

Svensson's Proposal Modified

- Describe policy paths for several scenarios
- Each scenario represents some sequence of changes in circumstances and shocks
- Explain and justify deviations from announced path in term of what new shocks have affected economy
- Lay out policy if shocks small but outcomes very different from forecasts

- Monetary policy is a signal extraction problem
- What shocks have occurred?
- Are they persistent or transitory?
- New-Keynesian model useful in solving signal extraction problem

$$\tilde{y}_t = \mathbb{E}_t\left(\tilde{y}_{t+1}\right) - \frac{1}{\sigma}\left[\tilde{r}_t - \mathbb{E}_t\left(\pi_{t+1}\right)\right] + \varepsilon_t$$
$$\tilde{\pi}_t = \beta\mathbb{E}_t\left(\tilde{\pi}_{t+1}\right) + \kappa\tilde{y}_t + u_t$$
$$\tilde{y}_t = y_t - y_t^*$$

- Technology shocks rise output and leave inflation roughly unaffected
- Markup shocks drive output and inflation in opposite directions
- Can exploit differential responses to estimate shocks