On the Optimal Choice of Monetary Policy Instruments

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This paper does 2 things:

- Argues CB should follow passive i-rate rules
  - Endogenous tightness: pick equilibrium with best outcome
  - Eliminate indeterminacy by using *sophisticated* policies
- Formalize advantage of transparent instruments
  - Easier to implement trigger strategy equilibria w/o commitment
    - Easier to detect deviations
  - Less developed economies use exchange rates

Passive i-rate rules are desirable

- Policy objective $\min_{i_t} -\frac{1}{2} E_\eta \left[(x_t - \pi_t)^2 + (y_t - \bar{y})^2 + \pi_t^2 \right]$
- Euler equation: $y_t = E_t[y_{t+1}] - \sigma(i_t - E_t[\pi_{t+1}]) + \eta_t$
- Taylor rule: $i_t = \bar{i} + aE_{t-1}\pi_t + bE_{t-1}y_t$
- Equilibria w/ commitment:

$$x_{t+1} = ax_t + c\eta_t,\ \pi_t = x_t + (1 + \sigma c)\eta_t,\ \text{and } y_t = (1 + \sigma c)\eta_t$$

- Unique equilibrium if $a > 1$: $c = 0$
- But: $c^* = -2\sigma/(1 + 2\sigma^2)$ better than $c = 0$
- Implement by announcing switch to money growth rule if $c \neq c^*$

Passive i-rate rules are desirable

- This is a bold policy prescription

- Consensus:

  - good monetary policy should be aggressive
    - increase i more than 1-for-1 with inflation

  - passive monetary policy explains inflation pre-1979

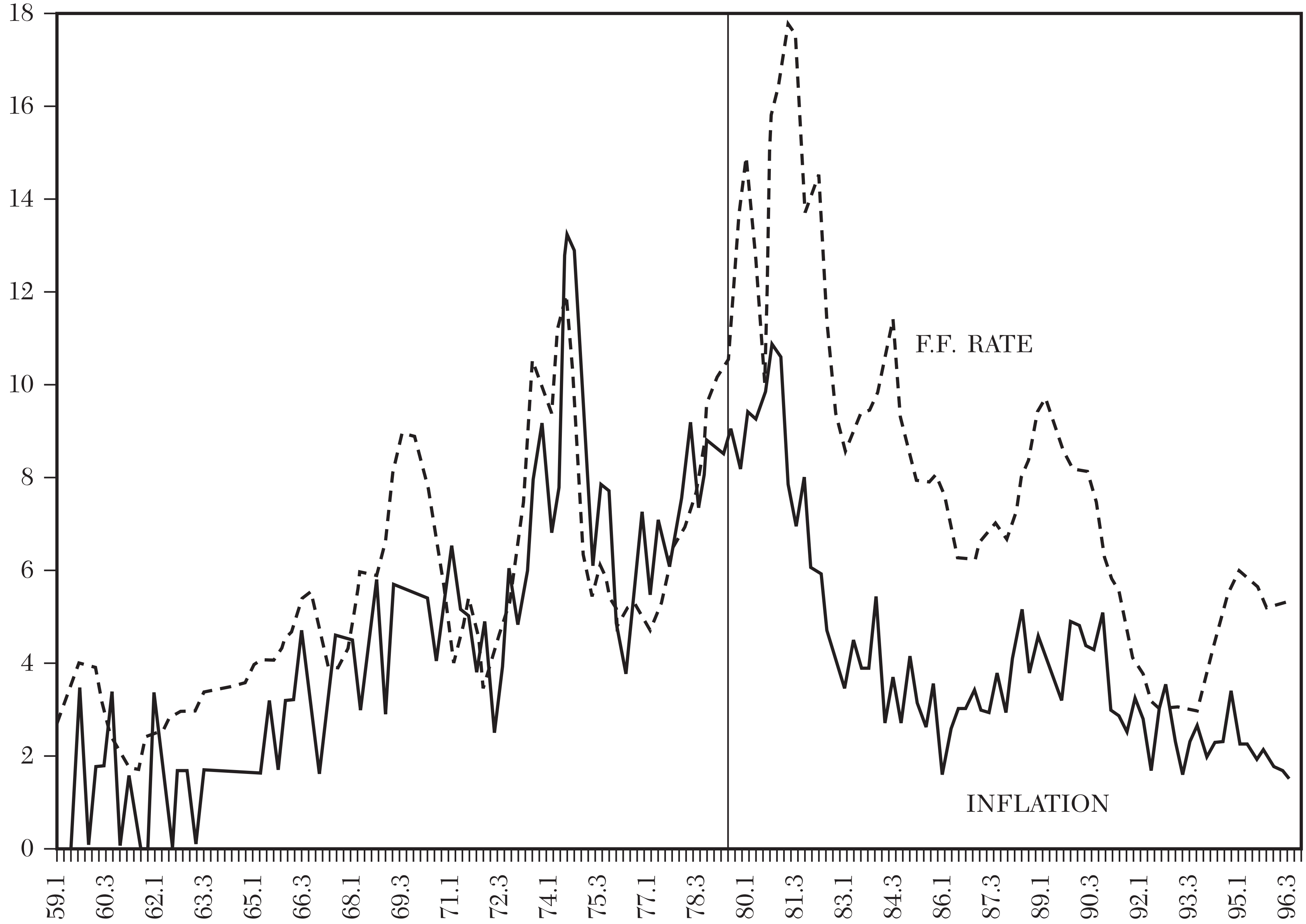

Figure 4. The Federal Funds Rate and the Inflation Rate

TABLE 1
ESTIMATES OF POLICY REACTION FUNCTION

	γ_π	γ_x
Pre-Volcker	0.83	0.27
	(0.07)	(0.08)
Volcker–Greenspan	2.15	0.93
	(0.40)	(0.42)

Is desirability of passive rules a robust result?

- Phillips curve: $y_t = \pi_t - E_{t-1}\pi_t$
- Timing assumptions: i set prior to realization of η
- Forward-looking Taylor rules
- Use alternative, New Keynesian, framework
  - Clarida, Gali, Gertler (1999)

Alternative framework: Calvo price-setting frictions

- Policy objective $\max_{\pi_t, y_t} -\frac{1}{2} E \sum_{t=0}^{\infty} \beta^t \left(\alpha y_t^2 + \pi_t^2 \right)$
- Phillips curve $\pi_t = \lambda y_t + \beta E_t \pi_{t+1} + \epsilon_t, \;\; \epsilon_t = \rho \epsilon_{t-1} + u_t$
- Euler equation $y_t = E_t y_{t+1} - \sigma (i_t - E_t \pi_{t+1})$
- Pretend CB can choose π and *y* directly
- Then back out i-rate rule from Euler equation

Optimal allocation under commitment

$$\max_{\pi_t, y_t} -\frac{1}{2} E \sum_{t=0}^{\infty} \beta^t \left(\alpha y_t^2 + \pi_t^2\right)$$

subject to $\quad \pi_t = \lambda y_t + \beta E_t \pi_{t+1} + \epsilon_t$

- FOC under commitment: $\quad \pi_t = -\frac{\alpha}{\lambda} \Delta y_t$
- Plug into $\quad y_t = E_t y_{t+1} - \sigma(i_t - E_t \pi_{t+1})$
- Interest-rate rule: $\quad i_t = \left(1 - \frac{\lambda}{\alpha} \frac{1}{\sigma}\right) E_t \pi_{t+1}$
- Optimal rule is passive

Optimal allocation under discretion

$$\max_{\pi_t, y_t} -\frac{1}{2} E \sum_{t=0}^{\infty} \beta^t \left(\alpha y_t^2 + \pi_t^2 \right)$$

subject to $\pi_t = \lambda y_t + \beta E_t \pi_{t+1} + \epsilon_t$

- FOC under discretion: $\pi_t = -\frac{\alpha}{\lambda} y_t$

- Interest-rate rule: $i_t = \left(1 + \frac{(1-\rho)\lambda}{\rho\sigma\alpha} \right) E_t \pi_{t+1}$

- Optimal rule is active

Comments/Questions

- Credibility even more important with *sophisticated policies*
  - Equilibrium pinned down only if government credibly commits to money growth/active rules off the equilibrium path

- How large are gains from passive interest rules?
  - Do they outweigh gains from a robust active rule?

Related work: liquidity traps

- Benhabib, Shmitt-Grohe, Uribe (2001):
  - Active i-rate rules can generate global indeterminacy
    - Zero-bound on nominal i-rates
- Illustrate with flexible price model:
  - Euler equation $i_t = E_t \pi_{t+1}$
  - i-rate rule: $i_t = \bar{i} + \gamma_\pi E_t \pi_{t+1},\ i_t \geq 0$
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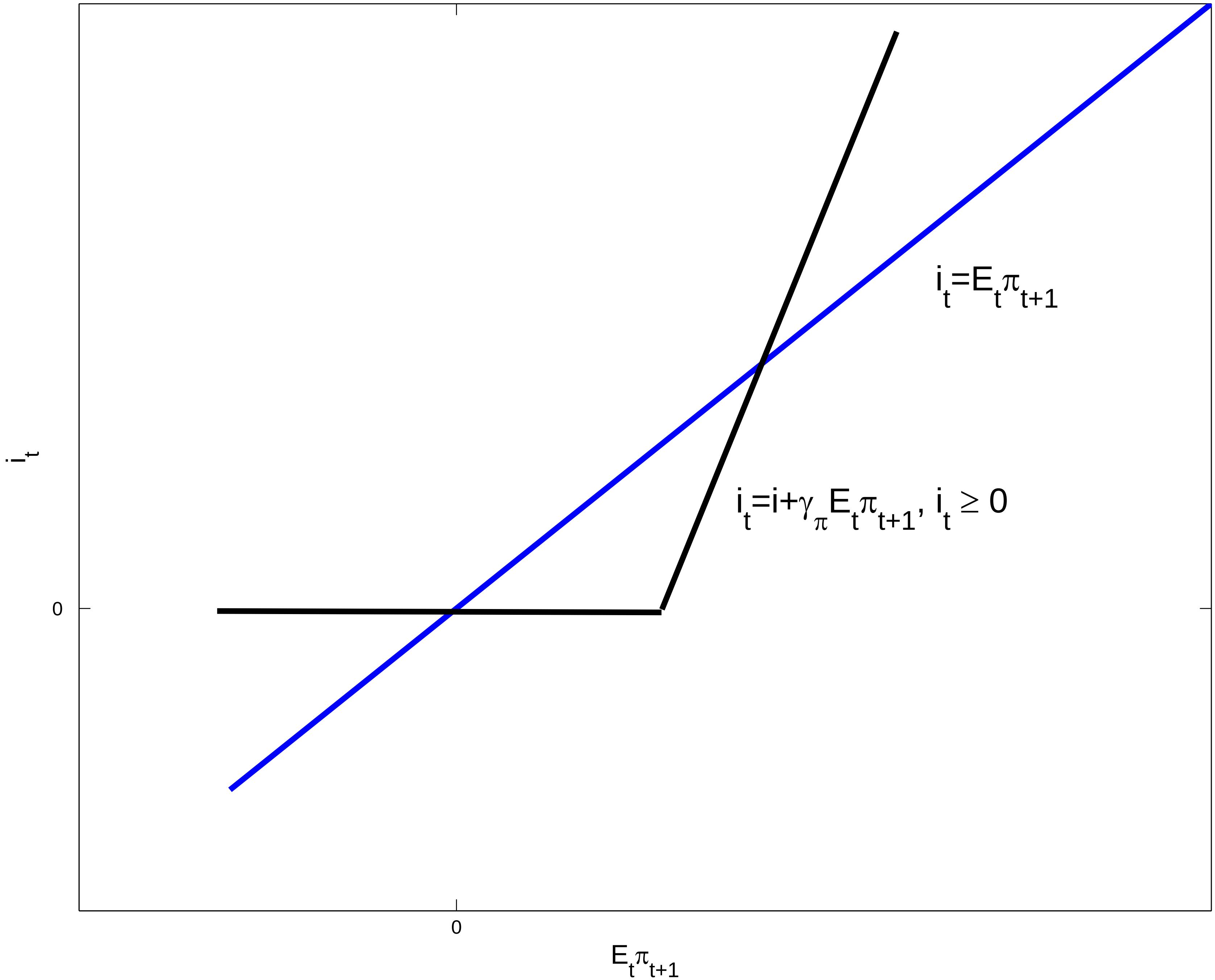
Global indeterminacy with zero-bound on i-rates



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- Krugman (1998), Benhabib et. al (2001):
  - print money to avoid liquidity trap

Advantage of transparent instruments

- Transparency (observability) matters if no commitment
  - More difficult for public to detect deviations if instrument observed imperfectly:
  - Exchange-rate instrument $\pi_t = e_t + \pi_t^*$
  - Money growth instrument $\pi_t = \mu_t + \varepsilon_t$
  - If instrument unobserved (money growth), can only condition continuation values on π: tighter ICC constraint

Alternative explanations for use of XR instrument

- More rigid instrument: commitment device
  - E.g. dollarization, currency unions

- Exchange rates in objective function in SOE

$$\max -\frac{1}{2} E \sum_{t=0}^{\infty} \beta^t \left(\alpha y_t^2 + \pi_t^2 + \gamma e_t^2 \right)$$

Conclusions

- Excellent paper !
- Makes 2 important points:
  - Commitment to a particular inflation objective improves welfare
    - No need to be constrained by active i-rate rules
  - Transparent instruments help overcome time-inconsistency problem