The fiscal theory of the price level and monetary policy: An agenda

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Outline:

- FTPL theoretical controversies settled.
- Now: How to apply it – data, history and policy?
- Founding equation:

\[
\frac{B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \beta^j \frac{\Lambda_{t+j}}{\Lambda_t} s_{t+j}
\]

- Theme: We’ve spent too much time on \( \{E_t s_{t+j}\} \). \( \frac{\Lambda_{t+j}}{\Lambda_t} \) and \( B_{t-1} \)!
- Discount rate variation matters a lot.
- Monetary policy matters a lot, can fix standard model problems.
- Paper plugs:
  2. “Monetary Policy with Interest on Reserves”
  3. “Do Higher Interest Rates Raise or Lower Inflation?”
  4. Next papers too!
Understanding Cyclical Inflation (R)

\[
\frac{B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \beta^j \frac{\Lambda_{t+j}}{\Lambda_t} s_{t+j} = E_t \sum_{j=0}^{\infty} \beta^j \frac{1}{\prod_{k=1}^{j} R_{t+k}} s_{t+j}
\]

- \(s_t, E_t s_{t+j}, B\), all point to inflation.
- \(R\) decline; \(P/D = 1/(r - g)\) equivalent is large.
- Asset pricing: Variation in \(P/X\) is all from \(\Lambda, R\), not \(s\).
- \(R\) version is an identity. No test. Why \(R\)? “Flight to quality.” Fed?
Fiscal theory and monetary policy (B)

- Start very simple – constant $R$, no monetary or pricing frictions. →

$$\frac{B_{t-1}}{P_t} = E_t \sum_{j=0}^{\infty} \beta^j s_{t+j}$$

$$\frac{B_{t-1}}{P_{t-1}} (E_t - E_{t-1}) \left( \frac{P_{t-1}}{P_t} \right) = (E_t - E_{t-1}) \sum_{j=0}^{\infty} \beta^j s_{t+j}. \quad (1)$$

$$\frac{B_{t-1}}{P_{t-1}} E_{t-1} \left( \frac{P_{t-1}}{P_t} \right) = E_{t-1} \sum_{j=0}^{\infty} \beta^j s_{t+j}. \quad (2)$$

- *Unexpected inflation $\pi$ is determined entirely by expectations of future surpluses.* → Solves determinacy issues.

- *The government can entirely determine expected inflation by “monetary policy” – nominal bond sales $B_{t-1}$, with no change in surpluses.* (Currency reform/Share split)
Interest rate targets

▶ "Monetary policy" (B, no s) can set a nominal interest rate target. Interest rate targets completely control expected inflation.

\[ Q_{t-1} = \frac{1}{1 + i_{t-1}} = \beta E_{t-1} \left( \frac{P_{t-1}}{P_t} \right). \]  

\[ \frac{B_{t-1}}{P_{t-1}} \frac{1}{1 + i_{t-1}} = E_{t-1} \sum_{j=0}^{\infty} \beta^{j+1} s_{t+j}. \] (4)

▶ Story 1 (simple): Fix \( i_t \), not \( B_t \) in bond auction.
▶ Story 2 (realistic): Fed raises \( i_t \), ior. Treasury sees \( i_t \), (4) says how much \( B_t \) to sell. (More \( i \), more \( B \) to raise same \( s \)).

Bottom line:
▶ FTPL rehabilitates even fixed nominal interest rate targets! No indeterminacy (Sargent-Wallace, Woodford) or instability (Friedman 1968, old-Keynesian policy establishment)

\[ i_t = \text{set by Fed} \approx r + E_t \pi_{t+1} \]

\[ \pi_{t+1} - E_t \pi_{t+1} = (E_{t+1} - E_t) \sum_{j=0}^{\infty} \beta^j s_{t+j} \]

▶ Compelling story for recent experience: \( i = 0, \pi \) declines as \( r \) rises.
Interest rate targets – impulse-response

\[ i_t = r + E_t \pi_{t+1} ; \pi_{t+1} - E_t \pi_{t+1} = (E_t - E_{t-1}) \sum \beta^j s_{t+j} \]

Agenda: Pricing frictions? Monetary frictions? Standard prediction of (temporarily) lower \( \pi \)?

Agenda: You can import the whole NK/DSGE model except "active" off-equilibrium interest rate rules, and thus different jumps after shocks (indexed by \( \Delta E_{t+1}(s_{t+j}) \)). This makes a big difference!
Model

\[ c_t = E_t c_{t+1} - \sigma (i_t - E_t \pi_{t+1}) \]

\[ \pi_t = \kappa c_t \]

To solve,

\[ \pi_t = E_t \pi_{t+1} - \sigma \kappa (i_t - E_t \pi_{t+1}) \]

So solution:

\[ E_t \pi_{t+1} = \frac{1}{1 + \sigma \kappa} \pi_t + \frac{\sigma \kappa}{1 + \sigma \kappa} i_t \]

\[ \pi_{t+1} - E_t \pi_{t+1} = (E_{t+1} - E_t) \sum_{j=0}^{\infty} \beta^j s_{t+j} \]

- IR \{E_t \pi_{t+j}\} does not depend on expected vs. unexpected \( i \)
- \( \pi \) response is stable, hence follows \( i \).
Impulse-response, simple price stickiness model

\[ c_t = E_t c_{t+1} - (i_t - E_t \pi_{t+1}) \]
\[ \pi_t = c_t \]
\[ \pi_{t+1} - E_t \pi_{t+1} = (E_{t+1} - E_t) \sum \beta_j s_{t+j} \]

▶ Expected vs. unexpected the same. “Neo-Fisherian.”
Impulse-response, simple price stickiness model

\[ c_t = E_t c_{t+1} - \left(i_t - E_t \pi_{t+1}\right) \]

\[ \pi_t = c_t \]

\[ \pi_{t+1} - E_t \pi_{t+1} = (E_{t+1} - E_t) \sum \beta_j s_{t+j} \]

▸ Mix \( i \) rise with fiscal shock. (Conventional NK. Data?)
Impulse-response, simple price stickiness model

\[ c_t = E_t c_{t+1} - (i_t - E_t \pi_{t+1}) \]

\[ \pi_t = c_t \]

\[ \pi_{t+1} - E_t \pi_{t+1} = (E_{t+1} - E_t) \sum \beta_j s_{t+j} \]

- Pre-announced interest rate rise.
A Real New-Keynesian + FTPL model

\[ x_t = E_t x_{t+1} - \sigma (i_t - E_t \pi_{t+1}) \]

\[ \pi_t = \beta E_t \pi_{t+1} + \kappa x_t \]
Agenda

▶ To impulse-response, effects of monetary policy
  1. FTPL + pricing frictions + monetary frictions (money in U) + maturity structure + real rates alter PV(s):
  2. Interest rate rise (without fiscal shock) robustly raises inflation.
  3. Standard NK adds a negative fiscal shock to reduce inflation
  4. Key ingredient: Forward-looking “IS” curve. (Robust to money, Phillips)

\[ c_t = E_t c_{t+1} - \sigma (i_t - E_t \pi_{t+1}) \]

▶ Impulse response future
  1. Lots and lots of frictions (liquidity constraints, irrational expectations abandon IS?)
  2. Or, maybe evidence for negative sign has combined money and fiscal shocks. Interest alone does raise inflation?

▶ Next steps:
  1. Optimal monetary policy?
  2. Better monetary/fiscal arrangements? (Communicate and commit)
  3. Example: Target real/nominal spread to target \( E_t \pi_{t+1} \). “Fiscal Taylor Rule” that \( s \) will defend \( P \) just enough.

\[ b_{t-1} = \sum \beta^i (s_0 + s_1 P_{t+j}) \]