

Discussion of "Optimal Fiscal and Monetary Policy when Money is Essential," by Aruoba and Chugh.

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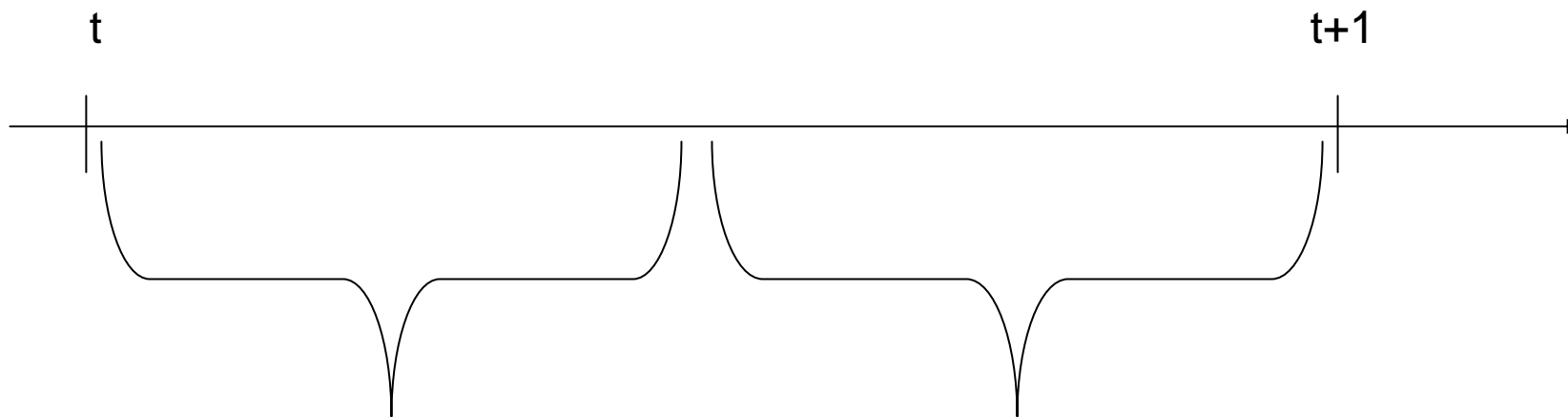
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Three Main Results on Ramsey policies in "applied" monetary economies:

- I. The Friedman rule (FR) is optimal in a large class of economies.
- II. Realized inflation should be used to absorb shocks to government spending or productivity when state contingent government bonds are not available *absent relative price distortions*.
- III. The optimal tax on capital is zero in the steady state.

AC's findings for a "basic" monetary economy overturn each of these results.

The Economy in Brief



CM

States: $M_{t-1}, B_{t-1}, G_t, Z_t$

Prices: P_t, R_t

Taxes: τ_t^h

Controls: X_t, H_t, B_t, M_t

DM

States: m_t, Z_t

Prices: d_t

Controls: q_t

I. Optimality of the Friedman Rule

Logic in applied economies: Friedman vs Phelps debate

Friedman: $R > 1$ leads to distortions as agents economize on holdings of cash

Phelps: $R > 1$ taxes cash holdings and may be optimal if only distortionary taxes are available as an alternative

Chari, Christiano and Kehoe (1996):

- Adopt Phelps' public finance approach e.g. only *distortionary* taxes are available
- Find FR is optimal when consumption elasticity of real balances is ≥ 1

Rationale:

- CIA economies: Uniform commodity taxation (Atkinson and Stiglitz, 1972)
- MIU and ST economies: Taxation of Intermediate Goods (Diamond and Mirrlees, 1971)

I. Optimality of the Friedman Rule

Previous results in basic economies:

- FR optimal with bargaining and price taking

LW: Seller's bargaining power implies buyers hold too little money → Optimal to subsidize money holdings → Equilibrium restriction implies $R = 1$

Lagos and Rocheteau (2005): LW with endogenous search intensity

- FR not optimal under price posting (Head and Kumar, 2005) → Buyers look for more prices and sellers' bargaining power is eroded if $R > 1$

Lessons:

- Large welfare costs associated with $R > 1$
- Price setting mechanism potentially key

Limitations:

- No coexistence of money and bonds
- Absence of other distortionary taxes

→ Friedman vs Phelps debate not addressed

I. Optimality of the Friedman Rule

AC: { Result 1: FR not optimal under price taking
Result 2: FR not optimal for buyer's bargaining power high enough

Surprising results, given LW

Rationale: Phelps logic

I. Optimality of the Friedman Rule

Intuition under price taking ($\theta = 1$):

- $R = 1$ implies $u'(q) = c_q(q, Z) \rightarrow$ No DM distortions

\implies FR would be optimal with lump sum taxes

but

- distortion in CM market

$$\frac{A}{U'(X_t)} = (1 - \tau_t^h) Z_t$$

implies

- optimal to distort margin between CM and DM consumption

$$U'(X_t) \frac{M_t}{P_t} = c(q_t, Z_t) R_t$$

\implies *Distortions optimally spread out across CM and DM.*

I. Optimality of the Friedman Rule

Intuition under bargaining ($\theta < 1$):

1. Hold up problem in DM $\rightarrow q_t$ too low

2. Labor tax distortion in CM $\rightarrow X_t$ too low

\implies 1. *dominates for low bargaining power of the buyer (θ)*

\implies FR optimal

Additional fiscal instruments and the FR

Price taking: Sales tax in DM does not remove $R > 1$ result

Logic:

Sales tax in DM does not affect DM-CM margin

⇒ Generates an additional unnecessary distortion in DM

⇒ Optimal sales tax is zero (or as low as possible).

Conjecture:

- With $\theta < 1$, sales subsidies in DM may be optimal
- $R > 1$ to reduce CM distortion.

II. Realized inflation volatility

AC:

- *Quasi-linearity of preferences in CM*

⇒ Optimal to fully absorb shocks to G_t and productivity with fluctuations in hours on the CM market

⇒ No need to use realized inflation to make real bond returns state contingent

- *Productivity same in DM and CM*

⇒ Margin between CM and DM constant

Low inflation volatility and constant labor tax results hinge crucially on quasi-linearity assumption

⇒ Forces that shape stochastic properties of inflation in applied economies absent from this model

III. Optimal Capital Tax

$$U'(X_t) = \beta E_t \left\{ U'(X_{t+1}) \left[1 + (1 - \tau_{t+1}^k) (r_{t+1} - \delta) \right] \right\} + \sigma \gamma (q_t, K_{t+1}, Z_t)$$

Hold-up problem in DM \rightarrow Seller does not appropriate full returns to capital

\implies Capital too low \implies Capital subsidy is optimal

Price taking exacerbates capital hold-up problem \rightarrow Larger capital subsidy

Surprising result: Quantitatively large values of the capital subsidy.

Final Remarks

- Dichotomy of DM and CM in basic model does not imply DM/CM margin is undistorted
 - Interesting to explore additional fiscal instruments that affect this margin
- Still no coexistence between money and bonds
- Analytical tractability, e.g. quasi-linearity in preferences, prevents analysis of stochastic properties in comparison with applied economies
- Time inconsistency in model without capital?