

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

Stefania Albanesi, Columbia University and NBER

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## Common Wisdom on Optimal Ramsey Policies:

- I. The Friedman rule (FR) is optimal in a large class of economies.
- II. Realized inflation should be used to absorb shocks when state contingent government bonds are not available *absent relative price distortions*.

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

## 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  $\geq 1$

*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

*Existing results in basic economies:*

- LW: Seller's bargaining power implies buyers hold too little money
  - ⇒ Optimal to subsidize money holdings
  - ⇒ Lower bound constraint implies  $R = 1$
- Lagos and Rocheteau (2005): Endogenous search intensity
  - ⇒ Buyers look for more prices and sellers' bargaining power is eroded if  $R > 1$
  - ⇒ FR not optimal under price posting

*Lessons:*

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

*Limitations:*

- No bonds and no distortionary taxes
- ⇒ Friedman vs Phelps debate not addressed

## I. Optimality of the Friedman Rule

AC:  $\left\{ \begin{array}{l} \text{Result 1: FR not optimal under price taking} \\ \text{Result 2: FR not optimal for buyer's bargaining power high enough} \end{array} \right.$

Surprising results, given LW

*Rationale:* Phelps logic

## I. Optimality of the Friedman Rule

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

- Buyer appropriates all the surplus and seller is not compensated for cost of production in DM  $\rightarrow q_t$  too high
  - $\implies$  Wedge between marginal value and marginal cost of  $q_t$
- $R > 1$  corrects this wedge:
  - Forces buyer to internalize cost of production in DM
  - Redistributes surplus to seller
  - $\implies$  Departure from the FR corrects an inefficiency in DM

## **Additional fiscal instruments and the FR**

- Sales tax in DM: Indeterminacy between sales tax on DM and  $R > 1$
- Tax on buyer's surplus  $\implies$  FR optimal

*Logic:*

- Need an instrument to correct the wedge between marginal value and marginal cost in DM
- Presence of this wedge stems from division of surplus
- $R > 1$  natural instrument

## I. Optimality of the Friedman Rule

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

- Seller's bargaining power generates hold up problem in DM  $\rightarrow q_t$  too low
- Hold up problem partially offsets marginal value wedge
- Hold up problem inversely related to  $\theta \implies$ 
  - $R$  positively related to  $\theta$
  - Binding lower bound constraint on  $R \implies$  FR optimal for  $\theta$  low enough

*Question:*

- Optimality of FR linked to Hosios condition on DM?

## Connection with results in applied economies

- Uniform commodity taxation logic:
    - Optimal to tax cash goods when consumption elasticity of real balances is  $\leq 1 \implies$  FR not optimal
    - Optimal to subsidize cash goods when consumption elasticity of real balances is  $\geq 1 \implies$  FR is optimal due to binding lower bound constraint on  $R$
- $\implies$  With non-homothetic preferences  $R > 1$  is "non generic" but same allocation can be achieved by other instruments

## II. Realized inflation volatility

- *Productivity same in DM and CM*

⇒ Margin between CM and DM should be constant

⇒ Fluctuations in realized inflation disrupt CM-DM wedge

- *Quasi-linearity of preferences in CM*

⇒ Can costlessly absorb shocks with fluctuations in hours on the CM market

⇒ Smaller need to resort to realized inflation as a shock absorber

★ This is not the whole story!

*Result:*

- Close to random walk behavior for optimal inflation

## Comparison with applied economies

- State contingency in realized bond returns:

$$R_{t-1}b_{t-1}/\pi_t$$

- CCK → generated by fluctuations in  $\pi_t$
- AC → generated by fluctuations in  $b_{t-1}$

*Conjecture:*

- Timing must matter!

*Observations:*

- Variations in debt issuance provide state contingency in realized bond returns  $\implies$  Departure from Barro (1979) logic
- Dynamics of inflation driven by relative price distortion  $\implies$  Independent from need to respond to shocks

## Open Questions

- What is an empirically relevant value of  $\theta$ ?
- Time inconsistency?