Discussion of
Implicit Fiscal Guarantee for Monetary Stability
by G. Gaballo and Mengus

Guido Ascari *University of Oxford and Pavia*

Money in the Digital Age
Bank of Finland & CEPR Conference
12-13 June 2018

Summary

- Very nice paper on a very fundamental questions
  - when money has value?
  - hyperinflations?
  - monetary and fiscal policy interactions
- At the core of macro/ monetary economics
- Virtue: simplicity
- Still preliminary, high potential

Summary

- Simple OLG model with money (Samuelson, 1956; Gale 1973)

1. No policy
2. Optimal policy with state-contingent taxes
3. Optimal policy without state-contingent taxes

- Results
  - 1: three different equilibria: pure monetary equilibrium, asymptotic autarky equilibrium, pure autarky equilibrium
  - 2: rules out hyperinflations and autarky: only equilibrium = the efficient monetary one
  - 3: which equilibrium depends on the degree of benevolence and the ratio taxes/endowment

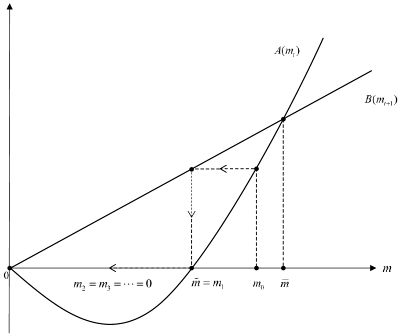
Outline

- Brock (1974, 1975), Wallace (1981) and Obstfeld and Rogoff (1983,2017): fiscal backing and hyperinflation equilibria
  - hyperinflations can always arise in pure fiat money models
  - ...but they are spectacularly fragile => easy to rule out: the government credibly guarantees an extremely small trade-in value for currency

- Sargent and Wallace (1981) unpleasant monetarist arithmetic

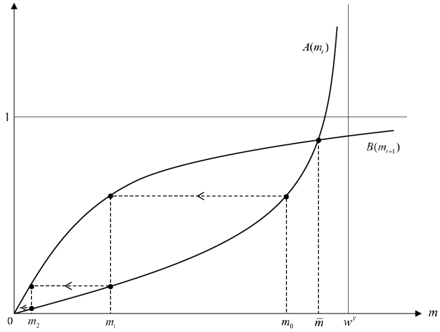
Brock (1974, 1975)

$$\underbrace{m_t\left[u'(y)-v'(m_t)\right]}_{A(m)}=\underbrace{\beta u'(y)m_{t+1}}_{B(m)}$$



Obstfled and Rogoff (2017), based on Wallace (1981)

$$\underbrace{m_t u'(w^y - m_t)}_{A(m)} = \underbrace{u'(w^o + m_{t+1})m_{t+1}}_{B(m)}$$



Intuition

- Monetary and Fiscal authority budget constraint: $M_t =$ liabilities of public sector

$$\frac{M_t}{P_t} = \frac{M_{t-1}}{P_t} + T_{t,o} + G_t - T_{t,y}$$

$$m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB_t$$

Intuition

- Monetary and Fiscal authority budget constraint: $M_t =$ liabilities of public sector

$$\frac{M_t}{P_t} = \frac{M_{t-1}}{P_t} + T_{t,o} + G_t - T_{t,y}$$

$$m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB_t$$

- Assume $PB_t = 0 =>$ no taxes/spending: $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1}$.

Intuition

- Monetary and Fiscal authority budget constraint: $M_t =$ liabilities of public sector

$$\frac{M_t}{P_t} = \frac{M_{t-1}}{P_t} + T_{t,o} + G_t - T_{t,y}$$

$$m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB_t$$

- Assume $PB_t = 0 => $ no taxes/spending: $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1}$.
- Existence of a non-monetary equilibrium requires that the return from money is the same as the one of storage: $\theta < 1$

$$\frac{1}{\Pi} = \theta => \Pi = \theta^{-1} > 1 => \text{ INFLATION}$$

Intuition

- Monetary and Fiscal authority budget constraint: M_t = liabilities of public sector

$$\frac{M_t}{P_t} = \frac{M_{t-1}}{P_t} + T_{t,o} + G_t - T_{t,y}$$

$$m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB_t$$

- Assume $PB_t = 0 => $ no taxes/spending: $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1}$.
- Existence of a non-monetary equilibrium requires that the return from money is the same as the one of storage: $\theta < 1$

$$\frac{1}{\Pi} = \theta => \Pi = \theta^{-1} > 1 => \text{ INFLATION}$$

- The real value of money, m, shrinks over time, *every* initial price level corresponds to a perfect-foresight equilibrium: indeterminate initial price level.

Intuition: a positive PB destroys non-monetary equilibria

- Assume $PB_t = PB > 0, \forall t$ and non-monetary equilibrium so that $\left(\frac{1}{\Pi_{t-1}}\right) = \theta < 1$

Intuition: a positive PB destroys non-monetary equilibria

- Assume $PB_t = PB > 0, \forall t$ and non-monetary equilibrium so that $\left(\frac{1}{\Pi_{t-1}}\right) = \theta < 1$
- Then $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB$ is a stable difference equation in m_t....roll backward

$$m_t = \sum_{i=0}^{t-1} -\theta^s PB + \theta^t m_0$$

but as $t- > \infty$, the RHS$- > \left(-\frac{PB}{1-\theta}\right) < 0$... which cannot be: wealth is insufficient to pay taxes

Intuition: a positive PB destroys non-monetary equilibria

- Assume $PB_t = PB > 0, \forall t$ and non-monetary equilibrium so that $\left(\frac{1}{\Pi_{t-1}}\right) = \theta < 1$
- Then $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB$ is a stable difference equation in m_t....roll backward

$$m_t = \sum_{i=0}^{t-1} -\theta^s PB + \theta^t m_0$$

but as $t- > \infty$, the RHS$- > \left(-\frac{PB}{1-\theta}\right) < 0$... which cannot be: wealth is insufficient to pay taxes

- The individual recognizes taxation as reducing her wealth $=>$ incentive to save $=>$ downward pressure on prices $=>$ fight inflation and push the value of govt. liabilities back up towards the monetary equilibrium

Intuition: a positive PB destroys non-monetary equilibria

- In case of fiscal backing, hence:

Intuition: a positive PB destroys non-monetary equilibria

- In case of fiscal backing, hence:
  - positive return on money is possible $=>$ deflation: $\Pi < 1$

Intuition: a positive PB destroys non-monetary equilibria

- In case of fiscal backing, hence:
  - positive return on money is possible => deflation: $\Pi < 1$
  - $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB$ is stable forward in time: $m_t = PDV(future\ PBs)$

Intuition: a positive PB destroys non-monetary equilibria

- In case of fiscal backing, hence:
  - positive return on money is possible => deflation: $\Pi < 1$
  - $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB$ is stable forward in time: $m_t = PDV(future\ PBs)$
- Note if $PB < 0$.... then $m = -\frac{PB}{1-\theta}$ => link with FTPL?

Intuition: a positive PB destroys non-monetary equilibria

- In case of fiscal backing, hence:
  - positive return on money is possible => deflation: $\Pi < 1$
  - $m_t = \left(\frac{1}{\Pi_{t-1}}\right) m_{t-1} - PB$ is stable forward in time: $m_t = PDV(future\ PBs)$
- Note if $PB < 0$.... then $m = -\frac{PB}{1-\theta}$ => link with FTPL?
- Is optimal policy / or state-contingent taxes changing this fundamental equilibrium property?

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.
- Uses taxes to finance G and inflation to reach efficiency (monetary equilibrium)

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.
- Uses taxes to finance G and inflation to reach efficiency (monetary equilibrium)
- If cannot adjust taxes, then need to use seigniorage to finance $G =>$ trade-off

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.
- Uses taxes to finance G and inflation to reach efficiency (monetary equilibrium)
- If cannot adjust taxes, then need to use seigniorage to finance $G =>$ trade-off
- Intuitively: required seigniorage might be too high if:

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.
- Uses taxes to finance G and inflation to reach efficiency (monetary equilibrium)
- If cannot adjust taxes, then need to use seigniorage to finance $G =>$ trade-off
- Intuitively: required seigniorage might be too high if:
  - 1) taxes are too low: $\frac{\bar{T}}{W} < threshold$

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.
- Uses taxes to finance G and inflation to reach efficiency (monetary equilibrium)
- If cannot adjust taxes, then need to use seigniorage to finance $G => $ trade-off
- Intuitively: required seigniorage might be too high if:
  - 1) taxes are too low: $\frac{\bar{T}}{W} < \textit{threshold}$
  - 2) the govt. is too greedy: λ large

(Unpleasant) Optimal Policy

- Two objectives: 1) finance G; 2) Efficiency: equalize consumption across states
- Two instruments: T_y, m.
- Uses taxes to finance G and inflation to reach efficiency (monetary equilibrium)
- If cannot adjust taxes, then need to use seigniorage to finance $G =>$ trade-off
- Intuitively: required seigniorage might be too high if:
  - 1) taxes are too low: $\frac{\bar{T}}{W} < \textit{threshold}$
  - 2) the govt. is too greedy: λ large
- Remind of Sargent/Wallace

Miscellaneous...to address?

- optimal policy ... no forward-looking

Miscellaneous...to address?

- optimal policy ... no forward-looking
- Essentiality of money!...is OLG the right framework? e.g., money not demanded if there's a productive asset => Kyiotaki/Wright (1989), Lagos/Wright (2003)

Miscellaneous...to address?

- optimal policy ... no forward-looking
- Essentiality of money!...is OLG the right framework? e.g., money not demanded if there's a productive asset => Kyiotaki/Wright (1989), Lagos/Wright (2003)
- dollarization (Cooper and Kempf, 2001) => one monetary eq. disappear / delegating monetary authority

Miscellaneous...to address?

- optimal policy ... no forward-looking
- Essentiality of money!...is OLG the right framework? e.g., money not demanded if there's a productive asset => Kyiotaki/Wright (1989), Lagos/Wright (2003)
- dollarization (Cooper and Kempf, 2001) => one monetary eq. disappear / delegating monetary authority
- legal tender (currency must be accepted for repayment of debt, or to pay taxes)

To conclude

- The problem is that the consolidated government budget constraint features seigniorage which depends on the demand for money which in turn depends on expectations: this tends to create multiple equilibria

"*As Hahn (1965) argued over a half century ago, the absence of a rigorous and realistic theory of money opens up the possibility of multiplicities such as the nonmonetary equilibrium, and this is a continuing discomfort for macroeconomics.*"
(Obstfled and Rogoff, 2017)

- This paper is definitely a step forward towards our understanding of such fundamental and difficult issues.