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Some Unpleasant Monetarist Arithmetic

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Friedman (1968)

- Monetary policy ***could not*** permanently influence the levels of **real output**.
- Monetary policy ***could not*** permanently influence **unemployment**.
- Monetary policy ***could not*** permanently influence **real rates** of return on securities.

Friedman (1968)

Monetary authority could exert substantial control over the **inflation** rate, especially in the long run.

In this Paper …

- It is shown that Friedman's list may be expanded to include ***inflation***.
- It is true even in an economy that satisfies ***monetarist assumptions***.

The key Assumptions …

- There is an upper limit on the real stock and lower limit on the interest rate of government bond.
- Fiscal policy dominates monetary policy; the fiscal authority independently sets its budgets.

Government Constrain

$$D(t) = \{[H(t) - H(t-1)]/p(t)\} + \{B(t) - B(t-1)[1 + R(t-1)]\}$$

- D : Real Budget Deficit
- H : Base Money
- B : Government Bond

It is shown that …

Tighter money now can mean …

- ✓Higher inflation eventually,
- ✓Or even higher inflation now.

Monetary & Fiscal Policies

- $H(t) = (1 + \theta)H(t-1)$ for t=1,2, … T
- $B(t)/N(t) = b_\theta(T)$ for $t > T$
- $D(t)$ is chosen independently.

The First Model

- A common constant growth rate for real income and population of n : $Y(t) = Y(t-1)(1+n)$
- A constant real return on government securities that exceeds n.
- A quantity theory demand for base money, with constant velocity : $H(t)v = P(t)Y(t)$.

Solving Model

- $p(t)/p(t-1) = (1+\theta)/(1+n)$ for t=1,2,…T
- $1 - [1/(1+n)][p(t-1)/p(t)]$
  $= d(t) + \{[R(t-1) - n]/(1+n)\} b_\theta(T)/v$ for t>T

- $b_\theta(T) = \phi(T,1)b(1) + (\sum_{s=2}^{T} \phi(T,s)d(s))$
  $- ([h\theta/(1+\theta)] \sum_{s=2}^{T} \phi(T,s))$
- $\phi(T,s) = \left(\prod_{j=s}^{T-1}[1+R(j)]\right)/(1+n)^{T-s}$

It is seen that …

- For t>T inflation is an increasing function of $b_\theta(T)$ (the upper limit of bond stock) and deficits.
- The bond stock is larger the smaller θ (money growth of first interval) is and the larger deficits are.

Result

Less inflation now, achieved by monetary policy, implies more inflation in the future.

Note to the Two Crucial Assumptions !

A Simplification …

In the First Model :

Any dependence of the demand for base money, on the expected rate of inflation is ignored.

Bresciani - Turroru (1937) and Cagan (1956) :

Found substantial evidence that it exists, by studying countries having rapid inflation.

The Second Model

- A common constant growth rate for real income and population of n : $Y(t) = Y(t-1)(1+n)$
- A constant real return on government securities, that exceeds n.
- **The Cagan's model for money demand, considering expectation of future inflation :**

$$\boldsymbol{H(t)/[Y(t)p(t)] = c_1 - c_2[p^e(t+1)/p(t)].}$$

Solving for Current Price

$$p(t) = 1/c_1 \sum_{j=0}^{\infty} (c_2/c_1)^j \, h(t+j)$$

- The Current Price is expressed in terms of current and future per capita supply of money

Comparison between Models

In the last model:

It is shown that tighter money today causes higher inflation and looser money later.

In this model:

Current price takes effect from future money supply.

It may be possible that, tighter money today, that cause looser money later, increases the present price and inflation.

An Example …

Tight Money: $\theta = .106$ Loose Money: $\theta = .120$

Date (t)	Inflation Rate $[p(t+1)/p(t)]$		Per Capita Bond Holdings $[B(t)/N(t)]$		Per Capita Real Money Balances $\{H(t)/[N(t)p(t)]\}$	
	Tight	Loose	Tight	Loose	Tight	Loose
1	1.0842	1.0825	0.0811	0.0815	0.1202	0.1469
2	1.0841	1.0808	0.1196	0.1180	0.1448	0.1490
3	1.0841	1.0789	0.1592	0.1552	0.1449	0.1514
4	1.0841	1.0768	0.2000	0.1933	0.1449	0.1540
5	1.0841	1.0743	0.2420	0.2321	0.1449	0.1571
6	1.0840	1.0716	0.2853	0.2718	0.1450	0.1606
7	1.0840	1.0684	0.3297	0.3121	0.1450	0.1641
8	1.0840	1.0647	0.3755	0.3532	0.1450	0.1691
9	1.0839	1.0605	0.4227	0.3949	0.1451	0.1744
≥10	1.0839	1.0556	0.4712	0.4372	0.1451	0.1805

Parameters

$\gamma_1 = 3.0$ $\quad R = .05$

$\gamma_2 = 2.5$ $\quad n = .02$

$$d(t) = \begin{cases} .05 \text{ for } t = 1, 2, \ldots, 10. \\ 0 \text{ for } t > 10. \end{cases}$$

$$[H(0) + \tilde{B}(0)]/H(1) = 200/164.65$$

Result

Tighter current monetary policy may fail to temporarily reduce inflation.

Note to the Two Crucial Assumptions !

Conclusion

Until the Fiscal Policy dominates the Monetary Policy …

Monetary Policy can NOT control the inflation!

Question?