

# Monetary Economics

## Lecture 10

### Monetary and Fiscal Policy Interdependence

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# Introduction

- ▶ Fiscal Policy back at the centre of policy discussions
- ▶ Theory of Fiscal Policy not well developed
  - ▶ Ricardian Equivalence (fiscal policy irrelevant) – very present in current debates – see discussion of Cochrane vs Krugman
  - ▶ Old Keynesian (Static Multipliers) do not consider potential effects of expected fiscal and monetary policy response to future fiscal imbalances
- ▶ Modern macro emphasize Inter-temporal Relationships
- ▶ Monetary and Fiscal Policy are not independent as long as one effect expectations about the other
- ▶ Coordination versus Independence

# This Lecture

- ▶ Sargent Wallace Unpleasant Monetarist Arithmetic (first example of studying intertemporal relationship between policy instruments)
- ▶ Fiscal and Monetary Policy coordination – The importance of setting the two policies jointly

# Sargent and Wallace: Unpleasant Monetarist Arithmetic

- ▶ The main objective of the paper was to show that, even in a pure monetarist framework, unbounded fiscal policy produces negative spillover effects on monetary policy, and ultimately it can undermine the ability of monetary policy to control inflation.
- ▶ This conclusion largely based on the “assumption” that permanent budget deficits must be monetized.
- ▶ Not surprisingly, with an exogenous stream of budget deficits, there is only one integral of money creation that is consistent with long run equilibrium, and the only choice in the hand of the monetary authority is the time profile of money creation.
- ▶ Very Simple Model
- ▶ It can explain a lot of Hyperinflation experiences (and their persistence)

# Sargent and Wallace: Unpleasant Monetarist Arithmetic

Basic Argument very Simple

Quantity Theory of Money (given the level of income) where the monetary authority control the growth of base money (and thus of inflation)

$$P_t = \frac{1}{k} M_t \quad (1)$$

The fiscal authority follows an exogenous path of fiscal expenditure  $G_t$  (for  $s = t..∞$ ). The one period budget constraint is therefore defined as:

$$D_{t+1} = (1 + r)D_t + G_t - \frac{M_{t+1} - M_t}{P_t} \quad (2)$$

where the last term define the amount of seignorage.

# Sargent and Wallace: Unpleasant Monetarist Arithmetic

Note that the last term can be expressed in term of the rate of growth of base money

$$\frac{M_t - M_{t-1}}{P_t} = \frac{M_t - M_{t-1}}{M_t} \frac{M_t}{P_t} = \mu_t \frac{M_t}{P_t} \quad (3)$$

Substituting (1) and (3) in (2) we can express the budget constraint as:

$$D_{t+1} = (1 + r)D_t + G_t - k\mu_t \quad (4)$$

# Sargent and Wallace: Unpleasant Monetarist Arithmetic

Integrating (4) forward we obtain the intertemporal budget constraint

$$D_t + \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} G_t = \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (k\mu_s) \quad (5)$$

that, given the constant level of budget deficits and the constant real interest rate , can be rewritten as :

$$D_t + \frac{1+r}{r} G = \sum_{s=t}^{\infty} \left( \frac{1}{1+r} \right)^{s-t} (k\mu_s) \quad (6)$$

From equation (6) is clear that the only choice faced by the Central Bank is to choose the time profile of monetary growth  $\mu$ .

# Sargent and Wallace: Unpleasant Monetarist Arithmetic

For example, if the objective function of the Central Bank is

$$L_{CB} = \sum_{s=t}^{\infty} \beta^{s-t} (\mu_s)^2$$

where  $\mu$  is also the inflation rate (for equation 1), the solution is clearly a constant inflation rate equal to:

$$\mu = \frac{1}{k} \left( \frac{r}{1+r} D_t + G \right) \quad (7)$$

Any other path different from (7) would be non-optimal. In particular any attempt to reduce inflation now without a contemporaneous stabilisation of the fiscal position, would produce higher inflation in the future.

## Sargent and Wallace: Unpleasant Monetarist Arithmetic

Consider for example the case that the central Bank tries to maintain zero inflation until a certain time  $T$ . Therefore in the period  $T$  the government budget constraint would be like:

$$D_T = (1+r)^{T-1} D_t + \sum_{s=t}^T (1+r)^{s-t-1} G$$

and the level of money growth that satisfies the budget constraint from time  $T$  onward will be:

$$\mu = \frac{1}{k} \left( \frac{r}{1+r} D_T + G \right) = \quad (8)$$

$$= \frac{1}{k} \left\{ \frac{r}{1+r} \left[ (1+r)^{T-1} D_t + \sum_{s=t}^T (1+r)^{s-t-1} G \right] + G \right\} \quad (9)$$

# Sargent and Wallace: Unpleasant Monetarist Arithmetic

- ▶ "Without help from the fiscal authorities, fighting current inflation with tight monetary policy must eventually lead to higher future inflation".
- ▶ Very Influential Result
- ▶ Fiscal Rules and Fiscal Constraint comes directly from this theory
- ▶ The policy conflict between fiscal and monetary policy could be resolved assigning policy leadership to the Central Bank.
- ▶ Problem: the only policy objective is controlling inflation: what happens when, as now, the policy objectives are more complex?

# Fiscal and Monetary Policy Coordination

Problem: if monetary and fiscal policy are not independent, is it useful to set the two policies separately?

*Nordhaus "No one would dream of designing the human anatomy by disconnecting the control of the left and the right sides of the body. Yet, for the most important economic controls in a modern economy, monetary and fiscal policies, economists today generally endorse the separation of powers as a way of optimising non inflationary growth"*

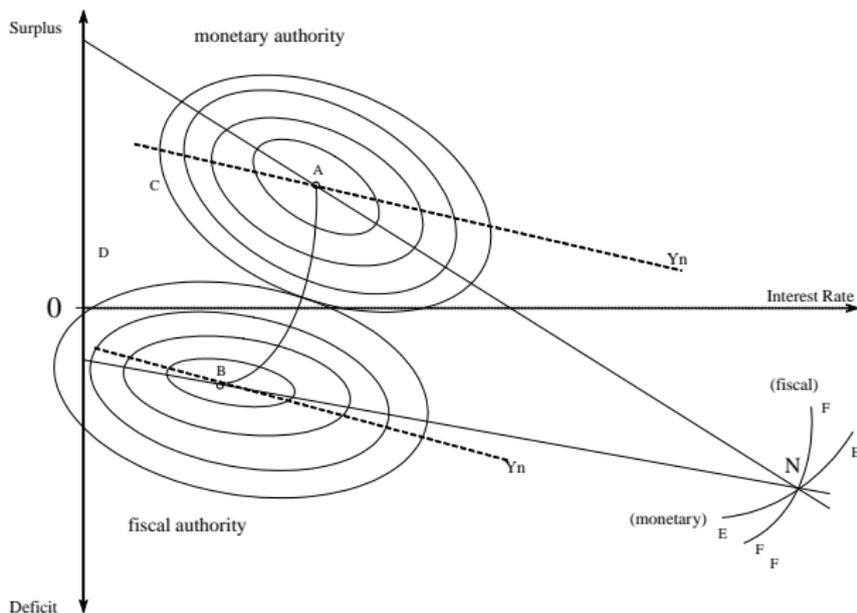
# Fiscal and Monetary Policy Coordination

Monetary and Fiscal Policy feedback on each other  
Different Objectives can produce policy conflict

$$U^F = V^F(u, p, g, S) = U^F(r, S)$$
$$U^M = V^M(u, p, g) = U^M(r, S)$$

# Fiscal and Monetary Policy Coordination

## a graphical analysis



### Explanatory Notes:

1. AB = contract curve for coordination. It provides the incentive compatibility constraint for cooperation, corresponding to that segment of the contract curve which strictly dominates N (the whole contract curve in this diagram). It has to lie within the intersection of the two utility contours marked E and F.
2. A and B = "bliss" points in constrained optimisation space. N = Nash (noncooperative) equilibrium.

# Fiscal and Monetary Policy Coordination

In the Nash Equilibrium (the best uncoordinated response to each other actions)

- ▶ Deficit is Higher than desirable
- ▶ Interest rate is higher
- ▶ Inflation is lower
- ▶ Unemployment (temporarily at least) is higher

*"The fiscal authority attempts to lower unemployment by raising the deficit; this is countered as the monetary authority raises interest rates to fight inflation; and so forth. At the end of this because the two parties pursue their different objectives, the surplus is the big loser"*

# Conclusions

- ▶ Fiscal Policy important in understanding the working of monetary policy
- ▶ Budget Deficit can force monetary policy to monetize debt
- ▶ Policy conflict over different objectives can produce sub-optimal outcomes
- ▶ Coordination between policy instruments made more difficult by independence of Central Banks
- ▶ In crisis time coordination more important (Europe Fiscal Crisis, US unemployment problem, South Africa growth strategy)