Monetary Economics Seigniorage

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• What if the government has persistent deficit?

$$D_t = G_t - T_t > 0$$

• Pay attention to the economic growth.

then

$$B_t = (1+r) B_{t-1} + D_t$$

- so B<sub>t</sub> grows faster than the rate r. By no Ponzi game, the economy would stop lending (buying bonds) or would increase the real interest rates.
- Thus, governments fall into printing money.

- Seigniorage: One possible source of gov't financing
- Government Budget Constraint

$$G_t + (1 + r_t) B_{t-1} = T_t + B_t + M_t - M_{t-1}$$

- It represents the real revenues a gov't acquires by using newly issued money to buy goods and nonmonetary assets.
- The gov'ts seignorage in period t is:

$$S_t = \frac{M_t - M_{t-1}}{P_t}$$

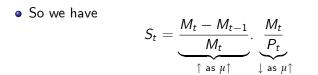
 Historical fact: most hyperinflations stem from the gov'ts excessive reliance on seignorage revenue. Austria, Germany, Hungary, Poland and Russia after WWI. Greece and Hungary (19,800% per month) after WWII. Bolivia 1984.

• Brazil, Turkey, Russia. More recently Zimbabwe and Venezuela, i.e. not a thing of the past.

$$rac{M_t-M_{t-1}}{M_t}=1-rac{1}{1+\mu}=rac{\mu}{1+\mu}$$
 increasing in  $\mu$ 

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•  $\frac{M_t}{P_t}$  is decreasing in  $\mu$ .



• A rise in  $\mu$  does not necessarily augment seignorage.

- There might be a  $\mu$  that maximizes seignorage!
- Therefore, a laffer curve exists.

• Optimum Seigniorage

• We had: 
$$m_t^d - p_t = -\eta E_t \left[ p_{t+1} - p_t \right] \Rightarrow$$

$$\frac{M_t}{P_t} = \left(\frac{P_{t+1}}{P_t}\right)^{-\eta}$$

• As we proved:  $P_{t+1} = (1 + \mu) P_t \Rightarrow$ 

$$\frac{M_t}{P_t} = (1+\mu)^{-\eta}$$

• Seigniorage:

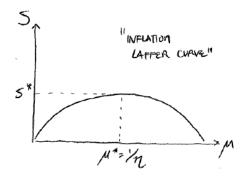
$$S_t = \mu \left( 1 + \mu \right)^{-1 - \eta}$$

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• FOC:

$$\mu^* = \frac{1}{\eta}$$

 The seignorage maximizing rate of money growth depends inversely on the elasticity of real money demand wrt inflation (as η ↑ (the more elastic), μ\* ↓ (so does S\*)).



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