

The International Supply of Liquidity

Pierpaolo Benigno

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Analyze different forms of international monetary system under the lenses of:

- 1 **Efficiency**: supply of liquidity, wedges in money markets;
- 2 **Stability**: macroeconomic stabilization, control of inflation, financial stability.

⇒ Inefficiencies and instabilities are quite pervasive across all regimes...

Narrate inefficiencies and instabilities through analysis of:

- 1 Gold Standard regime;
- 2 Fiat money regime with a self-oriented government:
 - with monetary policy not paying any interest on reserves;
 - with monetary policy paying an interest on reserves;
- 3 Fiat money regime with private supply of liquidity;

where the key perturbation is a worldwide excess demand of the reserve currency

...draw conclusions.

- Supply of reserve currency is fully backed by gold and the central bank is ready to exchange gold at a fixed parity.
- **Inefficiencies:** liquidity is limited being tied to the supply of a tangible scarce asset;
- **Macroeconomic instabilities:** inflation has zero mean, but excess worldwide demand of reserve currency produces deflationary effects which can be de-stabilizing.
- This view is consistent with Keynes' argument to abandon the Gold Standard for UK and Triffin Dilemma for US under Bretton Woods.

The value of money depends on the non-pecuniary benefits that gold provides:

$$\frac{P_t^g}{P_t} = \chi_t L_g(g_t) + \beta \frac{P_{t+1}^g}{P_{t+1}}.$$

$$\frac{1}{P_t} = \theta_t V_q(q_t) \frac{1}{P_t} + \beta \frac{1}{P_{t+1}}$$

$$\theta_t V_q(q_t) = \theta_t^* V_q(q_t^*)$$

$$P_t^g = 1$$

Therefore:

$$\frac{1}{P_t} = \frac{\chi_t L_g(g_t)}{\theta_t V_q(q_t)}$$

- Price level is stationary, average inflation is zero.
- Supply of liquidity below satiation, $V_q(q_t) > 0$ $V_q(q_t^*) > 0$.
- $\theta_t^* \uparrow$ $q_t^* \uparrow$, q_t does not change. g_t (gold privately held) falls then $L_g(g_t) \uparrow$ and P_t falls

Currency with no intrinsic value: a profound discontinuity compared to a backed currency.

Currency becomes merely a claim to itself, making it harder to determine its value.

- **Inefficiencies:**

- A self-oriented supplier of the reserve currency would limit the supply to maintain monopoly rents that improve domestic consumption.
- The limit can be even tighter than a gold standard.

● **Instabilities:**

- In a fiat money regime, the value of a currency requires a real anchor (taxes or assets/remittances).
- Targeting positive inflation can limit the possibility of costly deflations.
- When all high-powered money has a zero interest rate, the supply of liquidity and the inflation rate are intertwined; an excess worldwide demand raises domestic interest rates, contracting the domestic economy.
- When the central bank pays an interest rate on reserves, the central bank can lower interest rates on reserves to insulate the market interest rate, but the zero-lower bound could prevent significant downward movements (see the 2008-2009 financial crisis).

Self-oriented hegemon maximizes:

$$\sum_{t=t_0}^{\infty} \beta^{t-t_0} \{C_t + \theta_t V(q_t)\},$$

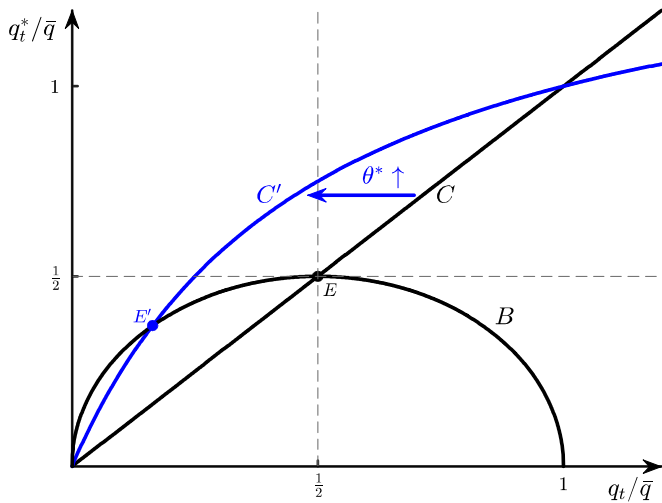
under resource constraints

$$\sum_{t=t_0}^{\infty} \beta^{t-t_0} C_t = -\tilde{q}_{t_0} + \sum_{t=t_0}^{\infty} \beta^{t-t_0} Y_t + \sum_{t=t_0}^{\infty} \beta^{t-t_0} \theta_t^* V_q(q_t^*) q_t^*.$$

and asset-pricing condition

$$\theta_t^* V_q(q_t^*) = \theta_t V_q(q_t)$$

It implies: $V_q(q_t) = V_q(q_t^*) > 0$, **inefficient** supply of international liquidity.



Zero interest rate on reserves: market interest rate and inflation are intertwined with supply of liquidity and external shock:

$$1 + \hat{i} = \frac{1}{1 - V_q(\hat{q})}.$$
$$\hat{\Pi} = \frac{\beta}{1 - V_q(\hat{q})}.$$

Paying an interest rate on reserves: market interest rate and inflation can be insulated from supply of liquidity and external shock, provided zero-lower bound is not reached:

$$\frac{1 + i}{1 + i^R} = \frac{1}{1 - V_q(\hat{q})}.$$
$$\Pi = \frac{\beta(1 + i^R)}{1 - V_q(\hat{q})}.$$

Private intermediaries can create safe securities in the reserve currency to complement government liquidity and take advantage of low financing costs. The backing comes from assets and/or equity.

- **Inefficiencies**

- Unfettered competition in a frictionless market of private money can achieve efficient worldwide allocation.
- Frictions in private-money markets are a source of inefficient supply.

- **Instabilities:**

- There is no issue in anchoring the price level according to the same principles discussed earlier.
- Inflation and interest rates can be completely insulated when private money saturates liquidity.
- When private money markets have frictions, supply and demand shocks affect interest rates and inflation. The central bank can insulate them by adjusting interest rates on reserves, constrained by the zero-lower bound.

- On the demand side

$$V(q_t + \phi_t d_t) \quad V(q_t^* + \phi_t d_t^*)$$

in which ϕ_t represents the quality of private versus public liquidity.
Therefore

$$\frac{1 + i_t^d}{1 + i_t^R} = \frac{1 - \phi_t V_q(q_t + \phi_t d_t)}{1 - V_q(q_t + \phi_t d_t)}$$

- On the supply side

$$B_t^f + \delta_t D_t = D_t$$

Intermediaries invest in private illiquid securities and pay a cost δ_t to produce liquidity. Therefore

$$\frac{(1 + i_t)}{(1 + i_t^d)} = \frac{1}{1 - \delta_t}$$

Frictions in supply and demand determine **inefficiencies** in supply of liquidity and **instabilities**:

- **Inefficiencies**: Supply of liquidity can be below satiation when there are frictions in private intermediation ($\delta > 0$). A fall in the quality of private assets ($\phi \downarrow$) lowers liquidity supply (liquidity crunch):

$$V_q(q_t + \phi_t d_t) = V_q(q_t^* + \phi_t d_t^*) = \frac{\delta_t}{\phi_t}$$

- **Instabilities**: Frictions in the supply ($\delta > 0$) generate spreads in money market. A fall in the quality of private assets ($\phi \downarrow$) raises money market rates and contract economic activity, policy rate can be lowered facing zero-lower bound constraint:

$$\frac{(1 + i_t)}{(1 + i_t^R)} = \frac{\phi_t}{\phi_t - \delta_t} \quad (1)$$

- **Monopolists** do not have an incentive to provide efficient liquidity supply, and the creation of **private liquidity** can be subject to information costs for ascertaining the quality of securities.
- Private currency **competition** could potentially offer better currencies in the near future, and individuals may transition to currency systems that transcend national borders.
- The **best currency** would be one that:
 - Maintains the stability of its value.
 - Is not subject to fiscal or financial dominance.
- Liquidity could be supplied privately, as blockchains could evolve to enable **cryptographic-guaranteed** assessments of securities. This would provide users with trustworthy information about the quality of financial securities, which is more accurate, accessible, and auditable than current alternatives (such as rating agencies).