

Comments on

"When Does a Central Bank Balance Sheet Require Fiscal Support"
by Marco Del Negro and Christopher A. Sims

Andreas Schabert
University of Cologne

I SUMMARY

II COMMENTS

Topic

- Main questions
 - Does the central bank balance sheet matter?
 - What are the consequences for fiscal backing for the CB?

- Fed's practice: No remittances to the treasury if net income gets negative
 - CB books a deferred asset (negative liability, e.g. in Nov. 2011)
 - Reduction in the future liabilities to the treasury
 - Deferred asset without any consequences for conducting monetary policy

DNS's paper

- Contribution
 - Microfounded and quantitative analysis of central bank solvency

- Main insights
 - Fiscal backing only required if the central bank is insolvent
 - Unlikely that PV of seigniorage is smaller than negative net worth
 - CB may need recapitalization to maintain commitment to rule/target
 - Without fiscal backing, inflation expectations might be self-fulfilling

Set-up

- Open economy with exogenous fixed real rate, no uncertainty, fully flexible prices

- Households
 - Hold foreign assets, currency, long-term treasury debt and short-term deposits
 - Non-interest bearing currency M tend to reduce transactions costs
 - Pecuniary return from long-term debt B^P and deposit liabilities V are identical
 - Inflation scare x (perturbation of private agents inflation expectations)
 - Possibility of discontinuous jumps in the price level

Central bank I/II

- Buys long-term treasury debt by issuing short-term debt (deposit liabilities)
 - Assets acquisition according to an exogenous process

$$B_t^C = \bar{B}_t^C$$

- Pays interest on deposits (excess and required reserves)
 - Sets interest rate on reserves r according to an inertial Taylor rule
 - Further accommodates demand for non-interest bearing currency
- Pays remittances τ_t^C to the treasury.

Central bank II/II

- Central bank intertemporal budget constraint

$$\underbrace{\frac{V_0}{P_0} - q \frac{B_0^C}{P_0}}_{\text{Initial liabilities}} = \underbrace{\int_0^\infty \left(\frac{\dot{M}_t}{M_t} + n \right) \frac{M_t}{P_t} e^{-\int_0^t \tilde{r}_s ds} dt}_{\text{PV of seigniorage}} \quad (\text{IBC})$$

$$- \underbrace{\int_0^\infty \tau_t^C e^{-\int_0^t \tilde{r}_s ds} dt}_{\text{PV of remittances}}$$

where $\tilde{r}_t = \rho_t + x_t - n$.

- Seigniorage increases with inflation and decreases with the interest rate
 - When PV of seigniorage is not sufficiently large, CB needs fiscal backing

Fiscal policy

- Treasury

- Issues long-term debt, $B_t = B_t^P + B_t^C$

- Lump-sum tax depends on total public debt held by the private sector

$$\tau_t = \phi_0 e^{\gamma t} + (\phi_1 + n + \gamma) \left[q_t \frac{B_t^P}{P_t} + \frac{V_t}{P_t} \right]$$

- $\phi_1 > \beta - n$: *Passive* fiscal policy for consistency with private agent's TVC

- Exogenous government spending

A special case of the Fiscal Theory

- When the central bank issues deposit liabilities independent of assets
 - Interest bearing liabilities might exceed interest bearing assets
- When seigniorage does not close this gap, liabilities grow with the interest rate
 - Price level has to adjust to restore consistency with private sector behavior

Inflation scare in the "simple model"

- Inflation expectations jump by 1%, inducing for a higher nominal rate
 - Price of long-term bonds q falls according to the arbitrage freeness condition

$$\frac{\chi + \delta}{q} - \delta + \frac{\dot{q}}{q} = r$$

$$\Rightarrow q_0 = (\chi + \delta) \int_0^{\infty} \exp\left(-\int_0^t r_s ds + \delta t\right) dt$$

- CB might require capital injections $\tau^C < 0$ if $V - qB^P > PV$ of seigniorage
 - Only for an "unrealistically large" balance sheet and a long average duration

Full model

- Main experiment: Real rate increases from a low level to its steady state value
 - Nominal rate and inflation also increases according to the Taylor rule
 - Initial price of long-term bonds q_0 above its steady state value
 - CB's initial net wealth *above* par value
- Further experiments: Inflation scare and explosive interest rate paths
 - Further increase in nominal rates tends to reduce asset value q_0
 - Increase in interest bearing deposits due to reduced currency holdings
 - CB remains *solvent* as seigniorage compensates for negative net wealth

TABLE 3. Central bank's resources under different simulations

	(1)	(2)	(3)	(4)	(5)
	$\frac{qB/P}{-V/P}$	PDV seigniorage	(1)+(2)	q	\bar{B}/B
Baseline calibration					
(1) Baseline scenario	0.146	1.139	1.285	1.08	
(2) Higher rates (β)	0.130	0.181	0.311	1.06	12.62
(3) Higher rates (γ)	0.141	1.443	1.584	1.06	60.23
(4) Inflation scare	0.028	0.692	0.720	0.85	4.15
(5) Explosive path	0.069	0.466	0.535	0.85	3.28
Higher θ_π					
(6) Inflation scare	0.048	0.599	0.647	0.90	4.54
(7) Explosive path	-0.010	0.175	0.165	0.61	1.34
Lower θ_π					
(8) Inflation scare	-0.070	0.861	0.791	0.47	2.69
(9) Explosive path	0.135	6.806	6.942	1.05	199.41

Self-fulfilling solvency crisis

- Stabilization relies on a policy regime that might require fiscal backing
 - If CB switches policy to increase seigniorage, multiple equilibria are possible
- An alternative expected inflation target path
 - CB temporarily deviates from target, such that (IBC) is binding: $PV(\tau^C) = 0$
 - Negative net wealth filled with increased seigniorage under higher inflation
 - Multiplicity possible under large balance sheets and implosive interest paths

I SUMMARY

II COMMENTS

1. Comment: Balance Sheet I/II

- Neglecting capital, CB balances sheet is $Reserves + Currency = Assets$:

$$V_t + M_t = q_t B_t^C \quad (\text{BS})$$

Reserve balances change mechanically with changes in assets

- while changes in currency are off-set by reversed changes of reserves.

- In DNS, this is almost satisfied in the initial period $V_0 + M_0 \approx q_0 B_0^C$.

- However, this constraint not assumed throughout the paper

- Instead, they consider:

"issuing new interest bearing reserve deposits there would be no flow of earnings from assets offsetting the new flow of interest on reserves" ...

"net liabilities would begin growing at approximately the interest rate."

1. Comment: Balance Sheet II/II

- CB is assumed to buy assets according to $B_t^C = \bar{B}_t^C$
 - Any reduction in currency demand raises interest bearing liabilities
 - No change in the size of the balance sheet

- Applying (BS) to the CB budget constraint

$$q_t \frac{\dot{B}_t^C}{P_t} - \frac{\dot{V}_t + \dot{M}_t}{P_t} = (\chi + \delta - \delta q_t - n q_t) \frac{B_t^C}{P_t} - (r_t - n) \frac{V_t}{P_t} + n \frac{M_t}{P_t} - \tau_t^C$$

and the arbitrage condition $\chi + \delta - \delta q + \dot{q} = r q$, would imply

$$\tau_t^C = r_t \cdot M_t / P_t$$

Remittances would be a function of the nominal interest rate and real currency.

- Multiple equilibria based on indetermined remittances might be impossible.

2. Comment: Role of Reserves

- No particular role of interest earning reserves (in contrast to currency)
 - Agents indifferent between holding long-term bonds and short-term reserves
 - No term premium between returns on bonds and reserve balances

- Aren't reserve balances (i.e. federal funds) something special?
 - Liquidity of reserves implies wedge between yields on bonds and reserves
 - Wouldn't this help calibrating the transactions cost function?

3. Comment: Interest on reserves

- Interest on reserves close or below (in 2008) to the federal funds rate target
 - Introduced to improve the Fed's control of the federal funds rate
 - No requirement to set the interest on reserves equal to the target rate

- When the target rate is increased according to the CB's rule
 - Interest on excess reserves (IOER) can easily be reduced or abandoned

- Fixed rate (reversed) repurchase agreements
 - When the Fed conducts fixed rate (reverse) repos, IOER might not be relevant
 - Earnings/payments from repos and reverse repos (instead of IOER)

4. Comment: Tax rule

- Taxes respond to treasury debt held by the private sector and CB debt

$$\tau_t = \tau \left(q_t \frac{B_t^P}{P_t} + \frac{V_t}{P_t} \right) \quad (\text{TR})$$

If, for example, (BS) holds and using $B_t = B_t^C + B_t^P$, (TR) would imply

$$\tau_t = \tau \left(q_t \frac{B_t}{P_t} - \frac{M_t}{P_t} \right)$$

- Why does the government not only care about its own total debt?

$$\tau_t = \tau \left(q_t \frac{B_t}{P_t} \right)$$

Would this affect the possibility of self-fulfilling solvency crisis?

Comment on the manuscript

- Section VI: Inflation scare in the simple model
 - There are no deposit liabilities and no long-term assets in the simple model
 - Just focus on the full model