Discussion of Giancarlo Corsetti & Luca Dedola’s

The Mystery of the Printing Press:
Self-fulfilling debt crises and monetary sovereignty

by Ramon Marimon

European University Institute and UPF – Barcelona GSE,
and CEPR & NBER

Banque de France, December 17, 2012
The aim of the paper:
The aim of the paper: not very ambitious
The aim of the paper: not very ambitious

• To disproof a claim of a syndicated journalist!
The syndicated journalist:
The claim:

*The proposition [is] that countries without a printing press are subject to self-fulfilling crises in a way that nations that still have a currency of their own are not.*

The strength of the paper:
The strength of the paper:

- Builds on the work of an imaginative economist!
The imaginative economist:
Calvo’s lessons (1988)

- Two conditions to obtain self-fulfilling debt crisis (equilibria with (partial) debt repudiation driven by expectations):
  1. A government with limited commitment.
  2. The cost of repudiation dependent on the size, or the fraction, of the repudiated debt.
     (with independent costs equilibrium are typically unique)

- This is true whether there is explicit or – through monetization – implicit (partial) debt repudiation.
  (difference: dependence is on size (explicit) versus fraction (implicit))

- Commitment devices can kill self-fulfilling equilibria.
  (examples: price indexation and/or interest-rate ceilings)
C&D 25 years later

• We have learned few things in these years:

  – Dynamic models of fundamental debt repudiation: Arellano (2008), etc.
  – A little more about self-fulfilling debt crisis: Cole and Kehoe (2000), etc.

• The C&D contribution

  – A simple combined model of fundamental + self-fulfilling
    (fundamental: fixed cost of default & default only when fundamentals are weak)
  – As in Calvo, explicit and implicit (monetization) debt repudiation.

_The main lesson is that the ability to print money is not sufficient to rule out self-fulfilling debt crisis._ (C&D, 2012)
The R&R evidence is not in favor of the claim:

Figure 8a Domestic and External Crises and Prices and Inflation
(Price Level, t-4 = 100, all episodes)
The R&R evidence is not in favor of the claim:

Figure 8b Domestic and External Crises and Prices and Inflation
(Price Level, t-4 = 100, excluding hyperinflation episodes)
C&D 25 years later: the extended Calvo model

- In period 1 (0) consumers invest either in government bonds, $B$, or capital, $K$.

- In period 2 (1) (state $i$, $i = L, H$) they get income $Y_i$ and $B \tilde{R}$ and $KR$.

- In 1 the government issues $B$ and in 2 levies $T_i$ to finance $G$ and payback the debt.

- It may apply a haircut of $\theta_i \in [0, 1]$, at cost $\alpha \theta_i B \tilde{R}$, $\alpha \in [0, 1]$.

  $$T_i = G + (1 - \theta_i)B \tilde{R} + \alpha \theta_i B \tilde{R}$$
  
  i.e.,

  $$T_i = G + B \tilde{R} - (1 - \alpha) \theta_i B \tilde{R}$$

- Deadweight loss of $z(T_i, Y_i)$ and of default $\xi_\theta$, $\xi_0 = 0$, $\xi_\theta = \xi > 0$ if $\theta \in (0, 1]$. 
C&D 25 years later: the extended Calvo model

\[ C_i(T_i, \theta, \xi_\theta) = [Y_i - z(T_i) - \xi_\theta] + KR + (1 - \theta_i)B\tilde{R} - T_i \]  \hspace{1cm} (2)

i.e., \[ C_i(T_i, \xi_\theta) = [Y_i - z(T_i) - \xi_\theta] + KR + B\tilde{R} - \frac{B\tilde{R} + G - T_i}{1 - \alpha} - T_i \]

• Assume, for the moment, that \( z(T_i, Y_i) = z(T_i) \).
The uncommitted benevolent government

• Let

\[ \tilde{T}_i = \arg \min_{T_i} \left\{ z(T_i) - \frac{\alpha}{1 - \alpha} T_i \right\} \]

s.t. \[ G + \alpha B \tilde{R} \leq T_i \leq G + B \tilde{R} \]

• Therefore, \( \tilde{T}_H = \tilde{T}_L = \tilde{T} \).

• Let \( \hat{T} = G + BR \) (full payment of liabilities). Then,

\[ T^* = \arg \max_{\{\hat{T}, \tilde{T}\}} \left\{ E_{\mu}C(\hat{T}, \xi_\theta), E_{\mu}C(\tilde{T}, 0) \right\} \]
Back to the *Calvo model*. The case $T^* = \tilde{T}$
Arbitrage-Equilibrium conditions:

\[
[\mu ((1 - \theta_H) + (1 - \mu)(1 - \theta_L))] \tilde{R} = R
\]  \hspace{1cm} (3)

\[
\text{i.e. } [\mu \theta_H + (1 - \mu) \theta_L] \tilde{R} = \tilde{R} - R
\]

\[
T^* = \mu T^* + (1 - \mu) T^* = G + B\tilde{R} - (1 - \alpha) [\mu \theta_H + (1 - \mu) \theta_L] B\tilde{R} = G + (1 - \alpha) BR + \alpha B\tilde{R}
\]  \hspace{1cm} (4)

• Therefore, there is no fundamental debt crisis.
Back to the Calvo model. The case $T^* = \tilde{T}$
Not exactly back to the **Calvo model.**

- Recall that
  \[
  T^* = \arg \max_{\{\tilde{T}, \hat{T}\}} \left\{ E_\mu C(\tilde{T}, \xi_\theta), E_\mu C(\hat{T}, 0) \right\}
  \]

- For $\xi$ large enough there is no self-fulfilling debt crisis (i.e. equilibrium is unique).
Not exactly back to the Calvo model.

- The painful taxation assumption:

\[ z(T, Y_L) > z(T, Y_H) \]
\[ z'(T, Y_L) > z'(T, Y_H) \]

- Furthermore, assume that:
  - the government can not insure the Low state;
  - debt, \( B \), is so high that \( \tilde{T}_L < G + BR \),
  - but the High state is so good that \( \tilde{T}_H > G + BR/\mu \)
Back to the **Calvo model** in the $H$ state.
C&D 25 years later also show that:

• for a set of parameters *fundamental* and *self-fulfilling* can coexist in $H$ and $L$;

• the equilibrium may also be unique (already said, for high $\xi$);

• as in Calvo, since monetization is a haircut, the monetary model behaves similarly;

• as in Calvo, they also discuss commitment devices and, realizing that interest-rate ceilings may not be credible, they move to: *the central bank as a credible institution*:
  – ‘the CB can commit to state contingent policies’ (the government no).
  – ‘the CB can use *default free* monetary liabilities’ (the governments no).

but this (interesting) discussion is beyond the model, being part of the discussion on...
Chicken games
Is the discussion of ‘the journalist claim’ over?

- **YES**: it is not supported by evidence and it doesn’t pass the (current) theory test.
- **NO**: there are still open questions on the *inflation vs. partial default* issue:
  - is there a difference in the run-up of the credit boom?  
    (in the Calvo, and C&D, model the level of debt is exogenous).
  - are hard defaults more likely when soft defaults (monetization) are not feasible?  
    (this complementary question to the latter is Jean Tirole’s question of this morning,  
    but R&R evidence is not very supportive of its relevance).
  - why is there resistance against wage reductions and tax increases and there is almost none when the tax is the *inflation tax*?  
  - is there a non-equivalence when ex-post income & damage distribution is accounted for?
As usually said,
As usually said,

I enjoyed going through the C&D paper
Thanks!