Contingent Debt Currency

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Debt crisis

- Set of borrowers with excessive debt
  - households (mortgages)
  - financial institutions
  - corporations, small firms

- Debt-inflation would be good...
  but costly

- Can we get some of the gains of debt deflation without the costs?
Proposal

- a dual currency system
  - C-dollars (or Convertible Debt Currency)
  - N-dollars

- prices, wages, contracts denominated in N-dollars
- debt contracts mostly denominated in C-dollars

- fixed exchange rate (1:1) in normal times
- devaluation of C-dollars in crisis
Plan

• Why public provision of state-contingency?

• Details of the scheme

• Issues:
  • Speculative attacks
  • Intermediation, currency mismatch, maturity mismatch
  • Fixed or floating exchange rate?
Debt restructuring: private vs social gains

• One period model

• Entrepreneurs have to repay debt $d$ to lenders

• Choose effort $e$ which determines probability of success $\phi(e)$
  • if success: assets’ value $v > d$
  • if fail: assets’ value 0, default
Private restructuring

Unobservable effort, the entrepreneur’s payoff is:

\[ \phi(e)(v - d) - e \]

Concave \( \phi \), optimality condition

\[ \phi'(e)(v - d) = 1 \]

For the lender optimal to restructure the debt contract if expected repayment

\[ \phi(e)d \]

is decreasing in \( d \)
Private restructuring

\[ \phi(e)(v-d)-e \]

Privately efficient restructuring

lender’s utility

borrower’s utility

\[ \phi(e)d \]
Externality

The value of the asset depends on the aggregate fraction of successful projects $\Phi$

In equilibrium $\Phi = \phi(e)$ but borrowers and lenders do not take it into account when restructuring

With $v'(\Phi) > 0$

Social value of restructuring $> \text{private value}$
Public restructuring

$\varphi(e)d$

lender’s utility

socially efficient restructuring

$\varphi(e)(v-d)-e$

borrower’s utility
Externalities

- through asset prices (specialists’ net worth)
- through effects on lending among financial market participants
- through effects on aggregate activity

Coordination problem in restructuring at the market level, at the economy level
Lack of state contingency

Introduce shock: $s \in \{h, l\}$

Value of assets

$v_s(\Phi)$

Same mechanism can explain why private gains of state contingent debt may be smaller than social gains

Cost of writing state-contingent contract

A CDC scheme helps reduce this cost
Lack of state contingency (continued)

Corporate finance: benefit of debt contract as discipline device

However, not many models of why debt not contingent on observable, aggregate conditions

Two views:

- non-state-contingent optimal: need more discipline when aggregate event happens (maybe to discourage creation of correlated risks)
- non-state-contingent because contingent has small private gains, coordination elements

Here we clearly take the second view
The Scheme

- In normal times exchange rate 1
- If some measure of capitalization in the financial system goes below some level, devalue CDC by $1 - \Delta$
- Legally debt contracts can be discharged either in N-dollars or in C-dollars, at the borrowers discretion (reverse of gold clause)
- In crisis, the CB supplies CDC at 1 per $1 - \Delta$ dollars
- Borrowers can go to CB exchange N-dollars for C-dollars and pay their debt with C-dollars
Questions

• **What is debt?**
  Tax law links debt to interest deductability, we keep that definition, which builds in a subsidy for state-contingency. Includes residential mortgages and financial sector debt.

• **Would firms try to opt out of such debt?**
  Status quo contract has the contingency feature built in. A firm has to do something special to get out of it. With non-financial loans in CDC, the financial sector has assets in CDC and it is in their interests to do asset/liability management and choose to denominate their debts in the same fashion.
Questions (continued)

- *Does the scheme create moral hazard for borrowers?*

  Any insurance scheme will lead to an endogenous response by the private sector.

  The advantage here is that the insurance is priced by lenders and so borrowers will be paying for the insurance benefits they receive.
Questions (continued)

- *Can the central bank commit to use this tool prudently?*

  We see this as better solution relative to debt-reduction transfers implemented using fiscal policy

  Rule-based behavior with gains in credibility and independence

  The proposal piggy-backs on the success of central banks at inflation targeting
Questions (continued)

- *Will lenders be happy to hold C-assets?*

Leveraged financial lenders with liabilities in C-dollars: yes

However some lenders want ‘real’ safe assets
This open the door to the business of currency-transformation:
Banks that specialize in transforming C-dollar assets into N-dollar liabilities

Financial institutions have option:
- C-dollars liabilities, light regulation
- N-dollars liabilities, heavy regulation
Questions (continued)

- **Will the additional risk premium of debt avoid a build up of credit bubbles?**
  
  In theory yes

  However concerns that the risk premium on debt during the build-up of credit bubble might still be small and only spike when the bubble is about to burst (similar to recent behavior of CDS spreads)

  Scheme not substitute for regulation, but CB can send early signals on possibility of realignment (stronger tool than moral suasion/warnings of irrational exuberance)
Questions (continued)

- How similar is the scheme to emerging market, where borrowers contract in both local and foreign currency? Important difference is that both currency interest rates are under the control of the same central bank

Similarity and differences

Good news is: emerging markets have successfully steered borrowers away from dollarized debt and towards domestic currency debt

More on speculative attacks
“At the end of every seven years, you must cancel debts...

Be careful not to harbor this wicked thought: ‘The seventh year, the year for canceling debts, is near,’ so that you do not show ill will toward your needy brother and give him nothing.”

Deuteronomy 15:1,9 (via Kroszner)
Speculative attacks

Two periods 0 and 1
Shock $s \in \{ h, l \}$
At 0 borrowers have debt $d_0$ to roll over
\[ d = (1 + r) d_0 \]
Non-state contingent debt $d$
Net worth
\[ n = v_s - d \]
Speculative attacks (continued)

Lenders risk neutral and have alternative safe investment at rate $1 + i$

Arbitrage condition (UIP)

$$1 + i = E[(1 + r)\phi X]$$

where $X$ is the exchange rate N-dollars per C-dollar

*Policy rule*: when $n$ below some cutoff $\hat{n}$ intervene and devalue nominal debt by $\Delta$
Policy induced multiplicity

*Run*: an increase in $r$ which justifies ex post a reduction in $X$

Multiplicity due to the policy response

\[
ns = vs - (1 + r)d_0 < \hat{n}
\]

\[
1 + r = \frac{1 + i}{(1 - \pi)\phi_h + \pi\phi_l(1 - \Delta)}
\]

Usual effect as in Obstfeld (1994), plus additional feed-back through effort and risk premia
Eliminating the bad equilibrium

How to solve the problem?

1. Preemptive devaluation

make the rule contingent on both $n$ and $r$

*Policy rule*: if $n$ goes below some cutoff or $r$ above some cutoff then depreciate

as $r$ increases towards bad equilibrium depreciation happens early on, “steam release”

But then running is not an equilibrium

$$n_s = v_s - (1 + r)(1 - \Delta)d_0$$
Preemptive devaluation

\[ n \]

\[ \hat{n} \]

net worth

devalue \( d_0 \)

interest rate

net worth
Eliminating the bad equilibrium (continued)

2. Use regular monetary policy

Intervene directly on UIP condition changing $i$

Modify the standard monetary policy rule (for $i$) to respond to $r$

Unlike in standard exchange rate defense here CB has power on both sides
Interest rate policy

Interest rate policy diagram with axes labeled as follows:
- $n$ for net worth
- $\hat{n}$ for lower $i$
- $r$ for interest rate
Not-policy-driven debt runs

Notice that debt runs do not need to be policy induced

High $r$ triggers low effort $\rightarrow$ low $v$ $\rightarrow$ feedback $\rightarrow$ justifies high $r$ ex ante

The channel is all through the risk premia and the macro-externality

$$1 + r = \frac{1 + i}{(1 - \pi) \phi_h + \pi \phi_l}$$
Debt runs

\[ \phi \]  
interest rate 
inverse risk 
premium
Not-policy-driven debt runs (continued)

Now the dual currency regime can help eliminate the bad equilibrium

Similar as in policy-induced runs

Again, rule dependent on $r$ is key
Currency mismatch

- Will there be tendency to mismatch, offer N-assets?
- Yes, regulated banks will specialize in this transformation
- Also, borrowers allowed to get around the C-denomination, so safe borrowers can choose that option
- Crucial target: high-leverage “speculative” financial activity mostly financed with C-dollars
Currency mismatch (continued)

- Interconnected borrowers-lenders will use C-dollars as unit of account
- Little tension towards mismatch here
- However two open issues (both to do with maturity)
  - Short-term borrowing (Repo) gains less from the plan, as $r$ has time to adjust as we approach full crisis here feedback with $r$ helps to avoid runs, but may lead to premature response
  - Maturity mismatch is amplified
Maturity mismatch

- Agent has 100 asset in 2 periods and 100 liability in 1 period
  - Probability of devaluation increases, still needs to rollover 100 short debt while his asset falls in value by $d\pi \times \Delta$
  - Banks good at hedging interest rate risk, although here intermingled with currency risk
  - The problem gets harder with *liquidity risk*: harder to roll-over for borrower specific reasons (the $\phi$ part)
  - So financial institutions with CDC liabilities still need oversight
  - not a substitute for regulation, an additional tool for intervention
Floating?

- In principle, when designing system, one tempted to go more sophisticated
- Freely floating two-currency regime (gold/silver)
- Disadvantage is risk of ending up in “dirty float”
- Well defined rule seems essential ingredient
Revaluation

Related issue is how to go back to normal?

If private sector anticipates $X_3 = 1$ will hoard C-dollars at $t = 2$

The central bank can counter with a negative interest rate on CDC (fine since CDC only electronic money)

Interest rate of $-\Delta$ does the job
Conclusions

- idea for adding a tool to monetary policy
- tool based on unit-of-account role of money
- rules need experimentation to be learned, how to do it with rare events? simplicity of rule seems important
- essentially automatic debt pardon, universality here is good