Assessing the Appropriate Size of Relief in Sovereign Debt Restructuring

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- What's the "appropriate" size of relief in a sovereign debt restructuring process?

- The ultimate goal of a sovereign restructuring is the restoration of *debt sustainability*

    - But there may be more relevant constraints than just the government's transversality condition for defining *debt sustainability*

        - Principles-based approach for assessing debt sustainability

- Evidence shows that sovereign debt restructuring processes are being ineffective at restoring sustainability

t	3	4	5	6	7
Fraction	0.497	0.525	0.553	0.575	0.6

- Fraction: denotes fraction of restructuring with private creditors (bondholders and bank loans) followed by another restructuring or default with the same group within t years

- Evidence shows that sovereign debt restructuring processes are being ineffective at restoring sustainability

t	3	4	5	6	7
High Income	0.619	0.650	0.700	0.700	0.700
Upper Middle Income	0.500	0.548	0.578	0.590	0.622
Lower Middle Income	0.467	0.477	0.500	0.523	0.548
Low Income	0.455	0.455	0.469	0.531	0.548
Total	0.497	0.525	0.553	0.575	0.6

- Fraction: denotes fraction of restructuring with private creditors (bondholders and bank loans) followed by another restructuring or default with the same group within t years

- Evidence is very suggestive of a too little syndrome

  - Suppose that the actual probability that a restructuring with private creditors is followed by another restructuring or default with the same group within five years is 0.05, and that that variable follows a Poisson distribution

  - Then, probability of observing *Fraction* = 0.553 for $t = 5$ (i.e. probability of observing 95 failed attempts at resolving the sovereign debt crises in a sample of 179 episodes) would be equal to $5.37x10^{-62}$ – an extremely rare event

- Flawed approach: Inter-country comparison of market haircuts (Edwards 2015)

    - 180 restructuring episodes with private creditors from 1970 to 2010 (data from Cruces-Trebesch 2013)

    - Actual haircuts vs. Predicted haircuts

    $$H_t = 1 - \frac{PV \ new \ bond(r_{t+\epsilon})}{PV \ old \ bond(r_{t+\epsilon})}$$

    - If actual haircut $>> (<<)$ predicted haircut $\implies$ too much (too little) haircut

The relief is appropriate if it restores sustainability
with high probability

A methodology for assessing the appropriate size of relief in sovereign debt restructuring

- Define the relevant constraints:

  - The Government's Intertemporal Budget Constraint (GIBC)

  - The principles-based constraints

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- First, define GIBC:

$$d_t^* = \sum_{j=0}^{\infty}[1 + r(t, t+j)]^{-1}s_{t+j}|z_{\infty}^i$$

with

$$1 + r(t, t+j) = \Pi_{k=0}^{j}(1 + r_{t+k})$$

and TC:

$$lim_{j\to\infty}[1 + r(t, t+j)]^{-1}d_{t+j}|z_{\infty}^i$$

- Suppose:

$$s_t = s(\gamma_t, R_t, X_t^s, \epsilon_t^s)$$

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- For each possible economic scenario, find the trajectory of fixed points for the primary fiscal balance that satisfies GIBC

Definition 1

The set of <u>economically feasible</u> s_t is defined as
$J^E = \{s_t : \gamma(s_t, X_t^\gamma, \epsilon_t^\gamma) > -1 \ \wedge \ R(s_t, X_t^R, \epsilon_t^R) > \gamma(s_t, X_t^\gamma, \epsilon_t^\gamma)\}$

Definition 2

s_t^* is an <u>economically feasible fixed point</u> if $s_t^* \in J^E$

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- Check if each trajectory of fixed points respects the constraints imposed by the principles (political feasibility)

  - Trajectories of fixed points for the primary fiscal balance that the GIBC and the constraints imposed by the principles are feasible

Definition 3

The set of politically feasible s_t is defined as J^P

Definition 4

s_t^* is a politically feasible fixed point if $s_t^* \in J^P$

Definition 5

s_t^* is a feasible fixed point if $s_t^* \in J^F = J^E \cap J^P$

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- If there is a "sufficiently large" mass of *feasible* trajectories of fixed points, then the debt state satisfies sustainability with high probability

- Otherwise, there is need for a debt write off large enough as to achieve a "sufficiently large" mass of *feasible* trajectories of fixed points

Definition 6

$d_{t-1,t}$ is <u>x-sustainable</u> if given the probability distributions for ϵ_t^i $(i = s, \gamma, R)$, there are $\{s_t^*\}_t \in J^F$ s.t. GIBC holds with probability mass not smaller than x

Definition 7

Suppose GIBC holds with probability $x' < x$ for d_t^*. Then, the <u>appropriate level of debt relief</u>, Δ, must satisfy $\Delta = d_t^* - d_t^{*'}$, where $d_t^{*'}$ is the maximum value of d that satisfies x-sustainability

A methodology for assessing the appropriate size of relief in sovereign debt restructuring:

An illustration of how to apply it

- Commonly invoked object in practical episodes of restructuring: the debt-stabilizing constant fiscal surplus to GDP ratio

- Suppose $\gamma_t = \gamma$, $R_{t,t+1} = R$, both r.v. ex-ante

- Let γ^n and R^n be any possible realization of γ and R
  $\implies$

$$s^n = d_t^* \left(\frac{R^n - \gamma^n}{1 + \gamma^n} \right)$$

- Suppose

$$\gamma^n = \alpha_0 - \alpha_1 s^n$$

$$R^n = \beta_0 - \beta_1 s^n$$

- α_i and β_i have discrete uniform distributions:
  $\alpha_0 \sim unif(0.02, 0.07)$ with $pmf = 1/6$; $\alpha_1 \sim unif(0, 1)$ with
  $pmf = 1/11$; $\beta_0 \sim unif(0.03, 0.07)$ with $pmf = 0.2$;
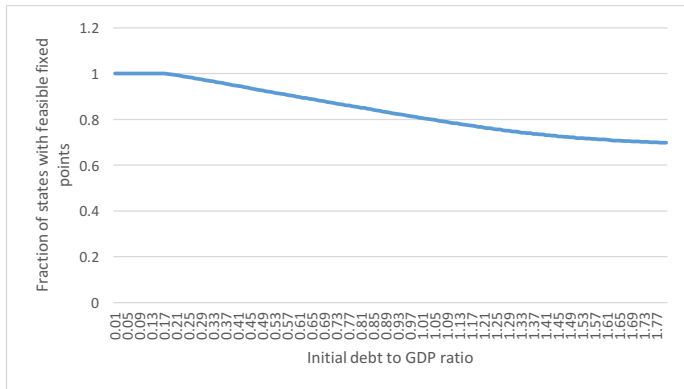 $\beta_1 \sim unif(0, 101)$ with $pmf = 1/101$

- Under our distributional assumptions, $N = 33,330$ combination of states

- Compute s^n for each n, for $d_t^* \in [0.01, 1.8]$

    - Multiple fixed points

1. Eliminate dynamically inefficient combinations

2. Count scenarios where there is at least one economically feasible fixed point

3. Political feasibility: suppose
   $J^P = \{s_t \in (-1, 1) : \gamma(s_t, X_t^\gamma, \epsilon_t^\gamma) \geq 0.01\}$

4. Count scenarios where there is at least one politically feasible fixed point

5. Compute ratio of relevant scenarios with feasible fixed point

- x-sustainability:

- Appropriate relief, $x = 0.95$

- Computing the appropriate non-contingent relief requires knowledge on the distribution of fiscal multipliers

- Framework is complementary of IMF Fan Charts Approach
  (Abiad-Ostry 2005; Celasun-Debrun-Ostry 2006)

  - Fan Chart analysis helps to rule out via stress tests unusual predictions regarding variables over which uncertainty is high

- Need for clarifying what's a sensible framework for assessing how appropriate is a debt write-down

- Evidence that suggests presence of *too little* syndrome in sovereign debt restructuring

- Possible guide for practitioners

    - Framework could be the basis for the codification the UN *sustainability principle*