GWU GEFRI Conference

Comments for session on:

"Modeling and Managing Sovereign Risk"

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> "Can the current course of fiscal policy be sustained, without exploding debt? Or will the government have to sharply increase taxes, decrease spending, have recourse to monetisation, or even repudation?" [O.J. Blanchard, 1990]

1. Public-Debt Dynamics in an Open Economy

$$d_t = \frac{1 + i_t}{(1 + g_t)(1 + \pi_t)} d_{t-1} - b_t \tag{1}$$

$$i_t = \underbrace{[(1 - \alpha^f) i_t^h + \alpha^f i_t^f]}_{\hat{i}} + \varepsilon_t \alpha^f (1 + i_t^f), \quad \varepsilon_t = \Delta e_t / e_{t-1} \tag{2}$$

$$\pi_t = \underbrace{[(1 - \beta^f) \pi_t^h + \beta^f \pi_t^f]}_{\hat{\pi}_t} + \varepsilon_t \beta^f (1 + \pi_t^f) \tag{3}$$

These equations can be combined to obtain the law of motion of the debt-to-GDP ratio:

$$d_t = \frac{1 + \hat{i}_t + \varepsilon_t \alpha^f (1 + i_t^f)}{(1 + g_t)[1 + \hat{\pi}_t + \varepsilon_t \beta^f (1 + \pi_t^f)]} d_{t-1} - b_t \tag{4}$$

2. DSA

- While equation (4) must always hold *ex-post*, the challengue of DSA is to perform **forward analysis**.

- Problem: **uncertainty** —*i.e.*, model uncertainty, parameter uncertainty, shocks, etc.

$$\Phi(\{i_t^f, i_t^h, g_t, \pi_t^f, \pi_t^h, e_t, b_t, d_t, \ldots\ldots\}_{t=0}^{\infty}) = \{\epsilon_t\}_{t=0}^{\infty} \qquad (5)$$

- **Short-term:** Hopeless —*e.g.*, uncertainty about g is about half the order of magnitude of g.

- **Answer:** interpret quantities in (4) as medium-term averages, *e.g.*, over a five- or ten-year horizon, and see what would happen to d under a reasonable constellation of values of RHS variables.

  ⋆ **Sensitivity:** response of d to changes in RHS variables.

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3. Discussion of Papers Presented—from a DSA perspective

- Mendoza & Oviedo (2006): Model for a small open economy; can be reformulated into a single objective function for households:

$$E_0 \left\{ \sum_t (\beta\gamma^{1-\sigma})^t \frac{\eta g_t^{1-\sigma} + (1-\eta)c_t^{1-\sigma}}{1-\sigma} \right\}$$

- The 'government' now devoid of an objective function, becomes an institution/technology with the ability of (optimally) providing g subject to (1b) —taking the households' optimal plans as given. Households, taking the 'government process' as given, then maximize the remainder.
- The source of the inefficiency is the *segmentation* of the economy-wide constraint into (1b) and (2b) —*i.e.*, "inadequate tax/debt technology."
    - ⋆ This induces procyclical fiscal policy by a benevolent government.
- In this model d is endogenously determined, but the (simple) model is not designed for DSA.

- Silva, Cabral & Baghdassarian (2006) & Barnhill (2006):
  - ⋆ Stochastic simulation methods → rvariables
  - ⋆ Distribution of outcomes, *e.g.*, for d

- Pros: mapping from joint distribution of rvariables to outcomes, acknowledges uncertainty.

- Cons:

  - ⋆ Given the low-frequency of the data (annual) and the changing economic environment (including financial innovations), the observed empirical frequencies may not be too good making inferences about future constellations of the variables of interest —*i.e.*, for drawing the rvariables.

  - ⋆ Quality of Input → Quality of Output

  - ⋆ Methodological: should iid annual draws be made (*e.g.*, for deviations from trend) or serially-correlated draws?

  - ⋆ Mean-Variance analysis not appropriate for some loss functions — *e.g.*, Linex.

4. References

[1] Barnhill, T.M. (2006), "Modeling and Managing Sovereign Risk in a Jumpy World"

[2] Celasun, Oya, X. Debrun, and J.D. Ostry (2006), "Primary Surplus Behavior and Risks to Fiscal Sustainability in Emerging Market Countries: A 'Fan-Chart' Approach," available at:
`http://www.imf.org/external/pubs/cat/longres.cfm?sk=18930.0`

[3] Ley, E. (2005), "Fiscal (and External) Sustainability," available at:
`http://econwpa.wustl.edu/eprints/pe/papers/0310/0310007.abs`

[4] Mendoza, E.G. and P.M. Oviedo (2006), "Fiscal Policy and Macroeconomic Uncertainty in Emerging Markets: The Tale of the Tormented Insurer"

[5] Silva, A., R. Cabral and W. Baghdassarian (2006), "Scope and Fundamental Challenges to Public Debt Risk Management: The Brazilian DMO Perspective"