Public Debt Sustainability

Conference ‘Sovereign Debt: A Guide for Economists and Practitioners’

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Introduction (i)
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Introduction (ii)

• How is it possible that some governments continue to service debt >200% of GDP, while others default at levels <30%?

• When is debt sustainable?

• Theory tends to equate ‘debt sustainability’ with ‘solvency’
  • But solvency doesn’t seem to be sufficient to guarantee sustainability...
    • At the same time, sustainability ⇒ solvency
  • Still, solvency yields a useful starting point
Solvency

• Government’s period $t$ budget constraint:

$$G_t + (1 + r_t)D_{t-1} = T_t + D_t$$

• Defining the primary deficit $P_t \equiv G_t - T_t$:

$$D_t = (1 + r_t)D_{t-1} + P_t \Leftrightarrow D_t = \frac{1}{1 + r_t} (D_{t+1} - P_{t+1}) \quad (1)$$

• Solving (1) forward:

$$D_t = - \sum_{j=1}^{\infty} \prod_{k=1}^{j} \frac{1}{1 + r_{t+k}} P_{t+j} + \lim_{T \to \infty} \prod_{j=1}^{T} \frac{1}{1 + r_{t+j}} D_{t+T}$$
Solvency

• Government’s period $t$ budget constraint:

$$G_t + (1 + r_t)D_{t-1} = T_t + D_t$$

• Defining the primary deficit $P_t \equiv G_t - T_t$:

$$D_t = (1 + r_t)D_{t-1} + P_t \iff D_t = \frac{1}{1 + r_t} (D_{t+1} - P_{t+1}) \quad (1)$$

• Solving (1) forward:

$$D_t = - \sum_{j=1}^{\infty} \prod_{k=1}^{j} \frac{1}{1 + r_{t+k}} P_{t+j}$$

• Solvency: current debt stock is matched by the PDV of future primary surpluses

• Is always satisfied ex-post (possibly via inflation, financial repression, or default)
  • What is deemed acceptable to continue to speak of ex-ante solvency/sustainability?
Operational difficulties with solvency

• Solvency is forward-looking, while tests are backward-looking
  • Real question: are the government’s future plans credible?

• Market beliefs can cause liquidity crises
  • Complicated world of multiple equilibria, where solvency $\not\rightarrow$ sustainability

• Concept assumes that governments are committed to repaying, while they might not want to do so...
  • Need for a strategic angle if one wants to assess credit risk
From solvency to sustainability (i)

• Bohn (1998) showed that the solvency condition can be tested for by checking whether the primary balance $PB$ responds to lagged debt:

$$PB_t = \beta_0 + \beta_1 \tilde{G}_t + \beta_2 \tilde{Y}_t + \rho D_{t-1} + \varepsilon_t$$

• I.e.: $\hat{\rho} > 0$.

• Practical difficulties:
  • Backward-looking, long-run perspective: what if $\rho$ occasionally switches sign?
  • Abstracts from liquidity considerations
  • Does not rule out uncomfortably high debt levels
    • Does not put an upper-bound on primary balances needed
    • Ostry et al. (2010) and Ghosh et al. (2013): “fiscal fatigue”
From solvency to sustainability (ii)

\[ p_b, r \cdot d \]

fiscal reaction function

interest bill

\[ r_{rf} \]
From solvency to sustainability (iii)

• Sustainability not only requires solvency (through credible policies), but also absence of liquidity issues

• Hard to capture in one encompassing framework, especially as the pure theoretical concept involves the infinite future
  • Pragmatism leads to analyzing medium-term projections for debt (service) indicators, taking account of institutional factors
    • Sustainability ⇒ solvency
  • Model-based insights can still be useful
A practical way forward

• Combine debt dynamics equations with economic projections to analyze trajectories for debt (service) indicators going forward

• Debt sustainability should rule out explosive debt trajectories
  • Imposes a condition that is stricter than Bohn’s (‘ρ > 0’)
  • Are the required primary balances realistic/feasible?
  • Upper-bound on feasible primary balances leads to a debt limit
    • Empirical analysis (even though backward-looking) can guide our judgement
  • Need to reflect the fact that the future is uncertain
    • Stress tests
    • Fan charts
    • Analysis of the government’s balance sheet
Remaining difficulties

• Accounting for liquidity remains important
  • Can make projections for debt service indicators...
  • ... but it’s very hard to foresee future mood swings in sovereign bond holders

• Countries with sustainable debt might default too
  • Cost-benefit analysis (Eaton and Gersovitz, 1981)
  • Rating agencies often take default histories into account
    • Some countries are more ‘debt intolerant’ than others (Reinhart, Rogoff, and Savastano, 2003)
    • Past defaults may lower the costs of future defaults
Conclusion

• DSA is hard
  • Theoretical anchor (‘solvency’) doesn’t impose a lot of constraints
  • Empirical tests are of limited value, as they are backward-looking
  • Have to settle for arbitrary sufficient conditions

• Must rely on ad-hoc approaches with a medium-term focus
  • Preferably model-based and stochastic

• Future is bright(er), as data accumulates
  • Challenge: maintain transparency and communicability