

Is public debt sustainable?

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Abstract

Fiscal reaction functions and Bohn's test, the r -less-than- g argument of Blanchard, the 90 percent threshold and its spreadsheet, and why the answer depends on the interest rate the market has not yet set.

“Sustainable” is not a number. A debt ratio is sustainable if the government's behaviour is expected to satisfy the intertemporal constraint from The government budget constraint and debt dynamics without a change of regime: no default, no surprise inflation, no forced adjustment. That makes sustainability a statement about future behaviour, which is why the tests are statistical and the debate never ends.

Bohn's test

Bohn asked a simple question of two centuries of US data: when debt rises, does the primary surplus rise with it? He estimated a **fiscal reaction function**

$$s_t = \rho b_{t-1} + \alpha (\text{temporary spending}) + \beta (\text{cyclical output}) + \varepsilon_t,$$

and showed that a positive ρ , however small, is sufficient for the intertemporal constraint to hold: a government that leans against its debt even a little cannot be running a Ponzi scheme. For the United States he found ρ around 0.03 to 0.05, significantly positive (Bohn, 1998). The appeal is that the test needs no assumption about future interest rates; the weakness is that it measures the past. A reaction that held for two hundred years can still stop.

Definition 1 (Fiscal reaction function). The systematic response of the primary balance to the inherited debt ratio, after controlling for the business cycle and temporary spending such as wars. A positive slope is the empirical meaning of “the government reacts to its debt”.

The 90 percent threshold

Reinhart and Rogoff reported that advanced economies with debt above 90 percent of GDP grew about one percentage point slower than the rest, and the number entered the austerity debates of 2010 (Reinhart & Rogoff, 2010). Herndon, Ash and Pollin then replicated the calculation and found a spreadsheet error, selective exclusion of years, and an unweighted averaging scheme; with those corrected, high-debt countries grew about 2.2 percent rather than the reported -0.1 percent, and the threshold disappeared (Herndon et al., 2014). Two lessons survived: correlation between debt and growth runs in both directions, since slow growth raises debt ratios mechanically, and a single threshold is not a policy rule.

Blanchard: r below g

In his 2019 presidential address, Blanchard observed that the safe interest rate has been below the growth rate in the United States for most of the post-war period, and argued that this changes the arithmetic of debt: with $r < g$ the government can roll over its debt without ever raising taxes, and the welfare cost of debt, which works through crowding out of capital, is small when the return on capital is low relative to

growth (Blanchard, 2019). The argument is careful about its own limits. It is about the *average* rate; it holds as long as r stays below g ; and higher debt itself pushes r up.

Mehrotra and Sergeyev quantified the point in a model where $r < g$ arises from a demand for safe assets: debt can be rolled over on average, but the ratio still follows a random walk with drift, and a run of years with $r > g$ can push it to levels where the premium on safety erodes (Mehrotra & Sergeyev, 2021). Furman and Summers proposed replacing debt-ratio targets with a ceiling on real interest payments as a share of GDP, on the ground that the cost of debt, not its stock, is what constrains a government (Furman & Summers, 2020).

When r is not given

The intertemporal constraint takes r as given, but the rate a government pays depends on how much investors trust it to satisfy the constraint. Calvo showed that this can produce two equilibria for the same fundamentals: a low rate at which the debt is easily served, and a high rate at which the burden of servicing makes default rational, so the high rate is self-confirming (Calvo, 1988). Sustainability can then be lost without any change in fundamentals; the euro area supplied the case study, covered in Sovereign debt and the euro area.

A practical reading

Debt sustainability analysis in the IMF's or the European Commission's sense combines these ingredients: a projected path for the primary balance, assumptions about r and g with fan charts around them, and a judgement about the gross financing need, the amount to be rolled over each year. The identity supplies the arithmetic; the judgement is about behaviour and about the rate that behaviour will earn.

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