

Fiscal Policy and Public Debt

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Debt dynamics and the r minus g arithmetic, sustainability tests, fiscal multipliers, optimal debt, monetary-fiscal interaction and the fiscal theory of the price level, the euro-area crisis, fiscal rules including the Swiss debt brake, and the decade after 2020. Eight lessons with flashcards and references.

The government budget constraint and debt dynamics

How the debt ratio moves with the primary balance, the interest rate and growth; the r minus g arithmetic that organises every fiscal debate.

Every question in this course, from multipliers to the euro crisis, comes back to one identity. The government finances what it does not raise in taxes by borrowing, and what it borrowed yesterday costs interest today. Written carefully, that identity tells you what “sustainable” can mean, why a country can run deficits forever, and why the same deficit is harmless at one interest rate and dangerous at another.

The flow identity

Let B_t be nominal debt at the end of year t , i_t the average nominal interest rate paid on it, G_t spending excluding interest, and T_t revenue. Then

$$B_t = (1 + i_t) B_{t-1} + G_t - T_t.$$

The difference $G_t - T_t$ is the **primary deficit**: what the state spends on everything but debt service, minus what it collects. Interest is kept apart because it is inherited, not chosen this year.

Ratios to GDP

Nobody reasons about debt in francs or euros; what matters is debt relative to the tax base, and the natural proxy for the tax base is nominal GDP Y_t . Divide equation () by Y_t and write $b_t = B_t/Y_t$, $d_t = (G_t - T_t)/Y_t$, and nominal growth $\gamma_t = Y_t/Y_{t-1} - 1$:

$$b_t = \frac{1 + i_t}{1 + \gamma_t} b_{t-1} + d_t \approx b_{t-1} + (r_t - g_t) b_{t-1} + d_t,$$

where r is the real interest rate and g real growth (inflation cancels to first order). Equation () is the workhorse. The change in the debt ratio has two parts: the primary deficit, and the **snowball effect** $(r - g) b_{t-1}$, the interest bill net of the erosion that growth provides.

Definition 1 (Debt-stabilising primary balance). The primary surplus that keeps the debt ratio constant: setting $b_t = b_{t-1} = b$ in () gives $-d = (r - g) b$, so the required primary surplus is $s^* = (r - g) b$. With $r > g$ a positive surplus is needed; with $r < g$ the ratio falls even with a small primary deficit.

Two numbers make the point. A country with debt at 100 percent of GDP and $r - g = 2$ percentage points must run a primary surplus of 2 percent of GDP every year just to stand still. The same country with $r - g = -1$ can run a primary deficit of 1 percent of GDP and watch the ratio drift down.

The intertemporal constraint

Iterate () forward and, provided $r > g$, the debt ratio today equals the present value of future primary surpluses:

$$b_{t-1} = \sum_{k=0}^{\infty} \left(\frac{1+g}{1+r} \right)^{k+1} s_{t+k} + \lim_{K \rightarrow \infty} \left(\frac{1+g}{1+r} \right)^K b_{t+K}.$$

The last term is the **transversality condition**: if it is zero, debt is eventually paid down by surpluses; if it is not, the government is rolling over debt and interest forever, a Ponzi scheme. When $r < g$ the discount factor exceeds one and the sum need not converge, which is exactly why the sign of $r - g$ dominates the sustainability debate in Is public debt sustainable?.

What the identity does not say

The identity is an accounting statement, not a theory. It says nothing about which r the market will charge, which depends on how much debt investors are willing to hold at a given yield, and it says nothing about g , which fiscal policy itself affects. Hall and Sargent decomposed the post-war fall in the US debt ratio and found that growth and the real rate, not primary surpluses, did most of the work (Hall & Sargent, 2011). That is the empirical face of the snowball term. The lessons that follow fill in the behaviour: how surpluses respond to debt, what spending does to output, and what happens when the central bank and the treasury do not agree about who adjusts.

Is public debt sustainable?

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 2 (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 (O. 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.

Fiscal multipliers

What one unit of government spending does to output in the textbook, in New Keynesian models at the lower bound, and in the data from wars, forecast errors and US states.

The multiplier is the answer to the question a finance minister asks first: if we spend one more franc, by how much does GDP change? The theoretical range runs from below zero to above two, and the empirical literature has narrowed it considerably, though only after learning which experiment it was measuring.

Definition 3 (Spending multiplier). The change in output per unit change in government purchases, $\Delta Y / \Delta G$, over a stated horizon. The cumulative multiplier divides the integral of the output response by the integral of the spending response, which is the version to compare across studies.

What theory says

In the neoclassical benchmark, government spending crowds out private consumption through a negative wealth effect on households and raises labour supply, so output rises by less than spending and the multiplier lies between zero and one. In a New Keynesian model with sticky prices and a central bank that follows a Taylor rule, the multiplier is close to one: demand rises, but the central bank leans against it. Woodford's exposition shows how the answer hinges on the monetary response (Woodford, 2011).

The response is what changes at the effective lower bound. If the central bank cannot raise rates, higher spending raises expected inflation, lowers the real rate, and stimulates private demand on top of the direct effect. Christiano, Eichenbaum and Rebelo showed that multipliers above two arise in a standard model when the lower bound binds and the spending is expected to last as long as the bound does (Christiano et al., 2011). The same mechanism cuts the other way: consolidation at the lower bound is unusually costly.

Three ways to measure it

Military spending. Wars change government purchases for reasons unrelated to the business cycle. Ramey and Zubairy built a quarterly US series back to 1889 and estimated state-dependent multipliers with local projections; they found multipliers between 0.6 and 1 in most states of the economy and no strong evidence of larger multipliers in slumps, though somewhat larger ones when the lower bound binds (Ramey & Zubairy, 2018). Auerbach and Gorodnichenko, using a regime-switching VAR on post-war data, had found much larger multipliers in recessions, around 1.5 to 2, than in expansions (Auerbach & Gorodnichenko, 2012); the two papers differ in identification and in how the regime is defined, and the disagreement is instructive rather than resolved.

Forecast errors. Blanchard and Leigh noticed that in 2010 to 2011 the countries that consolidated most had the largest negative growth surprises relative to IMF forecasts. Since the forecasts already embodied a multiplier of about 0.5, the systematic errors implied that actual multipliers at the time were above one (O. J. Blanchard & Leigh, 2013).

Cross-sectional evidence. Nakamura and Steinsson exploited the fact that US military build-ups hit states differently. A state that receives one dollar more of spending than the average sees output rise by about 1.5 dollars. This is an **open-economy relative multiplier**: it nets out the national monetary and tax response, and in a model it maps into an aggregate multiplier well above one when monetary policy does not react (Nakamura & Steinsson, 2014).

Reading the evidence

Ramey's survey of the decade after the financial crisis draws the lines: aggregate spending multipliers are most plausibly between 0.6 and 1 in normal times, larger at the lower bound or when policy is accommodative; tax multipliers, identified with narrative records of legislated changes, are often larger than spending multipliers; and the transfer multiplier depends on who receives the money (Ramey, 2019). The cross-sectional and the aggregate numbers are answers to different questions and should not be averaged.

Multipliers and debt

The multiplier feeds straight back into The government budget constraint and debt dynamics. With a multiplier m and a tax share τ , one unit of spending raises revenue by τm ; the deficit rises by $1 - \tau m$. With $m = 1.5$ and $\tau = 0.4$ the deficit rises by 0.4, and if the spending also prevents a persistent loss of output, the debt *ratio* can fall. That is the arithmetic behind the claim that consolidation at the wrong moment can raise the debt ratio it was meant to reduce, and behind the case for Fiscal rules and the Swiss debt brake that let the automatic stabilisers work.

Tax smoothing and the optimal level of debt

Barro's case for deficits in wars and recessions, the Lucas-Stokey view of debt as insurance, and Aiyagari and McGrattan's estimate of how much debt a precautionary economy wants.

The identity in The government budget constraint and debt dynamics tells you what a debt path costs, not which path to choose. The normative literature starts from a different question: given that taxes distort, how should a government spread them over time, and what level of debt follows from the answer?

Barro: keep tax rates flat

Barro's argument is a direct analogue of consumption smoothing. Distortionary taxes create deadweight losses that rise more than proportionally with the tax rate, so for a given present value of revenue the loss is minimised by keeping the rate constant over time. A war or a recession that temporarily raises spending or lowers the tax base should therefore be financed by borrowing, and the debt repaid slowly through a permanently slightly higher rate. The prediction is that tax rates follow a random walk and that deficits are counter-cyclical, and Barro found both in US data from 1917 to 1976 (Barro, 1979).

Theorem 1 (Tax smoothing). *If the deadweight loss of taxation is convex in the tax rate and the government can borrow at the market rate, the optimal policy equalises expected marginal deadweight loss across periods, which under quadratic loss means a constant expected tax rate. Debt absorbs temporary shocks to spending and the tax base.*

The implication for debt is modest: its *level* is whatever history left, and only its *changes* are pinned down. Barro's government is indifferent between debt at 30 or 90 percent of GDP as long as it smooths from there. That indifference is the first thing the later literature removes.

Lucas and Stokey: debt as state-contingent insurance

Lucas and Stokey reformulated the problem with complete markets. If the government could issue securities whose payoff depends on the state, it would insure itself against spending shocks: debt would pay less when war breaks out and more in peace, and tax rates would move with the state rather than with the history of shocks (Lucas & Stokey, 1983). Real governments cannot write such contracts explicitly, but nominal debt is a partial substitute: unexpected inflation lowers the real value of outstanding nominal bonds, a state-contingent capital levy on bondholders. The war and post-war inflations that Hall and Sargent found in their decomposition are this mechanism at work (Hall & Sargent, 2011), and it reappears as a conflict rather than a policy in Monetary and fiscal interaction.

Aiyagari and McGrattan: how much debt does an economy want?

With incomplete markets on the household side the level of debt matters. Households facing uninsurable income risk hold precautionary savings; government bonds give them a safe asset to hold, which is a benefit, and the taxes that service the debt distort labour supply and crowd out capital, which is a cost. Aiyagari and McGrattan computed the trade-off in a calibrated model and found an optimal US debt ratio of about two thirds of GDP, close to the actual post-war average, with a welfare surface so flat that moving debt anywhere between zero and one hundred percent of GDP changed welfare by hundredths of a percent of consumption (Aiyagari & McGrattan, 1998). The flatness is the message: within a wide range, the level of debt is a second-order question compared with how taxes are set and how shocks are absorbed.

What the low-rate decade added

The safe-asset view sharpened after 2010. If private agents value the liquidity and safety of government bonds, the government earns a **convenience yield**: it borrows below the marginal product of capital, and part of the interest cost is offset by a service the bond provides. This is one reading of $r < g$ in Is public debt sustainable?, and it makes public debt closer to money than to a loan: the state supplies a scarce asset and collects seigniorage on it. The reading also carries the same warning as money: the yield exists only as long as the asset stays safe.

Putting the pieces together

Three principles survive across models. Finance temporary shocks by borrowing, not by tax spikes. Do not expect a large welfare gain from moving the debt level within the ordinary range. And remember that the level does matter at the edges, where the safe-asset premium can vanish and the self-fulfilling equilibria of Sovereign debt and the euro area become possible. Fiscal rules, the subject of a later lesson, are an attempt to write the first two principles into law without triggering the third.

Monetary and fiscal interaction

Unpleasant monetarist arithmetic, Leeper's active and passive regimes, the fiscal theory of the price level, and the fiscal reading of the 2021 inflation.

Two authorities share one budget constraint. The treasury sets primary balances, the central bank sets the interest rate and, through it, the interest bill and the inflation that erodes nominal debt. The identity from The government budget constraint and debt dynamics must hold in every equilibrium, so at least one of the two must adjust. Which one does is the regime question, and it determines whether the central bank controls inflation.

Unpleasant arithmetic

Sargent and Wallace made the point with a thought experiment. A central bank tightens today while the treasury keeps its deficits. Debt grows faster than the economy, and if the public knows that at some date the central bank will have to monetise the debt, expected inflation rises now. A tightening can therefore raise inflation, even today, when the fiscal authority does not follow (Sargent & Wallace, 1981). The result requires an upper bound on debt the public believes in, and $r > g$; it is the first formal statement that monetary policy without fiscal backing cannot deliver price stability.

Leeper: active and passive

Leeper wrote both policies as rules and asked which combinations give a unique stable equilibrium. Monetary policy is **active** if it raises the interest rate more than one for one with inflation (the Taylor principle) and **passive** otherwise; fiscal policy is passive if it raises the primary surplus enough in response to debt to keep it bounded, and active if it does not. Two regimes work: active money with passive fiscal, the textbook case in which the central bank pins down inflation and the treasury pays its bills; and passive money with active fiscal, in which the treasury does not react to debt and the price level must adjust to make the real value of debt equal to the surpluses that will be paid (Leeper, 1991). Both active is explosive; both passive leaves the price level indeterminate.

Definition 4 (Fiscal dominance). The regime in which fiscal policy is active and monetary policy passive: surpluses do not respond to debt, the central bank keeps the interest rate from rising enough to threaten solvency, and inflation is whatever balances the government's intertemporal budget. Sargent and Wallace's thought experiment ends in this regime.

The fiscal theory of the price level

Sims and Woodford turned the passive-money regime into a theory of price determination. In the government's intertemporal constraint, nominal debt B divided by the price level P must equal the present value of real primary surpluses:

$$\frac{B_{t-1}}{P_t} = \sum_{k=0}^{\infty} \beta^k \mathbb{E}_t s_{t+k}.$$

Read as an equilibrium condition rather than a constraint on the treasury, it says that if the public expects lower surpluses, the price level must rise so that the real value of debt falls to match; nominal government debt is priced like a claim on surpluses, as equity is priced on dividends (Sims, 1994; Woodford, 2001). Cochrane's book develops this into a full account in which the interest rate rule still matters for the *path* of inflation while the fiscal backing determines its *level* (Cochrane, 2023). The theory is contested on whether the equation is a constraint or a valuation, but its empirical claim, that fiscal news moves inflation when it is not expected to be paid for, is now testable.

2021 as a test

Bianchi, Faccini and Melosi built a model with both regimes and let the data say which one financed each shock. They found that the pandemic transfers of 2020 and 2021 in the United States were largely perceived as unfunded, not to be repaid by future surpluses, and that this fiscal component explains a substantial share of the rise and the persistence of inflation in 2021 and 2022, a share that monetary tightening alone could not remove (Bianchi et al., 2023). Whether one accepts the decomposition or not, the episode revived the question of the 1980s: what does the treasury commit to when the central bank raises rates on a large stock of debt?

Reading the balance sheet across the table

The interaction runs in both directions. When the central bank holds long-term bonds financed by reserves, as after quantitative easing, rate rises produce central bank losses and smaller remittances to the treasury; the consolidated government has shortened the maturity of its debt, and the interest bill responds faster to policy. The lesson on the balance sheet in the Unconventional Monetary Policy course covers the mechanics; here the point is that “independence” is an arrangement about who adjusts, and the arrangement is tested precisely when debt is high, as in Fiscal policy after 2020.

Sovereign debt and the euro area

Why a country that borrows in a currency it does not control can face a self-fulfilling run, the doom loop between banks and sovereigns, and what “whatever it takes” changed.

Between 2010 and 2012 Greece, Ireland, Portugal, Spain and Italy paid interest rates that made the arithmetic of The government budget constraint and debt dynamics explosive, then, after a single sentence from the ECB, paid rates that made it benign. Nothing about their fundamentals changed in the week of that sentence. The episode is the clearest demonstration of the multiple-equilibrium logic introduced in Is public debt sustainable?.

Borrowing in a currency you do not issue

A government that borrows in its own currency can always meet a nominal payment: the central bank can create the money, at the cost of inflation. A euro-area member cannot. De Grauwe argued that this makes euro-area members like emerging economies borrowing in dollars: if investors fear default, they sell the bonds, yields rise, the liquidity shortage becomes a solvency problem, and the fear confirms itself. A country with the same debt ratio but its own central bank, the United Kingdom in 2011, paid far lower rates than Spain (De Grauwe, 2011). De Grauwe and Ji later tested the claim and found that the spreads of 2010 to 2012 were far above what fundamentals could explain, and that they collapsed after the ECB’s announcement without any change in those fundamentals (De Grauwe & Ji, 2013).

Definition 5 (Self-fulfilling sovereign debt crisis). An equilibrium in which investors’ expectation of default raises the interest rate to a level at which default becomes optimal, confirming the expectation. It exists only when a lender of last resort is absent or not credible; the same fundamentals also support a low-rate equilibrium.

The diabolic loop

Lane’s account of the crisis adds the second mechanism. Euro-area banks held large amounts of their own government’s bonds. When sovereign yields rose, bank capital fell; weak banks needed public support, which raised sovereign debt; and the rising debt pushed yields up further. Ireland entered the loop from the bank side, with a guarantee of bank liabilities in 2008 that turned private losses into public debt; Greece entered from the sovereign side (Lane, 2012). Brunnermeier and co-authors named the mechanism the diabolic loop and proposed to break it by having banks hold a pooled, tranching European safe asset instead of home sovereign bonds (Brunnermeier et al., 2016).

Whatever it takes

On 26 July 2012 Mario Draghi said that the ECB was ready to do “whatever it takes” to preserve the euro (Draghi, 2012), and in September the ECB announced Outright Monetary Transactions: unlimited purchases of the bonds of a country under a conditional programme. Not one bond was bought under OMT. The announcement alone moved the euro area from the bad equilibrium to the good one, which is what a lender of last resort does: by being willing to lend, it removes the reason to run. The ECB’s Transmission Protection Instrument of 2022 restated the commitment for the tightening cycle, with the same design of conditional, unannounced-size purchases.

Austerity

The consolidation programmes of 2010 to 2014 became the largest natural experiment on the multipliers of Fiscal multipliers. Alesina, Favero and Giavazzi assembled narrative plans for sixteen countries and found that spending-based consolidations were much less costly in output than tax-based ones, and sometimes nearly costless, while tax-based plans produced long recessions (Alesina et al., 2019). Blanchard and Leigh’s forecast-error evidence pointed to multipliers above one during the same years (O. J. Blanchard & Leigh, 2013). The two findings are reconcilable: composition matters, and so does the moment. A consolidation in a monetary union at the lower bound, with the partner countries consolidating at the same time, is the worst case for both.

What the episode settled

Three things. A monetary union needs a lender of last resort for governments, or its members carry a default risk their fundamentals do not justify. Banks and sovereigns must be separated, which the banking union has done only partly. And fiscal rules that force pro-cyclical consolidation deepen the recession they respond to; the redesign of those rules is the subject of Fiscal rules and the Swiss debt brake.

Fiscal rules and the Swiss debt brake

Why governments tie their own hands, how the Swiss debt brake works and what it has done since 2003, and the 2024 reform of the European rules.

Tax smoothing says borrow in bad times and repay in good ones. Politics tends to deliver the first half. A **fiscal rule** is a constraint written in advance, in a constitution, a law or a treaty, that forces the second half. This lesson asks why rules exist, what a good one looks like, and how the Swiss version, the most durable of them, has performed.

Why rules

Yared reviews the decades-long rise of government debt across advanced economies and finds that the usual explanations, wars and recessions, cannot account for a trend that persists in peace and expansions. The persistent drivers are political: governments that may not be in office tomorrow discount the future, ageing electorates favour spending on themselves, and each coalition partner treats the common budget as a common pool (Yared, 2019). Halac and Yared model the resulting trade-off: a rule that binds removes the deficit bias but also removes the flexibility to respond to shocks the rule-writer did not foresee, so the optimal rule is a ceiling with escape clauses rather than a fixed number (Halac & Yared, 2014).

Definition 6 (Fiscal rule). A numerical constraint on a budget aggregate, such as the deficit, the debt ratio, spending growth or the structural balance, that is fixed for a term longer than one budget and cannot be changed by the government it binds without a super-majority or a constitutional step.

The Swiss debt brake

Switzerland adopted the *Schuldenbremse* by referendum in 2001 with 85 percent in favour, and it has applied to the federal budget since 2003 (Article 126 of the Federal Constitution). Its design solves the problem

that a balanced-budget rule is pro-cyclical. The rule limits *expenditure* to expected *receipts* adjusted for the business cycle:

$$\text{Expenditure ceiling}_t = k_t \times \text{Receipts}_t, \quad k_t = \frac{Y_t^{\text{trend}}}{Y_t},$$

so the ceiling rises above receipts in a recession, when trend output exceeds actual output, and falls below them in a boom. The budget is balanced over the cycle, not every year. Deviations are booked to a compensation account: overruns must be repaid in later years, and shortfalls of the account beyond a threshold trigger mandatory cuts. Extraordinary spending, such as the pandemic programmes of 2020 and 2021, can be authorised by a qualified majority and is booked to a separate amortisation account with its own repayment schedule.

The record is unusual. Federal debt fell from about 26 percent of GDP in 2003 to about 14 percent before the pandemic, and the rule survived the financial crisis, the franc shock of 2015 and the pandemic without suspension. Beljean and Geier attribute the outcome to the cyclical adjustment and to the automatic correction mechanism, and note the side effects: systematic revenue under-forecasting produced surpluses beyond the rule's intent, and the rule constrains investment along with consumption (Beljean & Geier, 2013). The debate since 2020 is about exactly those side effects: whether a country with $r < g$ and a debt ratio below 20 percent should amortise pandemic debt at all, and whether the rule should distinguish investment from current spending.

The European rules

The Maastricht criteria fixed a deficit ceiling of 3 percent and a debt reference of 60 percent of GDP; the Stability and Growth Pact added a correction procedure. The pact has been suspended, reformed and circumvented repeatedly, and its enforcement in 2003 against Germany and France failed at the first test. The rules were pro-cyclical in 2011 to 2013, when they demanded consolidation from countries already in recession, the episode of Sovereign debt and the euro area. The 2024 reform replaced the annual deficit targets with country-specific medium-term paths for net primary expenditure, negotiated over four to seven years, with the 3 and 60 percent references retained as safeguards (Council of the European Union, 2024). Expenditure paths are closer to the Swiss design: they let revenue fluctuate with the cycle and constrain the variable the government controls.

What makes a rule work

Three features distinguish rules that have held from rules that were abandoned. They constrain spending or the structural balance, not the headline deficit, so the automatic stabilisers of Fiscal multipliers can operate. They have an explicit escape clause with a defined return path, so a crisis does not require breaking the rule. And they have a correction mechanism that operates without a new political decision. Constitutional rank and a referendum behind it help, but the Swiss experience suggests the arithmetic of the rule matters more than the rank of the law.

Fiscal policy after 2020

The pandemic packages, the inflation that followed, interest bills rising on high debt, and the questions the decade leaves open for r minus g , rules and central bank independence.

The pandemic produced the largest peacetime fiscal expansion in the advanced economies, followed within a year by the largest inflation in forty years and, within two, by the fastest tightening. Every lesson of this course was tested at once. This last lesson reads the episode through them and lists what remains open.

The expansion

Discretionary fiscal support in 2020 and 2021 reached roughly a quarter of GDP in the United States and between 10 and 20 percent in most of Europe, through transfers to households, wage subsidies, loan guarantees

and grants to firms. Debt ratios rose by 15 to 25 points in a year. In the arithmetic of The government budget constraint and debt dynamics this was financed almost entirely at $r < g$: nominal rates near zero and, from 2021, nominal growth above 8 percent from the combination of recovery and inflation. By 2023 debt ratios in most countries were back near or below their 2020 peak despite continued primary deficits, the snowball effect running in reverse.

The inflation

The size of the US package relative to the output gap became the central dispute of 2021. The demand-side reading, argued by Summers and Blanchard before the fact, was that transfers of that size into an economy with constrained supply would produce inflation; the monetary-fiscal reading of Monetary and fiscal interaction adds that transfers perceived as unfunded raise the price level directly (Bianchi et al., 2023). The supply-side reading points to energy and shipping shocks that hit Europe, with smaller packages, at least as hard. The evidence supports a mixture with different weights across countries: the US inflation had a larger demand component, the European one a larger energy component, and the persistence in both had a fiscal element that the multipliers of Fiscal multipliers at the lower bound would have predicted.

The interest bill

The tightening of 2022 and 2023 ended the free lunch. With policy rates at 4 to 5 percent, net interest payments in the United States rose above 3 percent of GDP in 2024, exceeding defence spending, and the Congressional Budget Office projects them to keep rising. Two features of the previous decade made the bill respond quickly: the shortening of effective maturity by central bank purchases, discussed in the previous course, and the reliance of some treasuries on short bills. Blanchard's 2023 reassessment keeps the conclusion that debt is not the emergency it was made out to be, but drops the assumption that $r < g$ is permanent: the safe rate is a variable, and a fiscal plan must be robust to its rising (O. Blanchard, 2023).

Definition 7 (Gross financing need). The amount a government must borrow in a year: the deficit plus the debt maturing that year. It measures exposure to a change in market conditions better than the debt ratio does, since a country with long maturities can wait out a high-rate episode and a country with short ones cannot.

Rules and independence

The escape clauses of Fiscal rules and the Swiss debt brake were used everywhere and, in Switzerland and the European Union, the return paths were followed or renegotiated rather than abandoned. The harder question is the one Sargent and Wallace asked: when debt is high and the central bank raises rates, does the public believe that the treasury will adjust? The 2022 gilt episode in the United Kingdom, in which an unfunded tax cut announcement produced a bond sell-off severe enough to require central bank intervention within days, showed that the answer can change within a week, and that the market enforces fiscal backing faster than any rule.

Open questions

- Is $r < g$ the normal state of a safe-asset economy, or a thirty-year episode that ended in 2022? The answer sets the required primary balance for every country.
- Should fiscal rules exempt public investment, as the debates on the Swiss debt brake and the EU expenditure paths propose, and can “investment” be defined tightly enough to prevent relabelling?
- How should the consolidated government manage the maturity of its debt when the central bank's balance sheet is part of it?
- Can a monetary union have a lender of last resort for governments without a fiscal union, or is the conditionality of OMT and TPI the permanent compromise?

None of these is settled. The tools to think about them are the identity of the first lesson, the reaction functions of the second, the multipliers of the third, and the regime question of the fifth.

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